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FULLER ALBRIGHT

*1900—1969*

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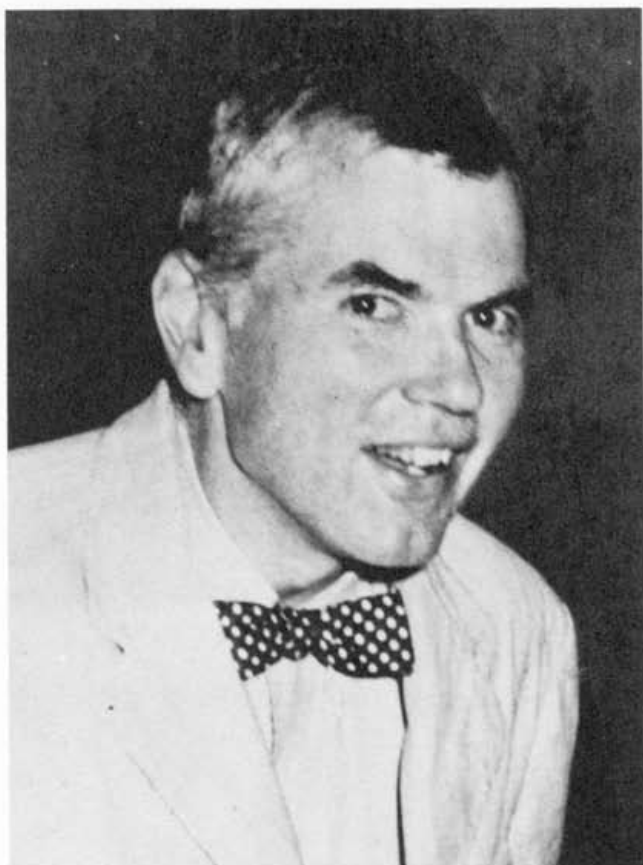
*A Biographical Memoir by*

A. LEAF

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*Biographical Memoir*

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*Fuller Albright*

## FULLER ALBRIGHT

*January 12, 1900—December 8, 1969*

BY A. LEAF

FULLER ALBRIGHT was born in Buffalo, New York, just twelve days after the opening of the twentieth century. His childhood and youth were passed in that period of peace, prosperity, and general optimism that came to an end with the outbreak of World War I.

His father was an industrialist, art patron, and philanthropist. His mother, a Fuller from Lancaster, Massachusetts, embodied the finest traditions of the New England culture. It was a large, happy, and close-knit family in which parents and children shared much of their lives together—whether at the great house in Buffalo, the long summer vacations at the family camp in the Adirondacks, the winter holidays at Jekyll Island, or on the “Grand Tour” of Europe.

It was a family characterized by a strong sense of humor—and no child growing up in it was in danger of developing a sense of self-importance. Nor were the close family ties confining. It was a hospitable household with a constant flow of visitors. However, when he entered Harvard College at the age of seventeen, young Albright was possessed of a naiveté that was unusual even in those days and an appearance that was positively cherubic! That look of boyish innocence somehow stayed with him always. He also displayed a natural ebullience and gregariousness that allowed him to fit easily into the society of a

Harvard undergraduate in the Boston community. In the Delphic Club he established friendships that he cherished all his life.

He graduated from college *cum laude* in three years and entered medical school in the fall of 1920. It was when he started to see patients that his long-range goals began to take form. At first he was fascinated by obstetrics. Later in the medical course he had a brief infatuation with orthopedic surgery but came to the conclusion that he did not have the manual dexterity to make a good surgeon. At the same time striking advances in medical research were being reported. Professor James Howard Means returned from a medical meeting to announce the dramatic discovery of insulin. Biochemistry was beginning to furnish new insights into the functioning of the body. Albright's natural curiosity was stimulated by the possibilities of applying the new discoveries to the study of disease. It was whetted too by the emotional experience of observing firsthand what, for example, this new insulin could do for a patient at death's door from uncontrolled diabetes. Throughout his later career his investigations were apt to be linked to the puzzles his own patients presented to him rather than to abstract problems of biochemistry.

After an internship in medicine at the Massachusetts General Hospital, he spent a year of research there with Dr. Joseph C. Aub, whose studies in lead poisoning meshed closely with Albright's burgeoning interest in the metabolism of calcium. In this happy environment in the company of Aub, Means, and Bauer, his latent talent began to blossom and clearly indicated the career that he should follow. Then came a year as assistant resident at Johns Hopkins under Dr. Warfield Longcope. Here he struck up an acquaintance with John Eager Howard, who shared his interest in endocrinology. They became fast friends and for years were in almost constant communication trying out new ideas on each other. Often, when

such ideas reached fruition, neither of them knew whose it was in the first place—nor cared. Before returning to Boston he spent a year in Vienna with the great pathologist, Professor Jacob Erdheim, who proved to be an inspiring preceptor.

