# Caribbean ICONS in SCIENCE, TECHNOLOGY & INNOVATION

CARIBBEAN COUNCIL
FOR SCIENCE AND TECHNOLOGY

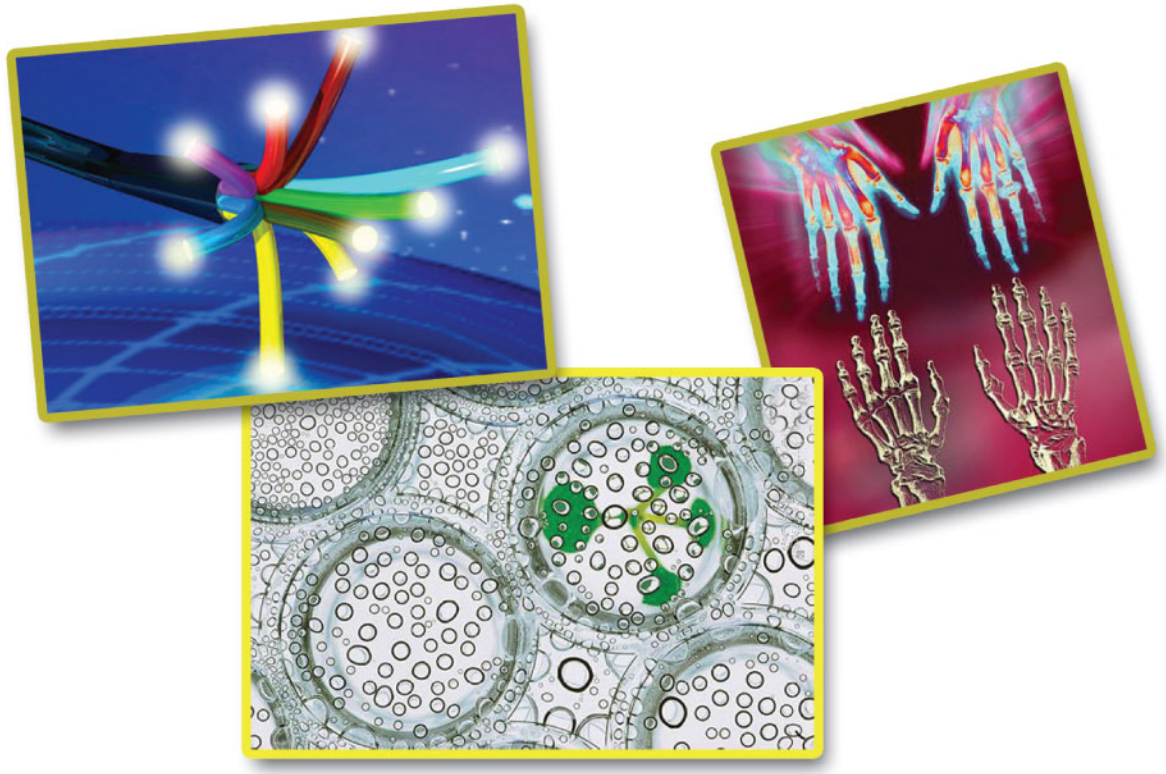
NIHERST
NATIONAL INSTITUTE
OF HIGHER EDUCATION
RESEARCH, SCIENCE AND TECHNOLOGY

# Kids do you know…

## …WHO is an STI Icon?

*An individual who has made an extra-ordinary contribution to Science, Technology and Innovation (STI).*

# Caribbean ICONS in SCIENCE, TECHNOLOGY & INNOVATION



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# Message

This is a book of stories about famous scientists from different islands in the Caribbean, some of them may be even from your homeland. Some of these scientists lived many years ago while others are younger and active today.

Scientists are people who discover or invent things by observing, describing and investigating our world. Every man-made thing we use first started off as a bright idea that a scientist had, or as something that a scientist created. Over time, scientists have helped us to learn why things exist, how things function, how animals live and plants grow. They have helped us to understand how we can do things to make life better, healthier and easier using the discoveries of science.

In this book you will learn about some outstanding Caribbean scientists. These are people whom we call "Icons", because their work in science has made them scientists of excellence. You will learn what their lives were like and what great things they did to improve their country and sometimes even the whole world. You will also learn about the difficulties they faced in becoming a scientist and what inspired them to excel. You will discover the very different areas of science that they worked in and what legacies they left. You will see that science is in every sphere of life.

This book will hopefully make your science class more fun and help you to understand science better. It may also inspire you to have great new ideas and invent wonderful things so that you may become a famous scientist yourself!

*Mrs. Maureen Manchouck*
*President, NIHERST*

# Special Message

*Dr. The Honourable Keith Mitchell*
*Prime Minister of Grenada*
*&CARICOM Minister with responsibility for*
*Science and Technology*

Across the globe, science and technology provide us with tools to improve our lives and for our countries to make progress. The more industrialized countries actively encourage the work of their scientists and pay public tribute to their achievements. They also invest resources to make use of the discoveries and inventions of their scientists so that their societies can keep advancing.

In our region, science and technology can take us from developing country status to first world status. Our region is known for its natural beauty and the creativity of its people. We have scientists who have made world class contributions in many branches of science including medicine, aerospace engineering, mathematics and the life sciences among other fields. Along the way these scientists have charted new courses, set high standards, and have improved the quality of life of people in their country, the region and further afield.

These trailblazers can serve as an important inspiration to our future scientists. Their stories are sure to encourage boys and girls to stay in school, to feed their curiosity and to aspire to careers in the rewarding field of science and technology. It is my hope that our region would always nurture more outstanding men and women in these areas.

I encourage our young readers to strive towards excellence going beyond the achievements of these renowned individuals. I trust that your energy, spirit and perseverance will also lead to many outstanding successes that will redound to the benefit of our region.

## The Breeder of the Buffalypso

# Stephen Bennett

## Veterinarian


*"One does best in what one likes doing best..." - Dr. Stephen Bennett*

***DR. STEPHEN BENNETT*** developed a disease-resistant breed of water buffalo named the buffalypso. The Indian water buffalo that was introduced to Trinidad as a "beast of burden" on the sugar estates was a tough animal. It was less infected with the disease tuberculosis, so Dr. Bennett chose them for selective breeding. After years of research he developed the buffalypso *(Bubalis bubalis)* in the early 1960s.

The buffalypso is a prized breed because of its thick skin that withstands parasites and its good quality beef and milk production. The skin is used in the manufacture of leather goods; its outer layer is used for belts and shoes and the thin inner layer for handbags. The breed was introduced to Argentina, Brazil, Costa Rica, Cuba, Venezuela, the USA and Italy among other countries.

Dr. Bennett also pioneered veterinary practice in Trinidad and the Caribbean. He established services for racehorses, farm and domestic animals. Together with Dr. William Jones, he established a leading small animal clinic in Trinidad and Tobago.

Stephen Bennett was born in Princes Town, Trinidad on January 28th 1922. At the age of ten, he became a professional jockey. While attending Presentation College, he took part in horseracing and other sports.

After high school, he studied agriculture at the University of Guelph, Canada and specialized in animal husbandry. He was an exceptional student and won the prize for the

***Stephen Bennett's buffalypsoes***

highest total marks in the University. He returned to Trinidad during World War II. He worked briefly on his father's dairy farm and after the war, he went abroad to continue his studies in veterinary medicine. In those days "vets" only treated horses and many people advised, "the days of horses are gone; we are now in the age of cars", but this did not discourage him. He graduated in 1948 and became known throughout the Caribbean for his unmatched skills as a "vet" who took care of horses, mules, cattle, water buffaloes, cats and dogs.

Dr. Bennett received many awards for his contribution as a pioneer in veterinary medicine and as the man who developed the buffalypso. Among these are the Chaconia Medal, Gold (1984) from the Government of the Republic of Trinidad and Tobago, and an Honorary Degree from the University of the West Indies (2001).

Dr. Bennett's advice to youngsters is to, "try and get in a field you really like because, it is the only way to excel."

## Key.Words

**BUFFALYPSO:** a word coined from the words 'buffalo' and 'calypso', to represent the special breed of cattle developed by Dr. Bennett.

**ANIMAL HUSBANDRY:** the art of rearing animals.

**TUBERCULOSIS:** a disease that affects the respiratory system primarily the lungs, but also other parts of the body.

## At the Cutting Edge

# Andre Cropper


## Computer & Electrical Engineer

*"I wanted to invent something of which no one else had yet thought..." - Dr. Andre Cropper*

***DR. ANDRE CROPPER*** wants to "change the way we look at TV." He is the mastermind behind a Flat Panel Display Touch Screen made from thin layers of laboratory produced diamond called Organic Light Emitting Diode (OLED).

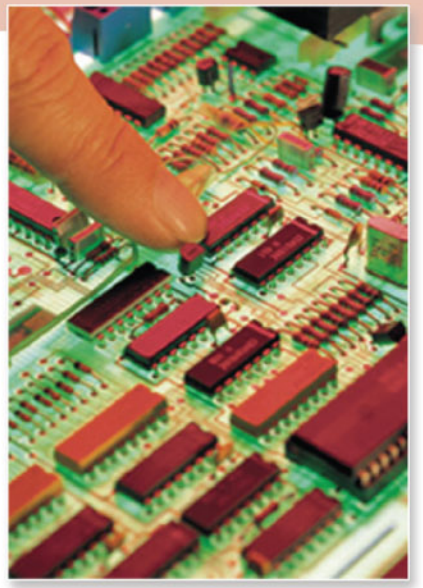
The display emits light and will allow display screens such as those in televisions, computers and mobile phones to be made as flat as a copybook and almost as light. They will be portable and need very little electrical power. Dr. Cropper holds two patents for the inexpensive manufacture of OLEDs for use in TV displays.

