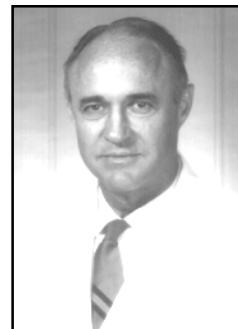


## Guest Editorial

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### PROF. ARTHUR C. GUYTON (1919–2003)

The name 'Guyton' has been synonymous with his textbook of physiology for several generations of medical students all over the world during the last more than four decades. Therefore it was with a sense of shock that the fraternity of medical scientists received the news of the sad demise of Prof. Arthur C. Guyton on 3 April 2003 in an automobile crash near his home in Jackson, Mississippi, U.S.A. His wife of nearly 60 years, Ruth, was with him during the crash and suffered serious injuries, to which she succumbed a week later. Indian physiologists had the good fortune of welcoming Prof.



and Mrs. Guyton in 1974 during the XXVI International Congress of Physiological Sciences (ICPS) which was held in New Delhi, and I had the privilege of interviewing them for the ICPS News Bulletin. In 1974, I had just finished my M.D., and during the three years of my M.D. the only textbook that I had read intensively was 'Guyton'. I had chosen 'Guyton' because I loved it; after reading it intensively, I loved it even more. Therefore to be face-to-face with the author himself was a totally unexpected bonanza. What makes 'Guyton' stand out among textbooks is its character rather than contents. Being a single-author book, which had its origins in the handouts distributed by the author to his students because he felt none of the available books said things the way he would like to say them, it still has the character of a teacher speaking to his students. And, Guyton was no ordinary teacher. A person with exceptional intellectual abilities, he understood the subject matter with remarkable clarity and evaluated it critically. But he did not stop there. He then spent time on trying to discover the best way of putting the subject matter across to the students. That is why 'Guyton' is more than a collection of facts and figures; it embodies the personality of the author.

Professor Guyton was born on 8 September 1919 at Oxford, Mississippi. His father was an eye, ear, nose and throat surgeon and his mother a missionary teacher in China. He was a topper at school and college, and joined Harvard Medical School, from where he received an M.D. in 1943. He got married the same year to Ruth Weigle, a graduate of Wellesley College, and the daughter of the dean of the Yale University Divinity school. His dream was to become a cardiothoracic surgeon. Towards this end he became a surgical intern in 1943 at Massachusetts General Hospital (MGH) in Boston. But in 1944 he was called to serve in the Navy. He returned to MGH

## Prof. A.C. Guyton

Prof. Guyton is a remarkable man, no matter how you know him. His Textbook of Medical Physiology continues to be an authoritative, modern and charming treatise even in the age of multi-author books. As a research worker, he is one of our most eminent cardiovascular physiologists. To look at, one is struck by his crutches which he uses while walking. To talk to, he is gentle, unassuming and full of life.

An inspiring teacher himself, he feels that for teaching well, the teacher should speak at the mental level of his students, besides being well-informed and interested in teaching. To find the level of comprehension of his students, the teacher should get a feedback from his students from time to time. For that he feels that the best way is to have small teaching groups in which considerable two-way communication is possible.

As in other countries, so in the U.S. Prof. Guyton feels that availability of grants for specified research has corrupted research. Very often it results in collection of data without much conceptual value. However, he explains that the Departmental allocation in U.S. Medical Schools is considerable and permits quite a bit of relatively pure research which is motivated more by curiosity than by material gains. According to him, one more reason why many investigators collect too much data these days is that many journals do not publish a paper unless it contains a lot of data.

Prof. Guyton has a very constructive attitude towards his physical handicap. When he got polio, he shifted from surgery to physiology. The brilliant work he has done in physiology in spite of the handicap may be partly because of it. If he did not have it, he might have gone for golf or skiing rather than work in the laboratory, he explains with a smile.

Prof. Guyton has already given us the revolutionary, though controversial concept of negative interstitial fluid pressure. In a few years, he might give us another novel physiological mechanism. He has some evidence which indicates that thirst and ADH mechanisms are the chief regulators of sodium homeostasis. Aldosterone is important only for potassium balance.

Besides being a leading scientist and teacher, Prof. Guyton also feels concerned about the welfare of his fellow beings. According to him, the answer to India's economic ills lies in export promotion. With its rich natural resources and low cost of labour, India has a bright export potential, he explains.

– R. L. BIJLANI

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in 1946 to continue with his surgical residency, but then destiny struck and upset the young doctor's plans. He contracted poliomyelitis, which left his right leg and shoulder paralysed. He accepted the altered situation with a remarkably positive attitude. During the nine months that he spent in the hospital recuperating from polio, he designed a leg brace, a hoist for lifting patients and a motorized wheelchair. In view of his physical limitations, he reset his goals, moved back to his hometown, Oxford, Mississippi, in 1947 and started teaching pharmacology in the medical school. In 1948, he was appointed professor and chairman of the Department of Physiology and Biophysics at the same Medical School at the young age of 29. In 1955, he moved with the School from Oxford to Jackson, Mississippi. He held this position till his retirement in 1989.

Guyton had a knack for original and off-beat research since his childhood. He had a talent for physics, mathematics, electronics and instrumentation – not very common among doctors, but very handy in research. While still a medical student, he went to a professor with some original ideas about measuring and differentiating ions in a solution. The professor was so impressed that he placed at Guyton's disposal a small lab where he could do the work. During World War II, Guyton was assigned to bacterial warfare research. However, when he decided to settle down to academics on a long-term basis, he focussed his attention on the cardiovascular system. The choice is easy to understand in view of his original aim of becoming a cardiothoracic surgeon. His sustained attention to cardiovascular physiology led to the rewriting of some long-

standing concepts. For example, the conventional teaching was that the heart itself controlled its output. But he demonstrated that what the heart pumps depends on how much blood returns to it. The other revolutionary concept he gave is the powerful role of the kidney as the regulator of blood pressure, which it plays by controlling the fluid volume. His third major contribution was the ingenious use of implanted perforated capsules for the measurement of interstitial pressure. Nobody had measured this pressure earlier, and yet everybody found it difficult to believe Guyton's observation that the pressure is subatmospheric. Autoregulation of local blood flow by the interplay of oxygen supply and usage was also originally described by Guyton's group, and is now textbook knowledge. He finally gave computer analysis of circulatory function linking body fluid volume, cardiac output, local blood flow and arterial pressure. The analysis has proved valuable in understanding the pathophysiology of hypertension.

Dr. Guyton was a role model for his students, for whom he always had time. When it came to accessibility, he made no distinction between students and faculty. But he never had time to waste, and did not like anybody else to waste time either on activities such as drinking coffee. That is why it was difficult to find a coffee pot in his department.

He received several prestigious national and international awards for his research and contributions to medical education. He had long spells as the editor of highly regarded journals. He was the President of

the American Physiological Society for the term 1974–75 during which he succeeded where many others before him had failed, viz. in getting approved sections related to subspecialties in physiology with respect to membership and publications. Among his achievements must be counted his eight sons and two daughters, each of whom did medicine, and that too at Harvard Medical

School. One of his sons, Steven, fulfilled his dream by becoming a cardiothoracic surgeon. And, among those who contributed to his achievements, the first to be counted is his wife, Ruth, who stood by him till his last day. He is survived not only by his children but also his textbook through which he lives in the hearts of millions of students all over the world.

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