

indication that the present developments will be no exception, in this country at least.

Those who witnessed the transient enthusiasm regarding the guanidine compound Synthalin (which also originated and was marketed in Germany until lenticular, hepatic and renal damage were encountered after sustained use) will welcome long, well-controlled studies by earnest and experienced investigators. To yield to the pressure of healthy diabetics for an easier way than insulin might do more harm than good. It is apparent that the type of diabetes which responds best to the new oral agents is also the type which is easiest to control by diet restriction. Since convenience is the only thing at stake, all concerned should be patient until convincing evidence concerning indications, mechanism of action, and particularly dangers from continued use is available, probably by the end of this year at the latest.

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¹ Franke, H., and Fuchs, J.: Ein neues antidiabetisches Prinzip: Ergebnisse klinischer Untersuchungen. Deut. Med. Wchschr. 80:1449-52, Oct. 7, 1955.

² Achelis, J. D., and Hardebeck, K.: Über eine neue blutzuckersenkende Substanz: Vorläufige Mitteilung. Deut. Med. Wchschr. 80:1452-55, Oct. 7, 1955.

³ Bertram, E., Bendfeldt, E., and Otto, H.: Über ein wirksames perorales Antidiabeticum (BZ 55). Deut. Med. Wchschr. 80:1455-60, Oct. 7, 1955.

⁴ Janbon, M., Lazerges, P., and Metropolitanski, J. H.: Etude du métabolisme du sulfa-isopropyl-thiodiazol (VK 57 ou 2.254 RP) chez le sujet sain et en cours de traitement. Comportement de la glycémie. Montpellier méd. 21-22:489-90, Nov.-Dec., 1942.

⁵ Loubatières, A.: (a) Analyse du mécanisme de l'action hypoglycémiant du p-aminobenzènesulfamidothiodiazol (2254 R.P.). C. R. Soc. Biol. 138:766-67, 1944. (b) Relations entre la structure moléculaire et l'activité hypoglycémiant des aminobenzènesulfamidoalkylthiodiazols. *Ibid.* 138:830-31, 1944. (c) Étude physiologique et pharmacodynamique de certains dérivés sulfaminés hypoglycémiant. Arch. internat. Physiol. 54:174-77, Sept., 1946.

⁶ Bovet, D., and Dubost, P.: Activité hypoglycémiant des aminobenzènesulfamidoalkylthiodiazols. Rapports entre la constitution et l'activité pharmacodynamique. C. R. Soc. Biol. 138:764-65, 1944.

⁷ Chen, K. K., Anderson, R. C., and Maze, N.: Hypoglycemic action of sulfanilamidocyclopropylthiazole in rabbits, and its reversal by alloxan. Proc. Soc. Exper. Biol. & Med. 63:483-86, Nov., 1946.

⁸ Holt, C. v., Holt, L. v., Kröner, B., and Kühnau, J.: (a) Chemische Ausschaltung der A-Zellen der Langerhansschen Inseln. Naturwissenschaften 41:166-67, April 1954. (b) Chemische Ausschaltung der A-Zellen der Langerhansschen Inseln. Arch. exper. Path. u. Pharmakol. 224:66-77, 1954-55.

⁹ Ferner, H.: Cited in 1 and 2.

¹⁰ Creutzfeldt, W., and Tecklenborg, E.: Synthalinhypoglykämie, A-Zellen und Glucagon. Klin. Wchschr. 33:43-44, Jan. 1, 1955.

THIRTY-FIFTH ANNIVERSARY OF THE DISCOVERY OF INSULIN

This issue commemorates the thirty-fifth anniversary of the discovery of insulin. In it are recorded a personal recollection of Banting by Fulton, reminiscences of the work with Banting by Best, the clinical impact of the discovery as recalled by Joslin, and the printing in abridged form of the first report of the clinical use of the successful extract.

On the cover the first human subject to receive insulin, Leonard Thompson, is portrayed. He was fourteen years old when first treated, survived the vicissitudes of severe childhood diabetes and went on to live in good health until 1937 when he died of unrelated pneumonia. Had the precious antibiotics been available, they too might have brought even longer life to a human being who already owed most of his life to the work of two previously unknown but persistent and patient young investigators with an idea.