Andre Cropper was born on August 4th 1961. He grew up in St James, Trinidad. His curiosity was not discouraged at Newtown Boys' R.C. School or by his parents. At Fatima College, his secondary school, he was excited by mathematics and fascinated by physics. He knew he wanted to be an electrical engineer.

His agile scientific mind was balanced by his dedication to swimming. His days began at 4:30 a.m. at Flying Fish Pool where he swam laps before he went to school. He represented Trinidad and Tobago on its swimming teams in regional and international games during the 1970s.

At Howard University in Washington D.C., he was an outstanding student who was once asked to teach a graduate laboratory course. Although he was eligible for the Trinidad & Tobago swim team to the 1984 Olympics, he declined in order to complete his master's degree.

*Young Cropper at Swim Meet*



*Electrical Circuit Board*

He taught at Norfolk State University in Virginia and began research on the use of OLED as a semi-conductor. He presented this work to NASA (National Aeronautical Space Agency) which was impressed by the idea, but required that he have his Ph.D. In 1995, he obtained his Ph.D. in Electrical/Materials Engineering from Virginia Polytechnic Institute and State University in Blacksburg, Virginia.

He returned to Trinidad to teach at the University of the West Indies in the Department of Electrical Engineering. He then joined the Eastman Kodak Company in New York in 1999 to work on OLED applications and their varied uses in industrial and communications technologies.

Dr. Cropper has shared his knowledge through conferences and partnerships in several countries. He likes to engage young people in science through workshops at schools, universities and companies in the USA and his homeland. He enjoys swimming, scuba diving, reading, dancing, travelling, nature walks and the fine arts. He advises students to, "nurture a curious mind, ask questions on why and how and seek to find the answers... go to the library and read."

## Key.Words

**SEMI-CONDUCTOR:** a material, typically crystalline, which allows electrical current to flow under certain circumstances.

**FLAT-PANEL DISPLAY:** a thin, lightweight video display used in laptop and notebook computers.

**DIAMOND:** a structure made from the single element, carbon, that is extremely hard and difficult to break.

**TOUCH SCREEN DISPLAY:** allows users to access information by touching the display screen.


# John Ewen

## Research Chemist

*"I love to daydream, but the only way to get things done is by hard work..." - Dr. John Ewen*

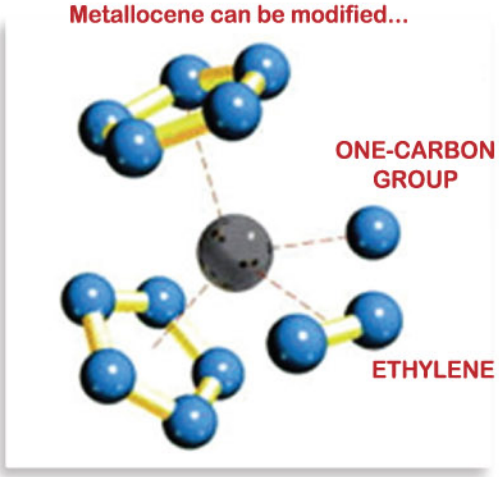
***DR. JOHN EWEN*** has made plastics more durable, heat-proof, tear resistant and transparent for use in many products including golf balls, food wraps, and automotive parts. One of his plastics allows oxygen to pass through, to keep salads and vegetables crisp without refrigeration.

Plastics are a multi-billion dollar industry worldwide. Dr. Ewen studied metallocenes as catalysts to allow plastics to be made with greater strength and flexibility. For his ground-breaking research on plastics, he received the prestigious National Medal of Technology from George Bush, President of the United States in 2002. Dr. Ewen credits his success to, "a love for chemistry, a love for doing research and all credit to the metallocenes."

John Ewen was born in Kingston, Jamaica in 1945. His family was at the forefront of the tourism industry in Montego Bay. While his parents managed hotels, he would play sports on the beach, swim, fish and ride his bicycle.

He was a boarder at high school - returning home only on vacations - and seemed to be unhappy there. He failed his first chemistry test and could not understand mathematics.

At the University of the West Indies at Mona, Jamaica, he developed a great love for chemistry. His mentor was Professor Gerald "Bunny" Lalor who developed his lifelong "fascination for all




*Metallocene Molecule*

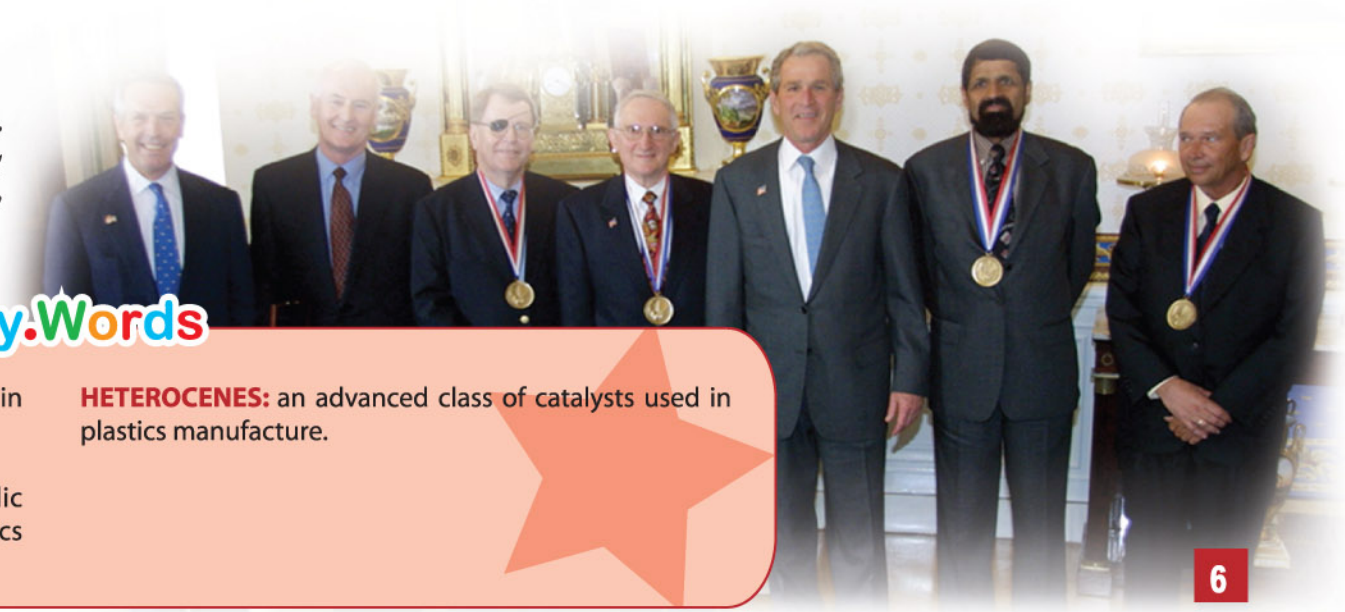
*National Medal of Technology*

aspects of chemistry" and his appreciation for research. He graduated from UWI with first class honours in 1972. In 1973 he migrated to the United States. He graduated from Tulane University, New Orleans with a doctorate in 1979.

His first job was at Exxon Mobile Chemical Company where he did research on the synthesis of plastics and pioneered work on metallocenes. He was faced with resistance to his novel research and was forced to work on weekends and holidays. He persevered, working long hours and in 1984, he published his first paper on the chemical control of plastic compounds using metallocenes.

He also started to educate the public on catalysts and the benefits of his new plastics. In time people realised the importance of this technology. He later developed the 'Ewen Symmetry Rules' which enabled plastics to be made for a diverse range of applications. Dr. Ewen retired as President of Catalyst Research Corporation, but he continues to work as a consultant and has started work on a new group of catalysts known as heterocenes.

His advice to young people is that: "Research is an exciting and interesting way to make a living and one must focus on the needs of society to make an impact." He also adds, "Pushing back the frontiers of science is highly rewarding and one can have a very satisfying life if you enjoy what you do".



*John Ewen with other recipients of the 2002 US National Medal of Technology*

## Key.Words

**CATALYST:** a substance that brings about change in other substances without itself being changed.

**METALLOCENES:** a special group of metallic compounds that are used as catalysts in plastics manufacture.

**HETEROCENES:** an advanced class of catalysts used in plastics manufacture.

Hope for Cattle

# Thomas Lecky


## Cattle Breeder

*"He is remembered as the father of the Jamaican Dairy Industry." - Dr. Rebecca Tortello, Professor of Education*

***DR. THOMAS LECKY*** developed three breeds of cattle suited to the tropics - Jamaica Hope, Jamaica Red and Jamaica Black. His particular cattle breeding technique forms the basis for breeding experiments worldwide.

Thomas Phillip Lecky was born on December 31st 1904 in Portland, Jamaica. He grew up on the slopes of the Blue Mountains and saw his neighbours struggle with poverty and poor farming practices. He knew he wanted to make a difference in his community.

At age 17 he attended the Government Farm School (Jamaica School of Agriculture) on scholarship. He worked as a bench chemist and then a livestock foreman at Hope Farm. He obtained a Diploma in Agriculture from MacDonald College, McGill University, Canada and a Bachelor of Science degree from Ontario Agricultural College (University of Guelph).

