nificance in soil fertility, as suggested by Williams and Spies? However, in our enthusiasm, we must not forget that thiamin is not the only growth substance concerned in plant development. For one organism thiamin synthesis may be a limiting factor, while for another biotin, meso-inositol, vitamin B_6, nicotinic amide or some other growth substance may be important and still other plants may require an external supply of more than one. We have found that in a mineral-sugar solution thiamin is the factor limiting the growth of excised tomato roots. In a mineral-sugar-thiamin solution the ability of the tomato roots to synthesize vitamin B_6 becomes the limiting factor. Careful and critical work is necessary, lest we be set adrift in a maze which is none too simple at best.

In any event the investigations on the relation of thiamin to plants promise the possibility of elucidating important questions in general physiology through the study of more easily controlled material than the higher animal. Of all the growth substances probably involved in its development *Phycomyces Blakesleeanus* apparently lacks the ability to synthesize but one, thiamin; the higher animal is unable to make many. It would be difficult to imagine a simpler and more perfect arrangement than *Phycomyces* for studying the function of thiamin. The studies on the relation of thiamin to plants can not help but emphasize that the physiological mechanisms of fundamental processes are much the same in all living organisms, although details differ. It may not be a compliment, but it should be a salutary corrective of undue pride to realize that although *Phytophthora infestans* does not develop beriberi or polyneuritis it requires thiamin in the same form and probably for the same reasons as we do.

OBITUARY

JAMES PLAYFAIR McMURRICH

ON February 9, 1939, at Toronto, Canada, death from coronary thrombosis took suddenly from our midst a famous scientist, Professor James Playfair McMurrich, who was still actively engaged in writing and research, although in his eightieth year. His passing removes a notable and well-known figure from the ranks of biology and anatomy. But many happy memories of his inspiration and leadership remain, while a large number of accomplished researches and outstanding achievements are a lasting memorial of his exceptional ability combined with untiring application.

Professor McMurrich was born at Toronto on October 16, 1859, the youngest of eight children of the Honorable John McMurrich, M.L.C. and Janet Dickson McMurrich. He matriculated from Upper Canada College and early showed his brilliance of mind and interest in science by obtaining the degree of B.A. at the University of Toronto (1879) before he was twenty years old. Two years later (1881) he also obtained the M.A. and was beginning to write articles for scientific journals.

He now began his career as a teacher, and during the first three years he completed his work for the degree of Ph.D., which was awarded him by Johns Hopkins University in 1885. Later, in recognition of his attainments he received the honorary degree of LL.D. from the Universities of Michigan (1912), Cincinnati (1923) and Toronto (1930).

His academic career, while only one phase of his remarkable existence, was in itself a notable one. His fame early went abroad, and changes of position were rapid. The diversity of his earlier teaching posts gives evidence of his versatility and knowledge. He was successively professor of biology, Ontario Agricultural College, 1882–84, instructor in mammalian anatomy, Johns Hopkins University, 1884–86; professor of biology, Haverford College, 1886–89; docent and assistant professor of animal morphology, Clark University, 1889–92, and professor of biology, University of Cincinnati, 1892–94.

During this period an invitation came to him to become professor of anatomy at Yale. This he declined because he felt it outside of his province. When a similar invitation was proffered by the University of Michigan, however, he decided that its significance should not be unheeded, and he accepted, thus making a radical change in his career. This position he retained for thirteen years, 1894–1907, finally returning to his alma mater, the University of Toronto, in 1907, as professor of anatomy, which post he filled brilliantly until his retirement as professor emeritus in 1930 at the age of seventy.

Professor McMurrich made many firm and lasting friends amongst his colleagues, was loved and respected by his students and was stimulating to his staff. He worked consistently for the advancement of the universities to which he was attached, furthered the cause of science and promoted research. As a result of this policy he was instrumental in founding the School of Graduate Studies in the University of Toronto, which grew rapidly under his oversight, for he presided over its council in the honored position of the first dean for eight years, 1922–30, until his retirement.