The remainder of his professional life was spent in research, teaching, and practice at the Massachusetts General Hospital. It was an extraordinarily productive career, which brought forth new concepts in endocrinology and delineated a number of hitherto unrecognized diseases. During this period he had associated with him in his laboratory a succession of young investigators who became leaders in the field of endocrinology in this country and abroad.

In 1933 he was married to Claire Birge, of New York, in what proved to be a supremely happy match. Claire was a superb hostess, and their household provided warm hospitality to hosts of students and visitors from all parts of the world.

There are two sons: Birge, an attorney in Boston, and Read Ellsworth, who teaches at the Fenn School, in Concord, Massachusetts.

Dr. Albright's clinical investigations were highly original and far-reaching. His name is associated with the initial clinical description of hyperparathyroidism and the distinction between over-activity of all parathyroid tissue and the effect of adenoma of a single parathyroid gland. He called attention to the association of hyperparathyroidism with kidney stones; and, in fact, on the basis of an extensive study carried out in his Stone Clinic, he laid the basis for the modern diagnosis and treatment of this condition. In his laboratory was developed a method for measuring gonadotropins in the urine, which made it possible to characterize various types of amenorrhea as well as disorders of testicular functions. In 1928 he described a condition that has come to be known as Albright's syndrome, the distinguishing features of which are precocious puberty in girls, cystic bone disease, and brownish pigmentation of the skin. More than half

a dozen other original descriptions of disease might with equal propriety have borne his name. He pointed out the role of steatorrhea in depleting the body of fat-soluble vitamins. He first described renal tubular acidosis and its effective treatment with alkali. He called attention to the occurrences of thinning of the bones in women following menopause. He was among the first to use estrogen to inhibit ovulation in women and progesterone to correct the metropathia caused by estrogens. He unraveled the pathogenesis of Cushing's syndrome and sounded the first warnings of the harmful side effects of steroids on the tissues.

A total of 118 scientific papers bear his name, and his book *The Parathyroid Glands and Metabolic Bone Disease*, published in 1948, is still a prime source of information on the subject.

Dr. Albright was the recipient of honors and awards from universities and learned societies all over the world. He was President of the American Society for Clinical Investigation in 1943–1944, the Association for the Study of Internal Secretions in 1945–1946, and the Endocrine Society in 1946–1947. He was elected to membership in the National Academy of Sciences in 1955.

In 1937, at the height of his productivity, the early signs of Parkinson's disease made their appearance and progressed very gradually but relentlessly for nearly two decades. This long period was one of almost feverish activity for him, as if he were trying to outstrip the relentless advance of his disease. He maintained, nevertheless, a sublime indifference to his disability and managed to communicate complex ideas with extraordinary lucidity. Finally, in 1956, at his own insistence, he went through the newly devised surgical treatment for Parkinson's disease, the indications and contraindications for which were not fully understood and which left him worse off than before. The remainder of his life was spent in helpless invalidism, mitigated only by a clouding of the sensorium and the devoted care of nurses and attendants at the Massachusetts General Hospital.

In 1955 Harvard awarded Fuller Albright the honorary degree of Doctor of Science with the following citation:

“Brilliant investigator in the complex field of nutrition and metabolism, your keen mind and enormous courage are a credit to this University and to Medicine.”

His tastes were simple. He was never so happy as when casting a trout fly in an Adirondack lake, unless it was when he was talking shop with a colleague. He loved a good game of bridge. He had a good eye for color and form, but no ear at all for music. He and his wife Claire were both fond of travel and did a good deal of it in this country, in Europe, and in South America.

His dress reflected his lack of self-consciousness. Who can forget the old tweed jacket, the baggy trousers, and the jaunty bow tie?

One of Dr. Albright's best remembered characteristics was the twinkle in his eye, which was a manifestation of his unconquerable *joie de vivre* and a slightly amused outlook on the human condition. He carried his sense of humor into his medical writings and even into his lectures, a rare accomplishment indeed, which added immensely to his effectiveness and popularity.

Everyone who knew him has a stock of warm and pleasant memories of their associations with him. One day he was joined by a young aggressive foreign visitor in attendance at one of his clinics. In the course of the discussion regarding one of the patients seen on that occasion, the visitor reprimanded Dr. Albright for not having read the visitor's writings on the subject. Whereupon Dr. Albright humbly apologized for his negligence but added, “I hardly have time to read my own.”

At that time he was already seriously incapacitated physically, but not mentally, by Parkinson's disease. Even then his cheerful demeanor and unrelenting good nature had a highly psycho-

therapeutic effect upon many of the patients who flocked to him for help. Minor complaints usually evaporated instantaneously in the presence of this revered physician who refused to make any concessions to his own unavoidable physical infirmities.