In 1934 he set up his own farm in Jamaica, breeding pigs and poultry but felt he was not using the full potential of his scientific training. Later, as Inspector of Livestock, Lecky proposed that the cattle varieties in Jamaica - mainly bred for size and strength to work on farms - should be developed. He experimented to produce breeds of smaller size to suit the country's hilly terrain and to meet its meat and milk production needs. He faced criticism that breeding would take generations and would not be completed in his lifetime. His pioneering efforts used accelerated natural selection, interbreeding only the best offspring from the most improved cattle. With this work he obtained his Ph.D. at


*Variety of Cattle*

*Receiving the Norman Manley Award*

Edinburgh University and became the first Jamaican to earn both undergraduate and postgraduate degrees in agriculture.

In 1952, he produced the significant dairy breed of cattle, Jamaica Hope, a symbol of hope for the poor of Jamaica. His Jamaica Red became the principal producer of beef for the local and export markets. This breed suited steep terrain and farmers with small hilly plots of land. The Jamaica Black was bred to suit cooler areas. The main impact of these breeds, which were exported to other countries, was an improvement in farmers' standard of living. Lecky also encouraged youth in agriculture.

He received the Order of the British Empire (1958) for his achievements and was the first recipient of the Norman Manley Award for Excellence (1970). He was bestowed an *Honoris Causa* degree from the University of the West Indies (1971) and Jamaica's Order of Merit (1997) just prior to his death.

## Key.Words

**BREEDING:** to develop new or improved organisms, chiefly by controlled mating and selection of offspring for desirable qualities.

**NATURAL SELECTION:** a natural process by which offsprings are produced with desirable characteristics best suited for their environment.


# Kenrick Lewis

## Research Chemist

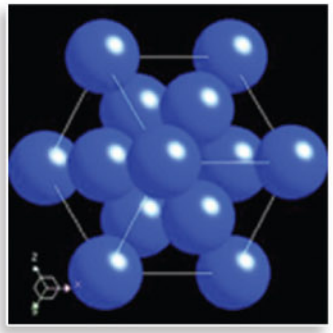
*"My wish for young persons is for them to become more creative, more inventive." - Dr. Kenrick Lewis*

***DR. KENRICK LEWIS*** is known for his contribution to the development of silicones and polyurethane. His silicone work involves using copper catalysts to create silicones from silicon. Dr. Lewis' research on polyurethane has produced a mathematical model to produce the ideal structure in foam manufacture. It is applied in foams used in refrigerators, cushions and in construction. Dr. Lewis is a Corporate Research Fellow with the OSi Specialties Group of GE Silicones in Tarrytown, New York.

Kenrick Martin Lewis was born in Gouyave, Grenada, on November 11th 1948. He attended the St. John's Anglican Primary School and the Grenada Boys' Secondary School on an Under 12 Scholarship. He participated in drama, singing and sports and was the president of the science club.

He entered university in Canada in 1967 on a British Commonwealth Scholarship. He obtained the B.Sc. in Chemistry from the University of Alberta in Edmonton (1971) and a Ph.D. in Inorganic and Analytical Chemistry from the University of Massachusetts (1976).

Dr. Lewis received many awards including being named a Key Contributor to his company's Kirkpatrick Award for chemical process innovation in 1999. Recently, the US National Society of Black Engineers awarded him the 2004 Golden Torch for lifetime contributions to technology.

*Silicon Metal and Atomic Structure*

*Young Kenrick Lewis*

Dr. Lewis has written several technical papers, co-edited a book on silicon chemistry, served on review panels of the National Science Foundation of the USA and contributed to research programmes involving his company and US universities. He belongs to several professional scientific societies including the American Chemical Society and the International Union of Pure and Applied Chemistry (IUPAC).

Since 1991 Dr. Lewis has sponsored the Dr. Aloysius Charles Scholarship Fund, which provides a top student in Grenada each year with financial support for five years of secondary schooling. He is the current Vice-President of the Grenada Boys' Secondary School Alumni Association, New York, which supports the school through donations and scholarships.

His advice to youngsters is: "Be curious. Begin with the vast outdoor laboratory available to you. Observe the plants, the animals, the sea and rivers and natural phenomena. Ask why and how events occur. Think of possibilities and set goals using the 'I wish I could approach'. Talk to people about your visions and read to seek information to fulfil them."

## Key.Words

**CATALYST:** a substance that brings about a change without itself being changed.

**POLYMER:** a substance with a structure made of many smaller similar units linked together.

**POLYURETHANE:** foam or fibre made from a combination of organic compounds.

**SILICON:** chemical element that occurs in many rocks and soils and in the structure of living organisms.


# Robert Rashford

## Design Engineer

*"If you have no challenges... you do not live." - Mr. Robert Rashford*

***ROBERT RASHFORD*** is an internationally known aerospace engineer who makes tools for use in outer space. He worked closely with a team of scientists to repair the first Hubble Space Telescope and restore its 20/20 vision. This telescope has been useful to our study of outer space and has taken pictures of never before seen stars, planets and galaxies.

Rashford also developed a method of testing equipment used on space shuttles and by astronauts during space missions. He manages his own company, Genesis Engineering Solutions Inc. and is currently working on the development of an instrument that will fly on board the James Webb Space Telescope (JWST) spacecraft. The JWST is designed to observe the first stars and galaxies in the universe and is a replacement for the Hubble Space Telescope.

*Hubble Space Telescope*

For his extensive work he received many awards including four awards from NASA for his work on the Upper Atmosphere Research Satellite and the Hubble Space Telescope. He also received an award for Excellence in Science and Technology from the Institute of Caribbean Studies.

Rashford was born in Kingston, Jamaica on June 15th 1957. His family was not well off and his creativity led him to make his own toys using simple things like cotton reels and cardboard. He enjoyed science and mathematics while at Waulgrove High School.

*Image from the Hubble*

In 1978, he went to live in the United States of America. He obtained a degree in engineering at Temple University and secured a master's degree at the University of Maryland in engineering and management.

Rashford's research led to the invention of a dry laser cleaning tool for flat panel displays in 2001. This tool replaces the use of 'wet' cleaning methods with harmful chemicals. Together with another scientist, Charles Rivera, Rashford invented the world's first portable "Non-destructive Evaluation System", which enables the detection of flaws in materials used in aircraft, pipelines and other structures without having to take these materials apart.

Rashford is now working in the field of nanotechnology developing very small circuits for use in computers. He believes the day will come when a computer can be rolled up and put in your pocket. He has many more visions of the future.

Today, he says to young people: "Expect challenges in your life; if you have no challenges, you do not live - use each one to motivate you to achieve great things."

## Key.Words

**LASER:** an intense, narrow beam of light used for very precise scientific purposes.

**NANOTECHNOLOGY:** 'nano' means very small; a measurement of one thousand-millionth; nanotechnology deals with extremely small things.

**HUBBLE TELESCOPE:** a high-powered telescope for investigating outer space. It is named after astronomer, Edwin P. Hubble.


# Cardinal Warde

## Physicist

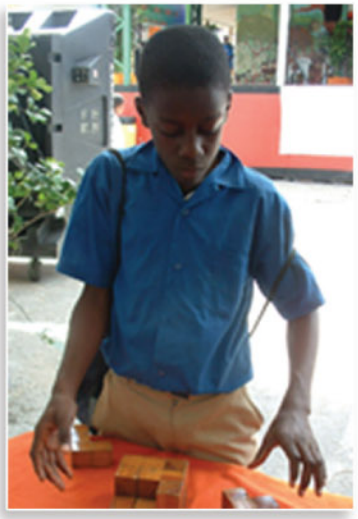
*"Growing up I thought there was nothing I couldn't do... I did everything to get the resources to make something happen." - Prof. Cardinal Warde*

***PROFESSOR CARDINAL WARDE*** is a world expert on optical information processing. He holds twelve patents and lectures at the prestigious Massachusetts Institute of Technology (MIT), USA.

One of his inventions is a pair of tiny display eyeglasses developed with Dr. Ali Ersen. It allows users to read manuals hands-free. The device can be useful to mechanics, paramedics and also surgeons during operations. Video games and 3-D virtual reality are among other possible uses.

Born on July 14th 1945, Warde grew up in Barbados near the beach where he fished and played cricket. He attended St. Christopher's Boys School until age 10 then moved to the Foundation School. From age 16, he attended Harrison's College pursuing mathematics, chemistry and physics. He excelled academically and represented his school in track and field events.

At a young age, he took apart items to see how they worked. After the launch of the first space satellite, he and two friends decided to construct a rocket. They researched materials and fuel chemicals needed to build the rocket while transforming his father's workshop into a science laboratory. They launched the rocket at the beach with a mouse on board but the rocket made it only 3 metres off the ground! Not discouraged, they continued experimenting in the lab.



