Professor Arthur Clifton Guyton has been considered a major force in physiology, not only in the United States, but in the world. He was the author of the world's most widely used medical textbooks, a researcher who made significant contributions to the understanding of hypertension and who was the father of 10 Harvard-educated doctors. Dr. Guyton was born in 1919 in Oxford, Mississippi, to a family of Dr. William S. Guyton, an ophthalmologist and dean of the University of Mississippi medical school, and Kate S. Guyton, a math and physics teacher who had been a missionary in China before their marriage.

He graduated from high school with honors and was top in his class at the University of Mississippi. At Harvard Medical School his ideas about measuring and differentiating ions in a solution so impressed a biophysics professor that Guyton was given his own small lab.

Guyton's surgical internship at Massachusetts General Hospital was interrupted by World War II. He served in the Navy at the National Naval Medical Center in Bethesda and later at Camp Detrick in Maryland, earning an Army Commendation Citation. Returning to Massachusetts General to finish his residency, Guyton was stricken with polio. The disease left his right leg and shoulder paralyzed, but that didn't slow him down.

During his recuperation Guyton designed a leg brace, a hoist for lifting patients and a motorized wheelchair. His enthusiasm for building machines he needed became his trademark.

Guyton returned to Oxford in 1947, joining the faculty at the university's School of Medicine. He struck up a friendship with neighbor William Faulkner and taught the author how to sail and to play chess. In 1948 Guyton was appointed professor and chairman of the Department of Physiology and Biophysics, positions he held until his retirement in 1989.

In the 1950s Guyton, whom most students called "The Chief," starting filling in the information void surrounding heart and blood vessel functions. His first major discovery rewrote contemporary wisdom that the heart controlled cardiac output. His "permissive heart" concept showed that body tissues' need for oxygen determined control of the interstitial fluid between the cells, something no one had been able to do. In 1966 he used an early computer model to develop the theory of "infinite gain," which gave the kidneys preeminence as the most important regulator of blood pressure.

Over the course of his career Guyton published hundreds of papers and wrote scores of books. His "Textbook of Medical Physiology" has been a requirement in medical schools worldwide for the past 45 years. Guyton was working on the 11th edition at the time of his death. He published his Textbook of Medical Physiology in 1956. Based on his classroom lectures, it provides one of the foundations of medical education and explains in detail the functioning of the organs. One of the rare medical books written by one author, it is now in its 10th edition and has been translated into 15 languages. Recent editions have been updated by his former student and successor as chairman of the physiology department at the University of Mississippi Medical Center, Dr. John E. Hall.

Dr. Guyton's research contributions, which include more than 600 papers and 40 books, are legendary and place him among the greatest figures in the history of cardiovascular research. His research covered virtually all areas of cardiovascular regulation and led to many
seemal concepts that are now an integral part of our understanding cardiovascular physiology and disorders such as hypertension, heart failure, and edema. It is difficult to discuss cardiovascular regulation without including his concepts of cardiac output and venous return, negative interstitial fluid pressure and regulation of tissue fluid volume and edema, regulation of tissue blood flow and whole body blood flow autoregulation, renal-pressure volume and edema, regulation of tissue blood flow and interstitial fluid pressure and regulation of tissue fluid concepts of cardiac output and venous return, negative discuss cardiovascular regulation without including his hypertension, heart failure, and edema. It is difficult to include the Ciba Award from the Council for High Blood the 400th anniversary of the birth of William Harvey who discovered the circulation of the blood.

Dr Guyton received more than 80 major honors from diverse scientific and civic organizations and universities throughout the world. A few of these that are especially relevant to cardiovascular and hypertension research include the Ciba Award from the Council for High Blood Pressure Research, the William Harvey Award from the American Society of Hypertension, the Research Achievement Award of the American Heart Association, the Merck, Sharp, and Dohme Award of the International Society of Hypertension, and the Wiggers Award of the American Physiological Society. It was appropriate that in 1978 he was invited by the Royal College of Physicians in London to deliver a special lecture honoring the 400th anniversary of the birth of William Harvey who discovered the circulation of the blood.