In addition to his continuous and diverse clinical investigations, he managed a busy practice up to the end. Several special clinics that he conducted were an important part of his clinical practice. Thus, he established and presided over the Ovarian Dysfunction Clinic, the Stone Clinic, and his Saturday morning clinic. When asked what he saw at the unnamed Saturday clinic, he was wont to respond with a twinkle in his eye, "These are the patients I refer only to myself." In fact, it was from the often rare and esoteric problems that this group of patients had that many of his clinical investigations arose. He had an uncanny ability to capitalize upon Nature's experiments, to unravel complex disorders and provide clear physiologic understanding that often led directly to rational therapy for his suffering patients. His pleasure in unraveling some important physiological relationship was indeed great, but he always thought of his new findings in terms of how they would relate to improved treatment for some unfortunate patient. The theoretical and the practical were productively enhanced by his ever-active mind.

In a tribute to Dr. Albright published in 1962, one of his younger collaborators wrote as follows:

"What about the personality of this remarkable investigator under whose luminous common sense so many knotty problems suddenly seemed simple? He never discussed personalities. His private life was uneventfully happy. He married Claire Birge and lived happily thereafter in a serene and comfortable home where friends from all over the world were received. What about his heroic battles with his tragic disease? Was it, after all, heroism which made him refuse to stop doing what he liked to do or was it just more of his famous common sense? His indif-



ference to pity was the indifference of a profoundly serene and happy man to public opinion of any kind. Perhaps Claire's role was more heroic; certainly it was brilliant. Charming, vivacious, and full of enthusiasm she appeared perfectly carefree as she added to her domestic duties the jobs of chauffeur, secretary, and finally nurse and shouldered all the burdens of the man of the house while appearing to depend on her husband. Although he never was made to feel dependent on his wife, Fuller could not have continued to work productively without her. Perhaps they are both heroes, but they are certainly not martyrs. Martyrs are never so widely loved and respected in their own time."

I WISH TO ACKNOWLEDGE others of Dr. Albright's friends, collaborators, and students who contributed to the preparation of this memoir: Frederic C. Bartter, John Browne, James M. Faulkner, Anne P. Forbes, Philip H. Henneman, and John E. Howard.

## DEGREES, APPOINTMENTS, AND HONORS

## DEGREES

- 1921           A.B., Harvard University  
 1924           M.D., Harvard Medical School  
 1955           S.D., Harvard University (Honorary)

## APPOINTMENTS

- 1924–1926   West Medical House Officer, Massachusetts General  
 Hospital  
 1926–1927   Research Fellow in Industrial Medicine, Harvard Medi-  
 cal School  
 1927–1928   Research Fellow, Massachusetts General Hospital  
 1928–1929   Moseley Traveling Fellow, Harvard Medical School  
 1929–1935   Henry Pickering Walcott Fellow in Clinical Medicine,  
 Harvard Medical School  
 1929–1937   Assistant Physician in Medicine, Massachusetts General  
 Hospital  
 1930–1935   Instructor in Medicine, Harvard Medical School  
 1935–1938   Associate in Medicine, Harvard Medical School  
 1937–1939   Associate Physician in Medicine, Massachusetts General  
 Hospital  
 1938–1942   Assistant Professor of Medicine, Harvard Medical School  
 1939–1958   Physician in Medicine, Massachusetts General Hospital  
 1942–1961   Associate Professor of Medicine, Harvard Medical School  
 1958–1969   Board of Consultation, Massachusetts General Hospital  
 1961–1969   Professor of Medicine, Emeritus, Harvard Medical  
 School

## MEMBERSHIPS

- American College of Physicians  
 American Society of Clinical Investigation (President, 1943–1944)  
 Association of American Physicians  
 Association for the Study of Internal Secretions (President, 1945–  
 1946)  
 National Academy of Sciences  
 Phi Beta Kappa  
 Alpha Omega Alpha

American Medical Association  
Massachusetts Medical Society

## HONORARY MEMBERSHIPS

1951      *Royal Society of Medicine*  
1951      *Swedish Endocrinology Society*  
1953      *Columbia Endocrinology Society*  
1954      *American Orthopaedic Association*

## AWARDS

1947      Roche–Organnon Award in Endocrinology  
1947      American College of Physicians Award for Achievement  
            in Internal Medicine  
1949      Borden Award, Association of American Medical Col-  
            leges, for “extraordinarily original and monumental  
            contributions to the understanding of metabolism of  
            bone and other tissues.”  
1951      The Joseph Goldberger Award of the American Medi-  
            cal Association’s Council on Foods and Nutrition  
1955      Doctorate of Science, Harvard University  
1961      Citation, Massachusetts General Hospital, for being one  
            of the 15 outstanding physicians who had received early  
            training at the hospital