*Creative Exploration*

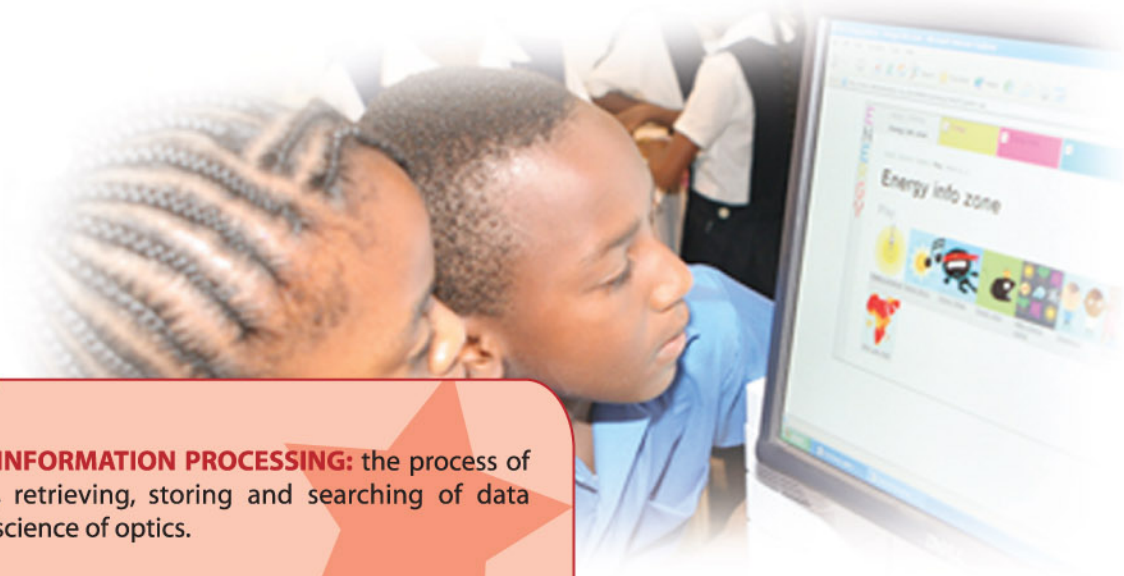
*Warde receiving the Companion of Honour Award*

Warde obtained his bachelor's degree in physics from Stevens Institute of Technology, USA (1969) and played on its soccer team. He attained both master's (1971) and doctoral degrees (1974) in physics at Yale University and joined the Faculty of MIT as Assistant Professor of Electrical Engineering.

Presently, he is working on building computers with brain-like functions to make 'judgement calls' like humans. He has collaborated with NASA to develop optical imaging devices for the US government. For his outstanding work in science and technology, the Barbados Government awarded him the Companion of Honour in 2003 and the US Black Chamber of Commerce named him Innovator of the Year, 2001.

Professor Warde is an adviser to the Ministry of Education in Barbados - a service he performs at no cost. In the US and Barbados, he encourages students to pursue careers in science and technology. He advises youngsters to build a strong base in mathematics and communication skills for a career in the sciences.

To kids he says: "Put a great effort at all levels of your studies and don't be afraid of mathematics - it is not as mysterious as it seems."




## Key.Words

**OPTOELECTRONICS:** a branch of electrical engineering that deals with electronic devices that emit, regulate, transmit and sense light.

**OPTICS:** the branch of physics that deals with light and vision.

**OPTICAL INFORMATION PROCESSING:** the process of gathering, retrieving, storing and searching of data using the science of optics.


# George Alleyne

## Medical Researcher

*"Success is 1% genius and 99% elbow grease." - Sir George A.O. Alleyne*

***SIR GEORGE ALLEYNE*** is a distinguished Barbadian whose contributions to Caribbean medicine are punctuated with many 'firsts.' He was the first Caribbean director of the Pan American Health Organization and the first graduate of the University of the West Indies (UWI) to hold the title of Chancellor.

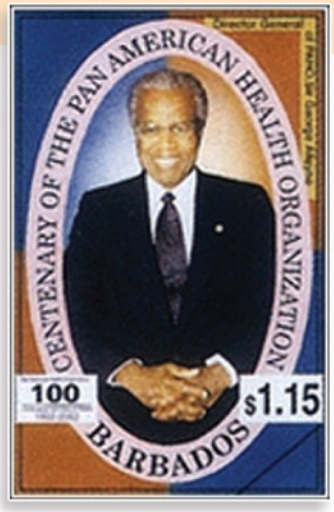
Her Majesty Queen Elizabeth II knighted him in 1990 and in 2001 he received the Order of the Caribbean Community. After retirement, Sir George headed a special team of the Caribbean Health Task Force to combat HIV in the region.

George Alleyne was born on October 7th 1932 in St. Philip, Barbados. He attended Holy Trinity Boys' School and Harrison's College. He received an island scholarship in 1951 to study medicine at the University College of the West Indies at Mona, Jamaica.

He graduated in 1957 as a gold medalist with the Bachelor of Medicine and Surgery degrees and did his internship at the Old General Hospital, Barbados. He gained his doctorate in internal medicine at the University of London in 1965. He then began lecturing at UWI, Cave Hill and conducted research on malnutrition at the Tropical Metabolism Research Unit, Jamaica.

After a decade of extensive original research, producing several scientific papers he was appointed Professor of Medicine at age 40. Four years later he was promoted to the Chair of the Department of Medicine - the first UWI graduate to achieve this distinction.

*AIDS awareness ribbon*




*Sir George's achievements*

His greatest joy was teaching young persons and he developed a formal postgraduate programme encouraging medical research. From 1981 to 1990, he worked at the Pan American Health Organization (PAHO) and became its Director in 1995. He served on several international committees including the Scientific and Technical Advisory Committee of the World Health Organization Tropical Research Programme and the Institute of Medicine Committee on Scientific Investigation in Developing Countries.

Among the many awards he has received, are the Pelican Award from UWI and the Centenary Medal in Jamaica. He holds several honorary academic awards and in 2003, he became the UWI Chancellor.

Sir George Alleyne has served the people of the Caribbean for over four decades. His motivation for success is simple, "hard work and discipline". He has lived by the words of one of his mentors who advised: "Do not make plans, do what you have to do and do it well, giving your best and everything will be OK."

## Key-Words

**HIV:** human immuno-deficiency virus; the virus that can cause breakdown of the human body's natural defense system and lead to AIDS.

**METABOLISM:** the chemical changes in a body that break down substances for growth and energy.

**SANITATION:** conditions affecting cleanliness and protection against infection.

**MALNUTRITION:** a condition resulting from the lack of foods needed for health.

# Ciprian Amoroso


## Biologist

*"There could be no other satisfying life than the life of a scientist." - Prof. Ciprian Amoroso*

***PROFESSOR CIPRIAN AMOROSO*** gained international recognition for his seminal work on the structure and function of the placenta. His research was published in Marshall's Physiology of Reproduction (1952) and built his reputation as a leading reproductive biologist.

Emmanuel Ciprian Amoroso was born in Woodbrook, Trinidad on September 16th 1901. He attended Newtown Boys' R.C. School and St Mary's College. He participated in the arts and sports at school. At age 17 he left school due to failing eyesight, which persisted throughout his life. When it slightly improved, he studied on his own and taught at the College.

At age 21, he began studying medicine at the University College Dublin, Ireland. He sold newspapers and worked in the lab to cover costs and became a boxer. He won many academic prizes and tutored classmates. He graduated with a Bachelor of Science degree in 1926 and a Bachelor of Medicine and Surgery degree in 1929.

*Developing baby and placenta in the womb*

Amoroso spent two years in Germany studying at Albert-Ludwigs University, Freiburg and Kaiser Wilhelm Institute for Cell Research, Berlin on a Travelling Studentship from the National University of Ireland. In 1934 he received his Ph.D. from the University College, London.

He then joined the Royal Veterinary College and researched cell structure and function. He also studied the early growth and development of living organisms. Despite racial prejudice and

*A newborn squirrel*

jealousy, he excelled and his career blossomed. The College focused on horse diseases but slowly extended its research to domestic and exotic animals through his work.

Amoroso studied the nervous and circulatory systems, organ development, respiration and reproduction in various animals. He also investigated what prevents blood rushing to the head of animals with long necks (like the giraffe) as they lower their heads to drink water.

He spoke six languages and was an excellent educator who made an art of lecturing. He held the post of Chair of Veterinary Physiology at the College from 1947 until his retirement in 1968. It is said that he led the finest department of veterinary physiology in England and was conferred the title of Professor Emeritus.

He was the only West Indian elected to the Fellowship of the Royal Society of England and he received several honorary doctorates. He was named Commander of the Order of the British Empire and cherished the Trinity Cross, awarded by the Government of Trinidad and Tobago. Well into retirement, he continued research and published his last paper at age 80. He died in 1982.

## Key Words

**PLACENTA:** the organ in the womb through which the young mammal is nurtured in the mother's body.

**PHYSIOLOGY:** the branch of science that deals with the normal functioning of living things.

**ANATOMY:** the science of the structure of the bodies of humans, animals and plants.

# Courtenay Bartholomew


## Medical Researcher

*"To thine own self be true and thou canst not then be false to any man" - William Shakespeare*

***PROFESSOR COURTENAY BARTHOLOMEW*** diagnosed the first case of AIDS in the English-speaking Caribbean. Founder and director of the Medical Research Foundation of Trinidad and Tobago (MRFTT), he leads HIV vaccine trials and research on cancer and retroviruses with US institutions. A member of the World AIDS Foundation Scientific Advisory Committee, he promotes public education on AIDS. He is also an international bioethics adviser.

Professor Bartholomew was first reputed for his research on internal diseases. He researched scorpion sting venom and acute pancreatitis (inflammation of the pancreas). He completed one of the world's largest country surveys on Hepatitis A and B in Trinidad and Tobago (1982). He was the first local physician to receive Membership of the Royal College of Physicians, London without examination. He holds Fellowships from the Royal Colleges of Ireland, Edinburgh and London.