Although Dr. Guyton’s research accomplishments are legendary. The fact that he and Ruth raised 10 remarkable children, all of whom became outstanding physicians, is a great educational achievement in itself. Eight of the Guyton children graduated from Harvard Medical School, one from Duke Medical School, and one from the University of Miami Medical School after receiving a PhD from Harvard.

The success of the Guyton children did not occur by chance. Dr Guyton’s philosophy of education was to “learn by doing.” The children therefore participated in countless family projects that included the design and construction of their home and heating system, swimming pool, tennis court, sailboats, homemade go-carts and electrical cars, gadgets for their home, and electronic instruments for their Oxford Instruments Company. Television programs such as “Good Morning America” and “20/20” described the remarkable home environment that Arthur and Ruth Guyton created to raise their family. They are a wonderful family, sharing the values of hard work and dedication, teamwork, the excitement of learning and discovery, and a deep love for each other. His devotion to family is beautifully expressed in his “Textbook of Medical Physiology” that bears this dedication: “To My Father for his uncompromising principles that guided my life; My Mother for leading her children into intellectual pursuits; My Wife for her magnificent devotion to her family; My Children for making everything worthwhile.”

Dr Guyton was a master teacher and personally taught every medical student at the University of Mississippi for over 50 years. Even though he was always busy with service responsibilities, research, writing, and teaching, Dr Guyton was never too busy to talk about a new research idea or a new experiment or to talk with a student who was having difficulty. He would never accept an invitation to give a prestigious lecture if it conflicted with his teaching schedule.

His contributions to education are also far reaching through generations of graduate students and postdoctoral fellows. He trained over 150 scientists, of whom at least 29 became chairs of their own departments and 6 became presidents of the American Physiological Society. He gave students confidence in their own abilities and emphasized his belief that “People who are really successful in the research world are self-taught because they are teaching themselves beyond where other people are.” No one has been more prolific in training leaders of physiology than Arthur Guyton. For his many contributions to medical education, Dr Guyton received the 1996 Abraham Flexner Award from the Association of American Medical Colleges. He is also honored each year by the American Physiological Society through the Arthur C. Guyton Teaching Award. In 2001, he received the Eugene Braunwald Academic Mentorship Award from the American Heart Association.

As we already said, Guyton was the father of 10 children, all of whom are physicians. Dr. Guyton had a family life that was every bit as busy as his professional one. A 1982 article in Reader's Digest, "A Doctor Who's Dad to Seven Doctors -- So Far!," described the many family projects that he led, including the design and construction of the family’s house and swimming pool.

When asked why all of the Guyton children had decided to go into medicine, David, the eldest, said, "Daddy never lectured us about medicine: He stimulated our interest." Thomas, the ninth child, said, "He instilled the work ethic in all of us, but I think I learned most from his disability." There were, of course, other motivating factors. In a 1993 article in Harvard Magazine celebrating his father's 50th reunion and the graduation of his youngest sibling from medical school, Douglas, the seventh child, admitted: "The pressure on me was intense. I can only imagine what it must have been like for the three youngest".

The Guyton children are David, of Baltimore; Robert, of Atlanta; John, of Durham, N.C.; Steven, of Seattle;
The young men all received their medical degrees from Harvard; Catherine Greenberger received hers from the University of Miami after earning a bachelor’s and doctorate in organic chemistry from Harvard, and Jean Gispen graduated from the Duke University medical school after finishing her undergraduate work at Harvard. The Guyton physicians are scattered across the country and across medical specialties. David Guyton, MD, professor of pediatric ophthalmology, Johns Hopkins University School of Medicine, Baltimore. Robert Guyton, MD, professor of surgery and chief of the cardiothoracic division, Emory University, School of Medicine, Atlanta. John Guyton, MD, associate professor of medicine, Duke University, North Carolina. Steven Guyton, MD, cardiothoracic surgeon at Virginia Mason Medical Center, Seattle. Cathy Greenberger of Sewickley, Pa.; Jean Gispen of Oxford, Miss.; Douglas, of Reno; James, of Memphis; Thomas, of Memphis; and Gregory, of Baltimore. They are spread across eight states, from Pennsylvania to Georgia to Washington. These MDs represent a variety of medical specialties, from ophthalmology to rheumatology.