## BIBLIOGRAPHY

*KEY TO ABBREVIATIONS*

- Am. J. Med. Sci. = American Journal of Medical Science  
 Ann. Internal Med. = Annals of Internal Medicine  
 Arch. Intern. Med. = Archives of Internal Medicine  
 Bull. Johns Hopkins Hosp. = Bulletin of the Johns Hopkins Hospital  
 J. Am. Med. Assoc. = Journal of the American Medical Association  
 J. Clin. Endocrinol. = Journal of Clinical Endocrinology  
 J. Clin. Endocrinol. Metab. = Journal of Clinical Endocrinology and Metabolism  
 J. Clin. Invest. = Journal of Clinical Investigation  
 J. Urol. = Journal of Urology  
 Metab. Clin. Exp. = Metabolism: Clinical and Experimental  
 N. Engl. J. Med. = New England Journal of Medicine  
 Trans. Assoc. Am. Physicians = Transactions of the Association of American Physicians

1929

- The syndrome produced by aneurysm at or near the junction of the internal carotid artery and the circle of Willis. *Bull. Johns Hopkins Hosp.*, 44:215.
- With W. Bauer and J. C. Aub. Studies of calcium and phosphorus metabolism. II. The calcium excretion of normal individuals on a low calcium diet, also data on a case of pregnancy. *J. Clin. Invest.*, 7:75.
- With W. Bauer, M. Ropes, and J. C. Aub. Studies of calcium and phosphorus metabolism. IV. The effect of the parathyroid hormone. *J. Clin. Invest.*, 7:139.
- With R. Ellsworth. Studies on the physiology of the parathyroid glands. I. Calcium and phosphorus studies on a case of idiopathic hypoparathyroidism. *J. Clin. Invest.*, 7:183.
- With W. Bauer. The action of sodium chloride, ammonium chloride, and sodium bicarbonate on the total acid-base balance of a case of chronic nephritis with edema. *J. Clin. Invest.*, 7:465.
- With W. Bauer and J. C. Aub. Studies of calcium and phosphorus metabolism. V. A study of the bone trabeculae as a readily available reserve supply of calcium. *Journal of Experimental Medicine*, 49:145.

1930

With W. Bauer and J. C. Aub. A case of osteitis fibrosa cystica (osteomalacia?) with evidence of hyperactivity of the parathyroid bodies. *Metabolic Studies II. J. Clin. Invest.*, 8:229-48.

1931

With W. Bauer, J. R. Cockrill, and R. Ellsworth. Studies on the physiology of the parathyroid glands. II. The relation of the serum calcium to the serum phosphorus at different levels of parathyroid activity. *J. Clin. Invest.*, 9:659.

With W. Bauer and J. C. Aub. Studies of calcium and phosphorus metabolism. VIII. The influence of the thyroid gland and the parathyroid hormone upon the total acid-base metabolism. *J. Clin. Invest.*, 10:187.

1932

With P. C. Baird. Treatment of Addison's disease with cortin (Hartman). *Arch. Intern. Med.*, 50:394.

With J. C. Aub, W. Bauer, and E. Rossmeisl. Studies of calcium and phosphorus metabolism. VI. In hypoparathyroidism and chronic steatorrhea with tetany with special consideration of the therapeutic effect of thyroid. *J. Clin. Invest.*, 11:211.

With W. Bauer, D. Claffin, and J. R. Cockrill. Studies in parathyroid physiology. III. The effect of phosphate ingestion in clinical hyperparathyroidism. *J. Clin. Invest.*, 11:411.

1933

Hyperthyroidism: its diagnosis and exclusion. *N. Engl. J. Med.*, 209:476.

With R. L. Brown. Estrin therapy in a case of hemophilia. *N. Engl. J. Med.*, 209:630.

With H. B. Sprague and C. H. Ernlund. Clinical aspects of persistent right aortic root. *N. Engl. J. Med.*, 209:679.

With P. C. Baird and E. Cloney. Effect of cortical hormone in preventing extreme drop in colonic temperature displayed by hypophysectomized rats upon exposure to cold with preliminary

observations upon the effect of hypophyseal and other hormones. *American Journal of Physiology*, 104:489.

1934

With E. Bloomberg, B. Castleman, and E. D. Churchill. Hyperparathyroidism due to diffuse hyperplasia of all parathyroid glands rather than adenoma of one. *Arch. Intern. Med.*, 54:315.

With J. C. Aub and W. Bauer. Hyperparathyroidism: a common and polymorphic condition as illustrated by seventeen proven cases from one clinic. *J. Am. Med. Assoc.*, 102:1276.

With E. Bloomberg. Hyperthyroidism and renal disease. *Transactions of the American Association of Genito-Urinary Surgeons*, 27:195-202.