Courtenay Felix Bartholomew grew up in Port of Spain, Trinidad. He attended Nelson Street Boys' R.C. School and St. Mary's College, where he excelled in biology and chemistry. His dislike for physics, however, reduced his chance of gaining a science scholarship. He left school after Lower Sixth Form, intent on pursuing medicine. This dream was inspired by his admiration for Dr. Alwyn Francis and an uncle who was prevented from becoming a doctor due to racial prejudice in Canada.

Bartholomew worked before gaining acceptance to the University College Dublin (UCD), Ireland in 1954. He interned at St. Vincent Hospital and graduated in 1960 with an internal medicine specialisation. He

*Stained-glass windows*

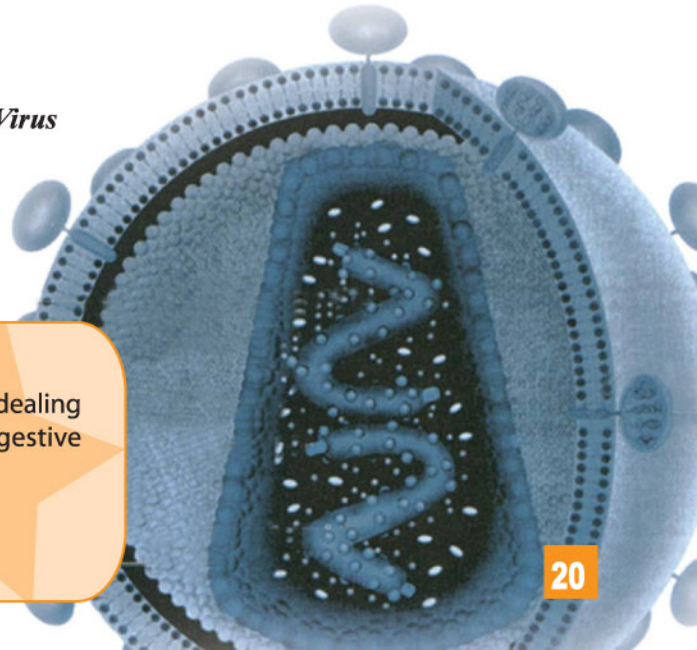
received a speciality degree in gastroenterology (1964) and a doctorate in medicine from the National University of Ireland (1965).

Returning to Trinidad, he became the first UWI lecturer in Medicine (1967) and later first Professor of Medicine (1977). As the Honorary Consultant, Internal Medicine and Gastroenterology at Port of Spain General Hospital (a post he held for 20 years), he pioneered new approaches to diagnosing bowel diseases. He was an external Examiner for University of Ibadan, Nigeria and Visiting Clinical Professor at the Liver Unit, University of Miami and Royal Victoria Hospital, McGill University.

For his outstanding achievements, he received UCD's highest honour of Honorary Fellowship of the Faculty of Medicine (2004) and the International Human Retrovirology Society Award (1991).

Professor Bartholomew has restored historic churches in Trinidad and authored several books on the Blessed Virgin Mary. He encourages students to, "be good at whatever you do." He notes that, "teachers are there to guide and motivate" and advises good use of libraries. He urges budding scientists to, "be inquisitive to want to learn more."

*AIDS Virus*



## Key-Words

**BIOETHICS:** the discipline which deals with the moral issues in biological research and applications.

**RETROVIRUS:** a virus which merges with the cell that it infects.

**GASTROENTEROLOGY:** the branch of medicine dealing with the study of disorders affecting the digestive system.

## The Community Surgeon

# Cecil Cyrus

## General Surgeon


*"Life is beautiful. To preserve life is beautiful." - Unknown Author*

***DR. CECIL CYRUS*** is considered a St. Vincent hero who improved the health and welfare of his countrymen. He strongly believes in 'making do' and devised new tools to facilitate his surgical work. For his medical book, "A Clinical and Pathological Atlas: The Records of a Surgeon in St. Vincent, The West Indies", he was awarded the Master of Surgery degree from Queen's University, Belfast.

Arthur Cecil Cyrus was born on January 6th 1929 in Layou, St. Vincent. As a boy, he learnt that the visiting district doctor tended, "only those with a shilling". This social inequality inspired him to become a doctor. He attended Layou Government School, Kingstown Anglican School and later St. Vincent Boys' Grammar School. He taught himself the science subjects for Cambridge examinations and in record time obtained distinctions in chemistry and biology and a pass in physics.

In 1950 he entered Queen's University in Ireland. He was the first overseas student to win the Symington Medal in Anatomy among other prizes. He gained the Fellowship of the Royal College of Surgeons (FRCS) of England and Edinburgh. He specialised in other areas of medicine before returning home in 1963.

Dr. Cyrus was appointed Consultant Surgeon to the Colonial Hospital. In spite of shortages of staff, equipment and basic facilities, he worked tirelessly to clear the


*Cyrus' Museum of Medical Specimens*

*Dr. Cyrus at his Museum's opening*

patient backlog. The island's first trained surgeon, he did the work of many specialists to restore dignity to patients affected by disfiguring tumors and sores. He obtained diplomas in ophthalmology and obstetrics and opened the private Botanic Hospital in 1976.

Over 25 years, he recorded the diversity and grossness of diseases in a collection of photographs, specimens and x-ray images. After retirement (2001), he converted his clinic into the "Dr. Cecil Cyrus Museum" to display part of his collection and unique medical instruments.

Dr. Cyrus introduced squash to St. Vincent in 1966 and supported its promotion. He sponsored with his wife the first Caribbean Junior Championships. St. Vincent produced several regional champions and the International Olympic Committee specially commended him for his efforts.

He received other awards including the Order of the British Empire and the Companion of the Most Excellent Order of Saint Michael and Saint George (CMG). A former Deputy Governor-General of St. Vincent and the Grenadines, he was honoured by the Pan American Health Organization and his image appears on a commemorative stamp. He keeps active, delivering public lectures and publishing medical papers.

## Key.Words

**TUMOR:** an abnormal growth of tissue resulting from uncontrolled multiplication of cells.

**PATHOLOGICAL:** relating to or caused by disease.

**OPHTHALMOLOGY:** a branch of medicine dealing with the structure, functions and diseases of the eye.

## Rebuilding the Body

# John Golding

## Orthopaedic Surgeon


*"One of the towering figures of Jamaican society in the latter half of the century."*
*- Peter D. Phillips, Minister of Health, Jamaica*

***SIR JOHN GOLDING*** was an expert in tropical orthopaedic medicine who assisted disabled persons to lead normal lives. He was respected throughout Jamaica and the Caribbean as an exceptionally skilled surgeon. His work led him to establish many avenues for the rehabilitation of disabled persons in Jamaica, including the Polio Games (1966), the forerunner of the Special Olympics.

John Simon Golding was born in London on April 15th 1921. He was educated at Marlborough College, then at Caius College, Cambridge. He qualified in medicine at Middlesex Hospital, London in 1944.

He first worked with the Royal Army Medical Corps in the village of Tobruk (1946-1948) where he was the only doctor for hundreds of miles. He gained the Fellowship of the Royal College of Surgeons in England in 1949 and was the Registrar at the Royal National Orthopaedic Hospital for two years. There he practised and studied under Sir Gordon Taylor who was considered the 'Father of Modern British Orthopaedic Surgery'.

Despite the prospect of a successful career in Britain, Golding came to Jamaica in 1953. He was appointed Senior Lecturer to the first group of medical students at the University College of the West Indies. His area of speciality was medical ethics, and his background in orthopaedics enabled him to establish the School of Physical Therapy.

*Girl with crutches*

*Sir John with Paralympics Team*

He decided to stay in Jamaica six months after his arrival. A recent epidemic of poliomyelitis left about 1,500 persons severely paralysed and Golding realised they had little hope of becoming 'normal' again. He established a rehabilitation centre at Mona to take care of patients' broken limbs and helped to mend broken spirits. He also built a workshop that provided skills training and jobs in diverse fields ranging from the making of crutches and wheel chairs to livestock rearing.

Golding's other initiatives were the Hope Valley Experimental School, which allowed disabled children the opportunity to attend school with other children, and hospices, which cared for the terminally ill, free of charge.

For his work in polio rehabilitation and tropical orthopaedics, he was appointed Commander of the Order of the British Empire (1959) and received the Order of Jamaica (1974). Her Majesty Queen Elizabeth II knighted him in 1986. Sir John died on March 23rd 1996. He lived according to his favourite maxim: "The greatest of all mistakes is to do nothing because you can only do a little."

## Key Words

**ORTHOPAEDICS:** the branch of medicine that deals with the prevention or correction of injuries or disorders of the skeletal system and associated muscles, joints, and ligaments.

**REHABILITATION:** to restore to good health or useful life, as through exercise and education.

**POLIO/POLIOMYELITIS:** a disease that chiefly affects children and causes swelling of parts of nerves in the spinal cord and brainstem, leading to paralysis and often deformity.

# Kenneth Standard


## Public Health Doctor

*"Professor Emeritus Sir Kenneth Standard is an alumnus that makes us proud."*
*- Rex Nettleford, Vice-Chancellor, UWI*

***SIR KENNETH STANDARD***, Professor Emeritus of the University of the West Indies (UWI), pioneered teaching and training in public health in the Caribbean. He started academic programmes at UWI Mona in public health for physicians and in community health for non-physicians. He also introduced community medicine in the undergraduate curriculum and developed the Community Health Aides programme for the Ministry of Health, Jamaica.

Kenneth Livingstone Standard was born in Barbados on December 8th 1920. He attended Harrison College and won a Senior 1st Grade Scholarship. He taught at Lynch's Secondary School in Barbados and became the school's headmaster.