"There are almost enough specialties to staff a small hospital. I guess if you could get everyone in the same location," said Cathy Greenberger, MD, one of the sisters.

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Артур Кліфтон Гайтон народився в 1919 році в Оксфорді, штат Миссісіпі, в сім’ї лікаря Вільяма С. Гайтона – офтальмолога і декана медицинського університету Миссісіпі, і Кейт С. Гайтон – вчителки математики та фізики, яка до зміяжки була місіонеркою в Китаї.

Хірургічне стажування А. Гайтона в Массачусетському госпITAL було перерване Другою світовою війною. Під час війни він служив на флоті в Національному військово-морському медичному центру в Бетседі, а потім в табірі Детріка в Кореї. Повернувшись до Массачусетського госпITAL, щоб закінчити своє стажування, А. Гайтон захворів на поломлений. Згодом висвідок звібрі його праву ногу і плече були паралізовані, але не зупинило його на шляху до успіху. А. Гайтон був дуже цілеспрямованою людиною.

Після тривалого лікування в 1947 році він повертається до Оксфорду і працює в медичному університеті. Вже у 1948 році А. Гайтон було призначено професором і завідувачем кафедри фізіології і біофізики. Цю посаду він займав понад 40 років - до 1989 року, коли професор вийшов на пенсію.

У 1950-ті роки А. Гайтону вдалося виміряти тиск інтерстиціальної рідини між клітинами, що до нього не вдавалося зробити нікому. Вже у 1966 році він використовував ранню комп'ютерну модель, щоб розвинути теорію «нескінченного посилення», яка дала змогу довести, що якщо поєднувати перешеє місцеві в регуляції кров'яного тиску.

Випродовж своєї кар'єри професор А. Гайтон опублікував сотні статей, де було вивчене понад 60 грудю років. Вохіт арку вступінка в складну наукову матеріалу щодо функціонування органів людського тіла стали причиною того, що підручник був затребуваний в медицинських школах по всьому світу протягом останніх 45 років і в зв'язку з цим був перекладений на 15 мов.

Випродовж свого тривалого наукового життя професор А. Гайтон отримав багато нагород, в тому числі нагороди від Американської медичної асоціації, Американської асоціації серця і медичних організацій в Росії, Японії та Нідерландів, але свого часу він сказав, що саме Гарвардський журнал дав для нього особливе значення, тому що в 1978 році він отримав запрошення від Королівського коледжу лікарів в Лондоні, щоб прочитати лекцію в честь 400-річчя від дня народження Вільяма Харві, лікаря, який вперше описав циркуляцію крові.

Професор Артур Гайтон загинув в автомобільній аварії недалеко від свого будинку в місті Джексон, штат Миссісіпі, 3 квітня 2003 р. Йому був 83 роки. А. Гайтон дав науковому світу творчий і інноваційний підхід до дослідження і багато нових наукових концепцій серцево-судинної системи регуляції, він дав незлічену кількість студентів по всьому світу, новий погляд та розуміння фізіології, він дав багатьох захоплюючих наукових кар'єр, і, безумовно, він надихнув всіх його відвіданих до творення, його уникальною здатністю виявляти краще в оточуючих його людях. Його 10 дітей, які стали лікарами, гідно продовжують шляхи свого батька.

Ключові слова: Артур Кліфтон Гайтон, фізіологія, медична.

Roman L., Tymofiychuk I. The great physiologist...