With P. C. Baird, O. Cope, and E. Bloomberg. Studies on the physiology of the parathyroid glands. IV. Renal complications of hyperparathyroidism. *Am. J. Med. Sci.*, 187:49.

1935

Hyperparathyroidism: a case with several unusual features, including a probably non-related chondrosarcoma, Bence-Jones proteinuria, and hyperplasia of all parathyroid tissue. *Medical Clinics of North America*, 18:1109-16.

With J. A. Halstead and E. Cloney. Studies on ovarian dysfunction. I. Hormone "measuring sticks" available for clinical use and values obtained on normal individuals. *N. Engl. J. Med.*, 212:192.

With J. A. Halstead. Studies on ovarian dysfunction. II. The application of the "hormonal measuring sticks" to the sorting out and to the treatment of the various types of amenorrhea. *N. Engl. J. Med.*, 212:250.

1936

Studies on ovarian dysfunction. III. The menopause. *Endocrinology*, 20:24.

Renal osteitis fibrosa cystica. Report of a case with discussion of metabolic aspects. *Trans. Assoc. Am. Physicians*, 51:199.

1937

Some indications and contraindications in the medical treatment of nephrolithiasis. *International Clinics*, 3 (ser. 47):281.

- With A. M. Butler, A. O. Hampton, and P. H. Smith. Syndrome characterized by osteitis fibrosa disseminata, areas of pigmentation and endocrine dysfunction, with precocious puberty in females. *N. Engl. J. Med.*, 216:727.
- Some medical aspects of the renal stone problem. *N. Engl. J. Med.*, 217:1063.
- With T. G. Drake and H. W. Sulkowitch. Renal osteitis fibrosa cystica. Report of a case with discussion of metabolic aspects. *Bull. Johns Hopkins Hosp.*, 60:377.
- With H. W. Sulkowitch and E. Bloomberg. Further experience in the diagnosis of hyperparathyroidism. *Am. J. Med. Sci.*, 193:800.
- With T. G. Drake and B. Castleman. Parathyroid hyperplasia in rabbits produced by parenteral administration. *J. Clin. Invest.*, 16:203.
- Hyperparathyroidism due to idiopathic hypertrophy (? hyperplasia) of parathyroid tissue: follow-up report on six cases. *Trans. Assoc. Am. Physicians*, 52:171.
- With A. M. Butler and E. Bloomberg. Rickets resistant to vitamin D therapy. *American Journal of Diseases of Children*, 54:529.

## 1938

- With W. B. Scoville and H. W. Sulkowitch. Syndrome characterized by osteitis fibrosa disseminata, areas of pigmentation, and a gonadal dysfunction. *Endocrinology*, 22:411.
- Changes simulating Legg-Perthes disease (osteochondritis deformans juvenilis) due to juvenile myxedema. *Journal of Bone and Joint Surgery*, 20:764.
- With L. Dienes and H. W. Sulkowitch. Pyeloneohritis with nephrocalcinosis. *J. Am. Med. Assoc.*, 110:357.
- With H. W. Sulkowitch and E. Bloomberg. Hyperparathyroidism due to idiopathic (hyperplasia ?) of parathyroid tissue. *Arch. Intern. Med.*, 62:199.
- With H. W. Sulkowitch. The effect of vitamin D on calcium and phosphorus metabolism; studies on four patients. *J. Clin. Invest.*, 17:305.
- With E. Bloomberg, T. G. Drake, and H. W. Sulkowitch. A comparison of the effects of A.T. 10 (dihydrrotachysterol) and vitamin D on calcium and phosphorus metabolism in hypoparathyroidism. *J. Clin. Invest.*, 17:317.

The metabolic effects of A.T. 10 (dihydrotachysterol) compared with those of vitamin D and with those of the parathyroid hormone. *Trans. Assoc. Am. Physicians*, 53:221.

The gonads. In: *Internal Medicine*, ed. by J. H. Musser, 3d ed., pp. 917-37. Philadelphia: Lea & Febiger.

Metropathia hemorrhagica. *Journal of the Maine Medical Association*, 29:235.

1939

With H. W. Sulkowitch and E. Bloomberg. A comparison of the effects of vitamin D dihydrotachysterol (A.T. 10) and parathyroid extract on the disordered metabolism of rickets. *J. Clin. Invest.*, 18:165.

With T. G. Drake, W. Bauer, and B. Castleman. Chronic idiopathic hypoparathyroidism; report of six cases with autopsy findings in one. *Ann. Intern. Med.*, 12:1751.

Note on the management of hypoparathyroidism with dihydrotachysterol. *J. Am. Med. Assoc.*, 112:2592.

With H. W. Sulkowitch and R. Chute. Nonsurgical aspects of the kidney stone problem. *J. Am. Med. Assoc.*, 113:2049.