He was among the first batch of 33 medical students of the University College of the West Indies (UCWI) in Mona, Jamaica. After graduation, he worked at the University College Hospital. Standard attended the Graduate School of Public Health, University of Pittsburgh and attained his master's degree in public health in 1959. In 1962 he obtained a doctorate in medicine from the University of London for research on child nutrition.

*Immunization exercise*

He placed high importance on community health and began his career as a Medical Officer of Health in Barbados in 1958. In 1961 he joined the Department of Social and Preventative Medicine at UWI Mona, Jamaica. He was appointed Head of Department in 1966 and was elevated to Professor in 1968. He attained Jamaican citizenship in 1973. Professor Standard

*Kenneth Standard being Knighted*

initiated a health aides programme in August Town, Jamaica. In this project, volunteer doctors and nurses conducted short courses to train residents in health care. He also set up a clinic at Mona run by UWI medical students to assist neighbouring communities. This gained the attention of Cornell University, USA.

He made regional and global contributions as a consultant to the Pan American Health Organization / World Health Organization (PAHO / WHO). He chaired the WHO Task Force on Research in Health Education in Family Health and was a long-serving member of the WHO Expert Advisory Panel on Public Health Administration. His manual for community health workers is considered the 'bible' of social and preventative medicine.

The Jamaican Government awarded him the Commander of the Order of Distinction (1976). He received the Order of Knight Bachelor from Her Majesty the Queen (1982) in recognition of his invaluable work in Public Health and PAHO named him a 'Public Health Hero of the Americas' (2002). Professor Standard died in August 2004.

## Key.Words

**PUBLIC HEALTH:** the science of protecting and improving community health through preventive medicine, sanitation and education.

**PREVENTIVE MEDICINE:** a branch of medical science dealing with methods (e.g. vaccination) of preventing the occurrence of disease.

**COMMUNITY MEDICINE:** public health services emphasizing preventive medicine and control of disease for members of a given community.

# Cicely Williams

## Paediatrician


*"... misguided propaganda on infant feeding should be regarded as murder. . ." - Dr. Cicely Williams*

***DR. CICELY WILLIAMS*** qualified as one of Britain's first female doctors and the first female Jamaican doctor in 1923. She first diagnosed the protein deficiency condition known as Kwashiorkor and developed a treatment regime. Considered one of the 20th Century's greatest discoveries, she was awarded the Ceres Medal by the World Health Organization (WHO). Dr. Williams also initiated a global campaign against the use of sweetened condensed milk as a breast milk substitute.

Cicely Delphine Williams was born in Westmoreland, Jamaica on December 2nd 1893. At age nine, her father encouraged her to go to Oxford to become a 'lady doctor.' In 1916 she entered Somerville College, Oxford as one of Britain's few female students. After graduation she joined the South London Hospital for Women and Children and specialised in paediatrics.

She became the first female medical officer appointed to the Colonial Medical Service in the Gold Coast (Ghana) in 1929. She worked tirelessly to transform the health care system and established a proper hospital with clinics to educate mothers on breast-feeding, nutrition and proper childcare.

In 1932, her compassion for the poor led her to observe that children were succumbing to a 'mystery illness'. She discovered this was due to severe protein deficiency termed Kwashiorkor. She recommended a special diet of high protein beans and educated parents on proper nutrition,

*Breast-feeding mother and child*

*Williams with baby*

saving lives there and around the world. She was elected Member of the Royal College of Physicians, London without examination (1935) and received an honorary doctorate from Somerville College.

From 1936 she spent ten years in Malaya lecturing and treating patients. During World War II she was captured and spent three years imprisoned. She was starved, tortured and subjected to inhumane conditions. She almost died from severe illness, but continued to treat fellow prisoners and successfully cared for twenty babies born at the prison camp.

After her release she returned to Jamaica and researched a cure for 'vomiting sickness' caused by ackee poisoning. For her service to medicine she became the first recipient of the Jamaican Government's Order of Merit and the Companion of the Order of St. Michael and St. George.

Dr. Williams later returned to Malaya, the first woman to head maternal and child welfare services. From 1948-1951 she was a WHO advisor. She lectured at Oxford University, the University of the West Indies, Mona and universities in Europe, Beirut and the USA. Well into her nineties, she remained active in child health promotion. She died in England in 1992.

## Key-Words

**PAEDIATRICS:** the branch of medicine concerned with the treatment of infants and children.

**KWASHIORKOR:** severe malnutrition in children resulting from a diet excessively high in carbohydrates and low in protein.

## A Master of Soils

# Nazeer Ahmad


## Soil Scientist

*"The soil does not belongs to us but to our children ... " - Prof. Nazeer Ahmad*

***PROFESSOR NAZEER AHMAD*** is a world recognised expert on tropical soils. His work has provided the Caribbean and other areas with a better understanding of the properties of their soils, what uses they should be put to, and how they could be managed to support higher crop yields. He was awarded the Gold Medal by the Inter-American Institute for Cooperation in Agriculture for his contributions.

Nazeer Ahmad was born on January 27th 1932 in Dundee, Guyana. His days started at 4 a.m. tending livestock and planting crops on his family's farm. At age nine he learnt from his teacher about fertilizers and soil types to achieve increased crop yields and became interested in learning about soil management.

He attended Novar Canadian Mission School and Berbice High School. After only three years, he gained a grade one pass in the Cambridge School Certificate and attended the Imperial College of Tropical Agriculture (ICTA) in Trinidad on a British Guiana Agricultural Scholarship. He graduated with the Diploma in Agriculture (1951) and Postgraduate Associateship (1952) from ICTA. He pursued a M.Sc. in Soil Science at Mc Gill University in Canada and a Ph.D. degree at University of Nottingham in the U.K. (1957).

*Ahmad conducting soil survey*

Ahmad headed the Division of Agricultural Chemistry in the Ministry of Agriculture, Guyana. He conducted soil and land use surveys to help improve agricultural productivity in Guyana and other

*Tropical soil profile*

parts of the Caribbean and Latin America. His definitive work was published in the book 'Soil Genesis and Taxonomy' (1983). He also has over 200 publications and contributions to three books.

He joined the School of Agriculture, University of the West Indies (UWI), Trinidad in 1961. He improved soil research and teaching facilities and built a sophisticated Soil Science Department. He developed a postgraduate school of research and supervised over 100 students. In 1996 he was appointed Professor Emeritus of Soil Science at UWI.

Professor Ahmad was the Director of the National Agricultural Research Institute, Guyana for five years until retirement in 2000. He also served the International Board for Soil Research and Management and the International Society of Soil Science, and was a Fulbright Professor at University of Illinois, USA.

This active consultant enjoys woodwork, auto mechanics and gardening. He advises children to: "Have balance in education choices; a basic science background gives opportunity to be flexible in choosing a career. Use your God-given attributes to the optimum."

## Key.Words

**SOIL SCIENTIST:** studies the physical, chemical and biological properties of soils in relation to their use and management.

**SOIL TAXONOMY:** is a system of classification that tries to group similar soils into general categories.

**SOIL MANAGEMENT:** protects and enhances the performance of soils to enable profitable farming and the preservation of environmental quality.

## Einstein of the Caribbean

# Rudranath Capildeo


## Mathematician

*"...all he touched had a mark of distinction." - Prof. E.A. Powers*

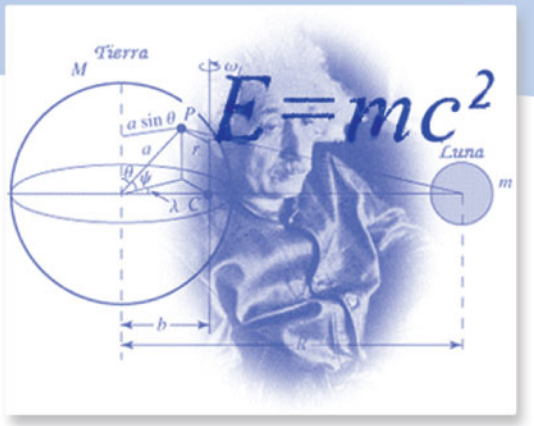
***DR. RUDRANATH CAPILDEO*** was a Trinidadian scholar who made contributions in the fields of applied mathematics and physics. He studied the nature of space and time and this sparked his interest in understanding Albert Einstein's Theory of Special Relativity. His work resulted in new theories, such as the "Theory of Rotation and Gravity" or "Capildeo's Theory" for short. This theory had applications in early outer space expeditions in the 1960s and 1970s.

Capildeo was a gifted educator who spent most of his teaching life at the University College London. He also taught at other institutions including the University of Khartoum, Sudan and he was the first principal of Trinidad Polytechnic School. He wrote a mathematics textbook entitled "Vector Algebra and Mechanics: Theory, Problems & Solutions".

Rudranath Capildeo was born in Chaguanas, Trinidad on February 2nd 1920 at "The Lion House". He attended Queen's Royal College (QRC) and won an Open National Scholarship in 1939. He began studies in medicine at Oxford University, but due to illness, he switched to mathematics at University College London.

He completed an intermediate bachelor of science degree and followed with a B.Sc. Special Degree in Mathematics. He copped several prizes and graduated in 1943. Capildeo returned to Trinidad and taught mathematics at QRC for a brief period. He furthered his studies at University College London and gained a Master of Science degree in 1945 and a Doctorate in Mathematical Physics in 1948.