In considering the origin of their work it is apparent that the roots of their research stretch back almost timelessly into past medical and other scientific advances and experiments; the flower was the substance that consistently proved to be the hormone needed to make up the deficiency that characterizes experimental or human diabetes. Banting had surgical technic, a physiological and clinical appreciation of the possible role of a pancreatic extract which had to be obtained from the tiny endocrine islets imbedded in the mass of exocrine tissue. Best, a biochemically trained scientist, with unflagging energy, had the task of chemical separation and purification of the tissue extracts. Each needed the other and they were a model team for many others to copy.

Others before them, sensing the secret of the islets, had tried and failed to produce a consistently effective substance that was comparable to theirs. Readers of this Journal need no reminder that millions owe their lives directly or indirectly to the success of Banting and Best.

It is fitting therefore to commemorate on suitable anniversaries their achievement which, like so many medical discoveries, unites men of science by integrating knowledge and changing theory to fact or fancy. We grope towards the truth—limited by our own capacities—but discoveries like that of insulin give new minds the opportunity to retest old ideas or formulate

new ones.

The true nature of diabetes mellitus with its protean manifestations, complications, and variations of occurrence from childhood to old age, still eludes us. Indeed the exact structure, role, and locus of action of insulin are still sources of much provocative research and even

controversy. In these days of complicated research with large grantors often pursuing the grantees to "do research," it may be timely to reflect on what was done with minimal assistance and meager equipment by two young men without titles or staff but with an idea and careful labor.

Reminiscences of the Discovery of Insulin

SIR FREDERICK BANTING

1891-1941

Banting was no ordinary investigator; indeed, he was not an ordinary man. I first met him in the autumn of 1923 in the house of Lady Osler at Oxford, and the occasion deserves to be recorded because it so happened that the Regius Professor of Medicine from Cambridge, Sir Clifford Allbutt, was visiting Lady Osler at the time. She introduced him to the young Canadian investigator and suggested that they go for a walk in the parks. Sir Clifford, who had always been greatly interested in young men who were making their way in scientific medicine, was fascinated by Banting, and he questioned him closely about the steps which had led to the discovery of insulin. He also questioned him about much else—art and literature, among other things—and he found that his young Canadian colleague was not only a physiologist, but in the Baconian sense he was also a "full man," for his interests extended to literature and art, and also to music (he was the best baritone in his class). At that time Banting was young, unsure of himself, and almost uncouth in dress and general appearance, but Sir Clifford, with his unerring tact, brought out the best that Banting had to offer, and when they returned to 13 Norham Gardens, Banting's eyes were glittering with a new light, and it was clear that Allbutt had inspired him.

In appraising Banting's various contributions it can be said that his work on insulin and other endocrine extracts gave meaning and significance to classical scientific method as we now recognize it. I should like also to reiterate the tribute which Dr. DuBois* has paid to his practical contributions, not only in the field

of aviation medicine but also in military medicine generally. Banting had a genius for making practical applications, be it in a penetrating study of protective clothing, his introduction of the "clo" unit, or a study of aircraft equipment. He agitated for redesign of cockpits, strengthening the moorings of pilot seats and seat belts, and for moving the pilot's seat back far enough so that in the event of a head-on collision, or a nose-over landing, the pilot's face would not be thrown against the instrument panel.

I always admired Banting for quite another reason, namely, his common-sense attitude toward security regulations. Many of his colleagues in Canada and England were inclined to be overconscientious in matters of security, a trait which generally took the form of an unwillingness to discuss anything with anyone, with the result that there was little in the way of free exchange of ideas, even in a small military establishment, and there was no exchange whatsoever for well-screened and qualified individuals from outside who might have been able to lend the greatest assistance in the solution of a given military problem. Banting was never that way, but gauged his audience and spoke freely about classified material, and especially about instruments that fell into the classified categories, if he felt his colleagues or visitors had something worth while to offer. It was a kind of common sense that was rare, particularly during the early phases of the war. Everything was so hush-hush that one scarcely dared breathe. But not Frederick Banting. And as far

*Remarks of Professor Eugene F. DuBois following presentation of the Banting Medal at the Annual Meeting of the American Diabetes Association, June 1955. *Diabetes* 4:426-27, Sept.-Oct. 1955.