1940

With J. D. Stewart. Hypovitaminosis of all fat-soluble vitamins due to steatorrhea. *N. Engl. J. Med.*, 223:239.

With W. V. Consolazio, F. S. Coombs, H. W. Sulkowitch, and J. H. Talbott. Metabolic studies and therapy in a case of nephrocalcinosis with rickets and dwarfism. *Bull. John Hopkins Hosp.*, 66:7.

With S. Sturgis. The mechanism of estrin therapy in the relief of dysmenorrhea. *Endocrinology*, 26:68.

With E. Bloomberg and P. H. Smith. Post-menopausal osteoporosis. *Trans. Assoc. Am. Physicians*, 55:298.

1941

With P. H. Smith and A. M. Richardson. Post-menopausal osteoporosis: its clinical features. *J. Am. Med. Assoc.*, 116:2464.

With R. Fraser, A. P. Forbes, H. W. Sulkowitch, and E. C. Reifenschein, Jr. Colorimetric assay of 17 ketosteroids in urine. *J. Clin. Endocrinol.*, 1:234.

With R. Fraser and P. H. Smith. The value of the glucose tolerance



test, the insulin tolerance test, and the glucose insulin tolerance test in the diagnosis of endocrinologic disorders of glucose metabolism. *J. Clin. Endocrinol.*, 1:297.

With W. Parson and E. Bloomberg. Cushing's syndrome interpreted as hyperadrenocorticism leading to hypergluconeogenesis: results of treatment with testosterone propionate. *J. Clin. Endocrinol.*, 1:375.

With R. Fraser, A. P. Forbes, R. B. Miller and E. C. Reifenstein, Jr. A classification of the cause of hypoleydigism. *Trans. Assoc. Am. Physicians*, 56:43.

With C. H. Burnett, O. Cope, and W. Parson. Acute atrophy of bone (osteoporosis) stimulating hyperparathyroidism. *J. Clin. Endocrinol.*, 1:711.

## 1942

The parathyroids—physiology and therapeutics. Chap. 26 in: *Glandular Physiology and Therapy*. Am. Med. Assoc. Council on Pharmacy and Chemistry. Chicago: Am. Medical Assoc.

With C. H. Burnett, P. H. Smith, and W. Parson. Pseudohypoparathyroidism—an example of Seabright's bantam syndrome. *Endocrinology*, 30:922.

With P. H. Smith and R. Fraser. A syndrome characterized by primary ovarian insufficiency and decreased stature. Report of 11 cases with a digression on hormonal control of axillary and pubic hair. *Am. J. Med. Sci.*, 204:625; also in *Trans. Assoc. Am. Physicians*, 57:219 (A).

With H. E. Klinefelter, Jr., and E. D. Reifenstein, Jr. Syndrome characterized by gynecomastia, aspermatogenesis without A-leydigism, and increased excretion of follicle-stimulating-hormone. *J. Clin. Endocrinol.*, 2:615.

With H. I. Suby and R. M. Suby. Properties of organic acid solutions which determine their irritability to the bladder mucous membrane and the effect of magnesium ions in overcoming this irritability. *J. Urol.*, 48:549-62.

## 1943

With H. Suby. Dissolution of phosphatic urinary calculi by the retrograde introduction of a citrate solution containing magnesium. *N. Engl. J. Med.*, 228:81.

- With T. H. Ingalls and G. Donaldson. Locus of action of the parathyroid hormone: experimental studies with parathyroid extract on normal and nephrectomized rats. *J. Clin. Invest.*, 22:603-8.
- Cushing's syndrome, its pathological physiology, its relationship to the adrenogenital syndrome, and its connection with the problem of the reaction of the body to injurious agents (alarm reaction of Selye). *Harvey Lectures*, 38:123.
- With P. H. Smith and E. Dodge. Modification on methods for the precipitation and assay of increased amounts of pituitary gonadotropic substance in the urine. *Journal of Laboratory and Clinical Medicine*, 28:1761.
- With H. F. Klinefelter, Jr., and G. Griswold. Experience with a quantitative test for normal or decreased amounts of FSH in the urine in endocrinologic diagnosis. *J. Clin. Endocrinol.*, 3:529.
- With A. Sutphin and D. J. McCune. Five cases (three in siblings) of idiopathic hypoparathyroidism associated with moniliasis. *J. Clin. Endocrinol.*, 3:625.
- Introduction to diseases of the ductless glands. In: *Textbook of Medicine*, ed. by R. L. Cecil, p. 1203, 6th ed. Philadelphia: W. B. Saunders Co.