*The Capildeo family. Rudranath standing far left*

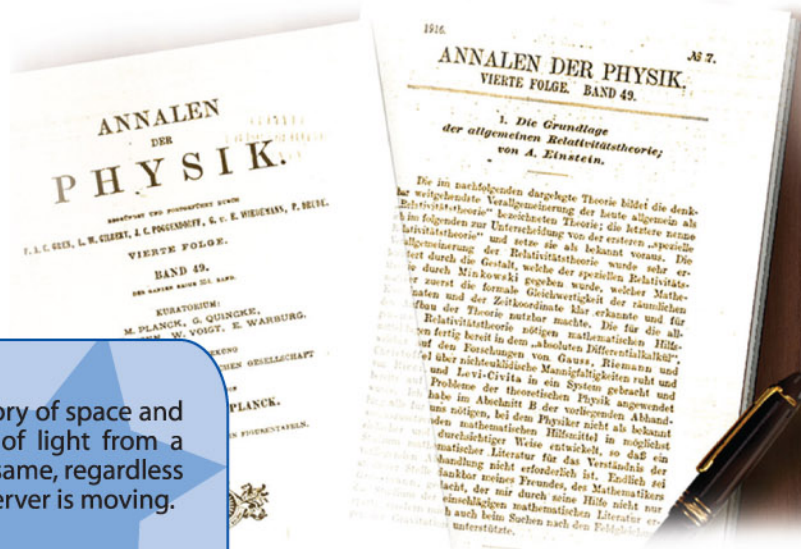



*Albert Einstein and the Theory of Relativity*

His ability to manipulate mathematical techniques enabled him to solve any problem. His logical mind, skill in debating and clear understanding of his subject assisted him in explaining complicated mathematical theories to his students and lay people. He proceeded to clarify and fortify Einstein's Theory of Special Relativity because he "knew it inside out, upside down and sideways".

Apart from his achievements in science, Dr. Capildeo studied law in London and was admitted to practise as a Barrister-at-Law in Trinidad. He founded and led the Democratic Labour Party and became Leader of the Opposition in the Trinidad & Tobago Parliament when the country became independent.

He was considered an outstanding scholar, yet, the full potential of his work is not fully understood. For his great achievements in science, he was awarded one of the inaugural National Awards - the Trinity Cross - from the Government of Trinidad and Tobago in 1969. He died on May 12th 1970.




## Key.Words

**APPLIED MATHEMATICS:** the branches of mathematics that are involved in the study of the physical, biological or sociological world.

**VECTOR ALGEBRA:** the part of algebra that deals with the theory of vectors and vector spaces.

**SPECIAL RELATIVITY:** the physical theory of space and time. It puts forward that the speed of light from a uniformly moving source is always the same, regardless of how fast or slow the source or its observer is moving.

## Blending the Arts and Science

# Edsel Edmunds


## Nematologist

*"All disciplines are grounded in Science." - Dr. Edsel Edmunds*

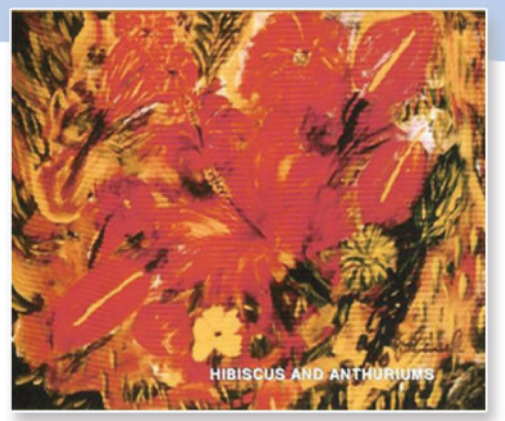
The scientist, ***DR. JOSEPH EDSEL EDMUNDS*** is also an artist, poet, educator, and diplomat - a true Renaissance Man. This plant nematologist developed control measures for crops affected by roundworms in Trinidad and the Windward Islands. His expertise was sought after by international organizations in the South Pacific, Africa, Latin America and the Caribbean.

After 18 active years in science, he was appointed Ambassador of St. Lucia to the United Nations, the Organization of American States and the United States of America. He was St. Lucia's first resident ambassador in Washington, D.C.

Edsel Edmunds was born on July 1st 1935. He attended the Roman Catholic Boys' Primary School and St. Mary's College, St. Lucia. He was fascinated by nature and conducted experiments with plants and dissected dead animals. At school, he played cricket and football, and excelled in his studies. He did the sciences externally and later pioneered the teaching of biology and zoology at his alma mater.

While contemplating studying law or medicine, he accepted a scholarship to the University of Puerto Rico, where he attained a Bachelor of Science degree in Agriculture. On scholarship to Cornell University, USA, he obtained the Master of Science in Plant Pathology (1963) and Ph.D. in Nematology (1965). His thesis investigated the interaction of nematodes with fungi and their role in plant diseases.

*Nematode or Roundworm*




*One of Edmund's paintings*

He then became a Research Fellow at the University of the West Indies (UWI), Trinidad and contributed to nematode control in citrus nurseries and plantations. At the Windward Islands Banana Growers' Association (WINBAN), he investigated damage to bananas by nematodes. He conducted the first comprehensive survey of nematodes affecting crops and was appointed Director of the Research and Development Center for the banana industry.

He received numerous honours including the Order of the British Empire (OBE) for his contribution to science. The nematode *Longidorus edmunsi* was named in his honour by an English nematologist in 1977.

For leisure, Dr. Edmunds writes poetry and paints. Though not formally trained in art, he paints according to 'scientific principles' using unusual materials such as ice, humus, ash, and aluminium foil. He practises Reflexology (a technique for relaxation through foot massage) and Reiki (transmitting healing energy through the hands).

His philosophy is 'Global Humanism' believing, "basic scientific principles should be used to solve the problems of today." He believes that: "a disciplined mind will allow you to overcome everything". He adds that, "there is no end to learning; it should be a continuous process."

## Key.Words

**NEMATOLOGIST:** a scientist who studies the nematoda, a class of worms that includes roundworms, hookworms, pinworms, etc.

**PATHOLOGY:** the branch of medicine that deals with the laboratory examination of samples of tissue for diagnostic purposes.

**RENAISSANCE MAN:** an intellectual who has broad interest in the arts and sciences.

# Oliver Headley

## Research Chemist


*"The sun will still shine when the oil runs out." - Prof. Oliver Headley*

***PROFESSOR OLIVER HEADLEY*** advocated the use of alternative energy sources, especially solar energy throughout the Caribbean. In the 1960s, he pioneered solar energy for heating purposes and crop drying. His greatest achievement was the design of the first and largest electrical grid system using solar energy, installed at Harrison's Cave, Barbados.

Oliver Headley was born on July 5th 1942 in St. Peter, Barbados. He was a curious, creative child who dismantled, rebuilt things and designed rockets. He attended Harrison's College and later began studies in physics at the University College of the West Indies, Jamaica then switched to chemistry. An avid swimmer and member of the University Water Polo Team, he obtained the Bachelor of Science degree in Special Chemistry. He gained his doctorate in 1967 from the University College London.

He then joined the Chemistry Department, University of the West Indies (UWI), Trinidad and later became a lecturer in the Faculty of Engineering. He investigated various applications for solar energy and was conferred the title Reader in Solar Energy for his extensive research and publications (over 100 scientific papers) in this field.

In 1992 he was appointed Professor of Chemistry, UWI, Cave Hill and he merged the Departments of Biology and Chemistry to form the Centre for Resource Management and Environmental Studies (CERMES).

*Headley demonstrating solar cells*

*Photovoltaic cells at Harrison's Cave, Barbados*

Headley's innovations on photovoltaic cells and solar still designs were used throughout the Caribbean and Central America. He devised a power system for the Government Headquarters and Barbados Power & Light Company. His solar cells were used to generate electricity to computers, laboratories, buildings and icemakers on fishing boats. He built numerous solar dryers for timber, sugar cane and other produce used in Grenada, Guatemala, Belize and El Salvador.

He was the Director of the International Solar Energy Society and had interests in tapping thermal energy from the deep ocean. For his tireless work, he received the World Renewable Energy Network Pioneer Award, the UWI Vice Chancellor's Award and the Barbados Companion of Honour among other awards.

Headley's students admired his enthusiastic teaching style and sense of humour along with his habit of using his palm as a calculator. He was also a respected elder of his local church. He enjoyed reading, photography, cycling, swimming and hiking, and sang in the University Choir. He passed away in 2002.

## Key.Words

**ALTERNATIVE ENERGY:** usually denotes energy from renewable sources such as the sun or energy from alternatives to "fossil fuel" such as coal, oil, and natural gas.

**PHOTOVOLTAIC:** capable of producing electricity when exposed to radiant energy, especially light. Photovoltaic cells are thus solar energy generating cells.

**SOLAR ENERGY:** energy directly from the rays of the sun.


# Colin Hudson

## Agronomist and Environmentalist

*"I believe deeply and sincerely in a web of life and the wonder of information which surrounds and supports us all." - Dr. Colin Hudson*

Although ***DR. COLIN HUDSON*** was recognised for machines and inventions for agriculture, he is better known for helping people to appreciate and enjoy the world of nature. He will be remembered in Barbados for the gardens, exhibits and restaurant at his home in Edgehill Plantation. He encouraged backyard gardeners to "reduce, reuse, recycle" and conducted activities such as the weekly 'Stop and Stare' nature hikes on behalf of the Barbados National Trust.