His scholarship was profound, his memory phenomenal and his mind was forever active, keen and inquiring. His interests covered a great variety of subjects, many of them far beyond his professional field, and his accumulated knowledge was ever a source

of wonder and admiration to others. But with all his gifts he was never ostentatious, a becoming modesty gracing all his actions. His mind was so active that he was continually working, studying, investigating. He was an ideal research worker and coupled his genius with such diligence and industry that he carried on and brought to completion much valuable and original research work.

His writings comprise a total of 107 publications on widely divergent subjects. Amongst them are five main groups. The first shows his biological interest, which continued throughout his life, and made him a noted specialist on the morphology, phylogeny and classification of the Actinozoa. Specimens from the deep-sea expeditions of the *Siboga* and the *Albatross* were referred to him for study.

The second group of papers comprises numerous studies on fishes, culminating in a series on the salmon and halibut done while a member of the North American Committee on Fisheries Investigation and also of the Biological Board of Canada. Of this latter body he was chairman for several years during its period of most active development. In this connection he was the honored official representative of Canada at the Pan-Pacific Congress in Sydney, Australia, in 1923.

Embryology, both human and comparative, formed a very keen interest on which much work was done, including the writing of a text-book on the "Development of the Human Body," which ran through seven editions.

A fourth interest of course was anatomy, human and comparative. In this field appeared a text-book of "Invertebrate Morphology," four editions of the Sobotta-McMurrich "Atlas of Human Anatomy," the editing of the fourth edition of Morris' "Human Anatomy" and the writing of the sections on the muscular and vascular systems in Piersol's "Human Anatomy."

The final interest, which became stronger with time and was his main activity after retirement from teaching, was the history of anatomy. Here he produced a notable book, "Leonardo da Vinci—the Anatomist." Well advanced at the time of his death was a large work on the history of anatomy. Professor McMurrich read the classics fluently, as well as modern languages, and even added Arabic to his accomplishments in later years, so that he might read original sources for his history.

He was a great believer in the benefits of organized bodies to further science. He joined many societies in which he took an active part and became a member of their executive boards. He was president of the American Society of Naturalists, 1907, and the American Association of Anatomists, 1908. In the year 1922 he was simultaneously president of the American Association for the Advancement of Science and the Royal Society of Canada.

He was an instructor at the Marine Biological Laboratory, Woods Hole, early in his career, and later became a trustee. For years he served on the advisory board of the Wistar Institute of Anatomy and Biology. Other executive positions were held in the American Society of Zoologists and the Royal Canadian Institute, and he was a member of the Royal Microscopical Society, the American Philosophical Society, London Zoological Society, Academy of Sciences and the Osler Club. In all these he took an active part at times. His strength and physical endurance were truly remarkable and were surprising to those who knew him because he never gave the impression of possessing robust health. He was tall and thin in build, of keenly intellectual appearance, and had a mind always demanding much of his vitality. His interests were always objective, never subjective.

Two fraternities were honored in possessing him as a member, Alpha Omega Alpha Honorary Medical Society and Nu Sigma Nu Medical Fraternity. The latter bestowed on him its rare order of merit and elected him president of its honorary council for two years.

Professor McMurrich had a very human side to his life which made him loved as well as respected. He took great pleasure in meeting people and forming new friendships. He was loyal to all his friends and held their affection. His strict integrity and uprightness commanded the respect of all, while his courtesy and kindliness made him very attractive. He was fond of golf, had a passion for travel, took pleasure in his club memberships and was interested in his church. He showed a completely developed, well-rounded personality that took in every normal phase of life.

In 1882 he married Miss Katie M. Vickers. For fifty loyal, happy years they were constant companions, and the happiness of his home no doubt aided materially in raising Professor McMurrich to his high pinnacle of success. A son and a daughter survive him.

Professor McMurrich's eighty years were filled with the wonderful satisfaction that comes from the fullness of life. He lived fully in every way, he achieved great things, he saw his efforts in many fields come to success, he was honored during his lifetime and appreciated for his accomplishments. And last, though not least, at his passing many mourned, but at the same time carried with them the memory of a great man, whose impressive intellectual ability, honor, integrity, grace and kindliness form a noble inspiration to us all.

J. C. WATT

UNIVERSITY OF TORONTO