1944

- With E. C. Reifenstein, Jr. Paget's disease: a concept as to its pathologic physiology and the importance of this in the complications arising from fracture and immobilization. *N. Engl. J. Med.*, 231:343.
- Some of the "do's and do-not's" in clinical investigation. (Presidential Address) *J. Clin. Invest.*, 23:921.

1945

- With E. C. Reifenstein, Jr., A. P. Forbes, E. Donaldson, and E. Carroll. Effect of methyl testosterone on urinary 17-ketosteroids of adrenal origin. *J. Clin. Invest.*, 24:416.
- With E. C. Reifenstein and S. L. Wells. The accumulation, interpretation, and presentation of data pertaining to metabolic balances, notably those of calcium, phosphorus, and nitrogen. *J. Clin. Endocrinol.*, 5:367.

## 1946

- With F. A. de la Blazé and E. C. Reifenstein, Jr. Differential blood counts in certain adrenal cortical disorders (Cushing's syndrome, Addison's disease and panhypopituitarism). *J. Clin. Endocrinol.*, 6:312.
- With C. H. Burnett, W. Parson, E. C. Reifenstein, Jr., and A. Roos. Osteomalacia and late rickets: the various etiologies met in the United States with emphasis on that resulting from a specific form of renal acidosis, the therapeutic indications for each etiological sub group, and the relationship between osteomalacia and milkman's syndrome. *Medicine*, 25:399.
- With A. P. Forbes and E. C. Reifenstein, Jr. The fate of plasma protein administered intravenously. *Trans. Assoc. Am. Physicians*, 59:221.

## 1947

- The effect of hormones on osteogenesis in man. *Recent Progress in Hormone Research*, 1:293-353.
- Introduction to diseases of the ductless glands. In: *Textbook of Medicine*, ed. by R. L. Cecil and others, p. 1322, 7th ed. Philadelphia: W. B. Saunders Co.
- With E. C. Reifenstein, Jr. The metabolic effects of steroid hormones in osteoporosis. *J. Clin. Invest.*, 26:24.
- With A. P. Forbes, E. C. Reifenstein, Jr., and E. C. Donaldson. The effect of trauma and disease on the urinary 17-ketosteroid excretion in man. *J. Clin. Endocrinol.*, 7:264.
- Polyostotic fibrous dysplasia: a defense of the entity. *J. Clin. Endocrinol.*, 7:307.
- With N. B. Talbot, A. H. Saltzman, A. Zygmontowicz, and R. Wixon. The excretion of 11-oxycorticosteroid-like substances by normal and abnormal subjects. *J. Clin. Endocrinol.*, 7:331.
- Osteoporosis. *Ann. Intern. Med.*, 27:861.

## 1948

- A page out of the history of hyperparathyroidism. *J. Clin. Endocrinol.*, 8:637.

- With (by invitation) H. Frick. An attempt to classify hormonal disorders of the hypophysis. *Trans. Assoc. Am. Physicians*, 61:42.
- With D. G. Cogan and F. C. Bartter. Hypercalcemia and band keratophy. Report of nineteen cases. *Archives of Ophthalmology*, 40:624.

1949

- With C. H. Burnett, R. Commons, and J. Howard. Hypercalcemia without hypercalciuria or hypophosphatemia, calcinosis, and renal insufficiency. *N. Engl. J. Med.*, 240:787.
- With (by invitation) F. C. Bartter and A. P. Forbes. The fate of human serum albumin administered intravenously to a patient with idiopathic hypoalbuminemia and hypoglobulinemia. *Trans. Assoc. Am. Physicians*, 62:204.

1950

- With A. P. Forbes, E. C. Bartter, E. C. Reifenshtein, Jr., D. F. Bryant, L. D. Cox, and E. Dempsey. Studies of the fate of intravenously administered human plasma proteins in idiopathic hypoalbuminemia and in osteoporosis. In: *Symposia on Nutrition*, vol. 2, p. 155: *Plasma Proteins*, Robert Gould Research Foundation, Inc. Springfield, Ill.: Charles C Thomas, Publisher.
- With R. P. Howard, R. C. Sinffen, and F. A. Simmons. Testicular deficiency: a clinical and pathologic study. *J. Clin. Endocrinol.*, 10:121.
- With A. P. Forbes and G. C. Griswold. Clinical experience with a bioassay method for the determination of urinary corticosteroids. *J. Clin. Endocrinol.*, 10:230.
- With F. C. Bartter, P. Fourman, A. P. Forbes, W. M. Jefferies, G. Griswold, E. Dempsey, D. Bryant, and E. Carroll. The effects of adrenocorticotrophic hormone in panhypopituitarism. *J. Clin. Invest.*, 29:950.
- With P. Fourman, F. C. Bartter, E. Carroll, and J. Alexander. Effects of 17-hydroxy-corticosterone ("compound") in man. *J. Clin. Invest.*, 29:1462.
- With F. C. Bartter and A. P. Forbes. A comparison of the effects of ACTH in panhypopituitarism, ovarian agenesis and acromegaly. In: *Proceedings of the First Clinical ACTH Conference*, ed. by

John R. Mote. New York: The Blakiston Co. (Sponsored by Armour and Co., Chicago)

- With F. C. Bartter, P. Fourman, W. M. Jefferies, E. Dempsey, and E. Carroll. Does methyl testosterone modify the effects of adrenocorticotrophic hormone (ACTH) and of desoxycorticosterone glucosides (DOCG)? In: *Pituitary-Adrenal Function*, pp. 109–21. (Symposium) Washington, D.C.: Am. Assoc. Adv. Sci.
- With H. Elrick, F. C. Bartter, A. P. Forbes, and J. Reeves. Further studies on pseudo-hypoparathyroidism: report of four new cases. *Acta Endocrinologica*, 5:199–225.

## 1951

- With F. C. Bartter, A. P. Forbes, A. Leaf, E. Dempsey, and E. Carroll. The effects of adrenocorticotrophic hormone and cortisone in the adrenogenital syndrome associated with congenital adrenal hyperplasia: an attempt to explain and correct its disordered hormonal pattern. *J. Clin. Invest.*, 30:237.
- Diseases of the ductless glands (revised). In: *Textbook of Medicine*, ed. by R. L. Cecil and R. F. Loeb, pp. 1215–17, 8th ed. Philadelphia: W. B. Saunders Co.
- With A. P. Forbes. A comparison of the 17-ketosteroid excretion in Cushing's syndrome associated with adrenal tumor and with adrenal hyperplasia. *J. Clin. Endocrinol.*, 11:926.
- With H. I. Suby, J. Wayne, and E. Dempsey. Dissolution of urinary calculi: experiments with ethylene diamine tetra-acetic acid with and without a "wetting agent." *J. Urol.*, 66:527.

## 1952

- With E. C. Reifenshtein, Jr., P. Fourman, E. J. Kepler, E. Dempsey, and F. C. Bartter. Effects of desoxycorticosterone acetate on electrolyte metabolism in a normal man. *Metab. Clin. Exp.*, 1:242.
- With (by invitation) A. P. Forbes and P. H. Henneman. Pseudopseudohypoparathyroidism. *Trans. Assoc. Am. Physicians*, 65:337.
- With F. C. Bartter, R. C. Sniffen, F. A. Simmons, and R. P. Howard. Effects of chorionic gonadotropin (APL) in male "eunuchoidism-with-low-follicle-stimulating-hormone" aqueous solution vs. oil and beeswax suspension. *J. Clin. Endocrinol. Metab.*, 12:1532.

With J. Dawson, E. Dempsey, F. C. Bartter, and A. Leaf. Evidence for the presence of an amphoteric electrolyte in the urine of patients with "renal tubular acidosis." *Metab. Clin. Exp.*, 2:225.

1953

Common sense in endocrinology. *Bull. New York Academy of Medicine*, 29:5.

With H. S. Kupperman, A. Bernstein, A. P. Forbes, and O. Cope. Remission in Cushing's syndrome after bilateral hemiadrenalectomy. *J. Clin. Endocrinol. Metab.*, 13:154.

With P. Henneman, P. H. Benedict, and A. P. Forbes. Idiopathic hypercalciuria. *Proceedings of the Royal Society of Medicine*, 46:1077.

1954

With A. P. Forbes, P. H. Henneman, and G. Griswold. Syndrome characterized by galactorrhea, amenorrhea and low urinary FSH: comparison with acromegaly and normal lactation. *J. Clin. Endocrinol. Metab.*, 14:265.

With L. Kinsell and D. Bryant. The rate of growth of axillary hair as a diagnostic index. *J. Clin. Endocrinol. Metab.*, 14:897.

With W. P. U. Jackson, G. Drewry, J. Hanelin, and M. I. Rubin. Metaphyseal dysplasia, epiphyseal dysplasia, diaphyseal dysplasia, and related conditions. I. Familial metaphyseal dysplasia and craniometaphyseal dysplasia; their relation to leontiasis ossea and osteopetrosis: disorders of "bone remodeling." *Arch. Intern. Med.*, 94:871.

With W. P. U. Jackson and J. Hanelin. Metaphyseal dysplasia, epiphyseal dysplasia, diaphyseal dysplasia and related conditions. II. Multiple epiphyseal dysplasia: its reaction to other disorders of epiphyseal development. *Arch. Intern. Med.*, 94:886.

With W. P. U. Jackson and J. Hanelin. Metaphyseal dysplasia, epiphyseal dysplasia, diaphyseal dysplasia, and related conditions. III. Progressive diaphyseal dysplasia. *Arch. Intern. Med.*, 94:902.