After the 1994 UN Conference on Small Islands, he made a permanent home for the 'Village of Hope' in the "backyard" of his home. He called it the Future Centre Trust, and it is full of examples of organic farming, alternative energy, and water recycling. The theme is extended to several interactive exhibits in the old plantation house. Hudson hoped that this model could be turned into a travelling exhibition to other parts of the world.

John Colin Hudson was born on January 15th 1938 in England. He came to Barbados as a Cambridge University graduate on contract with the Ministry of Agriculture. At the end of this contract, he stayed to work in the sugar cane industry and was instrumental in setting up the Agronomic Research Unit.

He obtained his doctoral degree in agronomy from the University of the West Indies, St. Augustine and was considered an expert in the sugar industry in Barbados. He wrote several scientific papers related to soils, cultivation and the general agronomy of the

*Sugar cane plantation*

*Hudson at the Future Centre Trust*

sugar cane crop. Dr. Hudson was very creative and when working at the company Carib-Agro Industries Limited, his inventive efforts led to the development of a harvester for sweet potato, planters for yam and cassava, a loader for small farms, and precision fertilizer instruments. This resulted in the granting of more than 20 patents for inventions which were used around the world.

He was recognised by the Barbados Association of Professional Engineers with honorary membership even though he was not a certified engineer. He was awarded Barbados' third highest national honour, the Gold Crown of Merit in 1994, for his contributions to the sugar cane industry and the environment.

Dr. Hudson enjoyed music. He played the guitar, was a member of the Cecilian Singers of Barbados, and a collector of musical instruments from around the world. He used to write songs for his children. At his funeral in 2004, nature lovers came together for a 'green celebration' - in song, dance and prose - of his life.

## Key.Words

**AGRONOMIST:** a scientist who studies the management of soil and crop production.

**ENVIRONMENTALIST:** someone who is concerned about and who takes part in measures to protect nature.

**ORGANIC FARMING:** a method of farming which uses nature-friendly techniques, with few or no chemicals such as fertilizers and pesticides.

## Steward of the Environment

# Julian Kenny

## Zoologist


*"Explore your curiosity. If you have questions, keep looking for answers." - Prof. Julian Kenny*

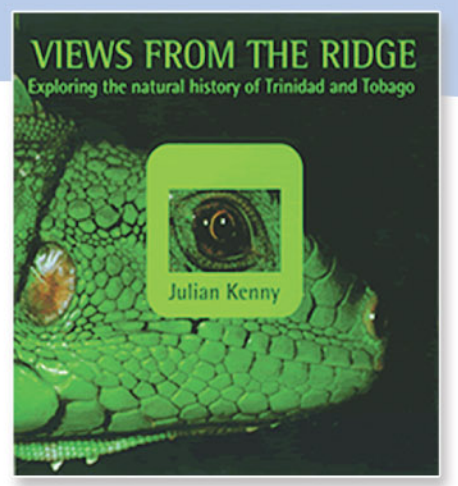
***PROFESSOR JULIAN KENNY*** is a zoologist and expert on the natural history of the Caribbean. He lectured at the University of the West Indies (UWI) for 29 years and led research on the ecology of the savannas, wetlands, cave systems, marine systems and coral reefs of Trinidad and Tobago. He has helped to protect sensitive ecosystems, manage fish stocks and create a National Trust in his homeland.

Julian Stanley Kenny was born in Woodbrook, Trinidad on January 27th 1930. He attended Belmont Intermediate School and St. Mary's College. He completed Grade 13 in Canada and pursued a Bachelor of Science degree at the University of Toronto. After graduating in 1951, he worked at a fisheries laboratory in Toronto and this experience stimulated his interest in fisheries research.

On his return to Trinidad, he worked as a Scientific Officer at the forerunner of the Fisheries Division. During his 9 years there, he helped to build the flying fish industry in Tobago and developed systems to evaluate fish catch and to identify registered fishing vessels. He later obtained his doctorate from Birkbeck College, London (1963).

At the Zoology Department, UWI St. Augustine, Kenny lectured in all aspects of zoology, but was best known for his interest in ecology and specifically zoogeography. He researched the distribution of freshwater fish species in Trinidad and Tobago and added vital information on anuran species.

*Golden tree frog*




*One of Kenny's publications*

He supervised postgraduate research on many local ecosystems, notably the Tamana Caves, the Caroni Swamp and the Aripo Savannas.

Due to his vast expertise, he was called to serve on many national committees. He was an Advisor to the Inter-Ministerial Committee on the Law of the Sea Convention; Chairman of the Board of the Institute of Marine Affairs; member of the Cabinet appointed Committee with responsibility for drafting National Park legislation; and an Independent Senator in the Senate of Trinidad and Tobago.

An underwater diver and nature photographer, Kenny has extensively photographed native wildlife, coral reefs and natural landscapes. He authored several books that feature these photographs including 'Views from the Ridge' and 'The Native Orchids of the Eastern Caribbean'.

He has donated his vast collection of photographs and scientific publications to the National Library Information System (NALIS) of Trinidad and Tobago. He serves as the current Chairman, Board of Trustees of the Guardian Life Wildlife Trust, which supports environmental education and protection.

## Key.Words

**ANURANS:** tailless amphibians – frogs and toads.

**NATURAL HISTORY:** the study and description of organisms and natural objects, especially their origins, evolution and inter-relationships.

**ZOOGEOGRAPHY:** the biological study of the geographic distribution of animals, especially the causes and effects of such distribution.

## The Self-Taught Professor

# George Moon Sammy


## Food Scientist

***"He enjoyed his work, believing the virtue of what was honestly produced by hand and mind."***
***- Prof. Kenneth Ramchand, UWI, St. Augustine.***

With no more than primary schooling, ***GEORGE MOON SAMMY*** set out to gain a university education. He succeeded and became the first Ph.D. graduate of the University of the West Indies (UWI), St Augustine. He established the Food Technology Department and became its first Professor.

George Moon Sammy was born on November 17th 1922 in Duncan Village, Trinidad. He came from a poor family and sold produce in the market while attending the Canaan Canadian Mission School (now Canaan Presbyterian School). He left school at age thirteen because he had to work.

He was an apprentice tailor and later an office boy and lab hand at Texaco Oil Company. He wanted to attend university, so he studied French, chemistry and mathematics at home. His determination paid off in 1953, when he passed his examinations and enrolled at the Sir John Cass College, University of London.

At university he spent his summer vacations working to earn tuition fees and was a member of the World Scout Association. He achieved a Special Honours Degree in Chemistry in 1957. Back home, he worked as a Research Chemist at the Texaco Refinery Laboratory.

*George Moon Sammy as a scout*

*Preserved local produce*

In 1964 he lectured at UWI while doing his master's degree. Two years later, he completed a doctorate in physical organic chemistry and then pursued a Master of Science degree in Food Science and Technology at the University of Massachusetts, USA.

Professor Sammy returned to set up a Food Technology Unit and laboratory with undergraduate and postgraduate programmes. He led research to develop new local food products. His successes included composite flour made from sweet potato and wheat, a sorrel drink that was later commercialised, a canned local fruit cocktail, and 'instant (dehydrated) yam.'

His work was highly respected throughout the Caribbean as it supported efforts to stimulate agricultural production. He established the Caribbean Institute of Food Science and Technology and assisted the National Foodcrop Farmers Association. He also educated farmers on preservation techniques to start small businesses.

An avid nature lover, he formed the Trinidad and Tobago Tropical Fish Association and owned an extensive collection of butterflies. He was a successful orchid breeder with three registered unique breeds.

The Trinidad and Tobago Government awarded him the Hummingbird Medal Gold (1974) and the Chaconia Medal Gold (posthumously, 1988). Sammy made significant contributions to developing the Region's capability in food technology but the full potential of his research has not been realised. He died on July 11th 1988.

## Key.Words

**FOOD TECHNOLOGY:** the application of scientific and engineering principles in research, development, production, quality control, packaging, processing and utilization of foods.

# Arnoldo Ventura

## Virologist


*"Science allows a better understanding of life so happiness comes easier. " - Dr. Arnoldo Ventura*

***DR. ARNOLDO VENTURA*** is the Prime Minister of Jamaica's Adviser on Science and Technology. He is known internationally for promoting science and technology to alleviate poverty. A former Chairman of the United Nations Commission on Science and Technology for Development (UNCSTD) in Geneva, he now heads the Inter-American Committee on Science and Technology (COMCYT) of the Organization of American States (OAS).

His career began with the study of human viruses, especially those spread by insects and those used in children's vaccines. He researched the natural history of viruses in the Caribbean, like dengue and those causing encephalitis infections. He studied the role of birds and their external parasites in spreading viruses. He discovered six new species of bird mites and developed tissue culture methods for virus detection.

*Mosquito spreading Dengue Fever*

Arnoldo Khaleel Ventura was born on November 16th 1937 in Kingston, Jamaica. He attended Windward Road Government Primary School and Kingston College where he enjoyed the sciences. Despite regular bouts of respiratory illness and dyslexia, he secured a Jamaican Government Exhibition Scholarship in 1957.

He pursued his Bachelor and Master of Science degrees at the University College of the West Indies (UCWI), Mona. Through a US Public Health Fellowship, he gained his doctoral degree from Cornell University in 1967. In the

*Poor community*

early 1970s, he worked as a researcher and professor of virology at the University of the West Indies and University of Miami.

Working in depressed communities, Ventura was struck by the bleakness of poverty. This sparked a desire to use science as a tool to solve social and economic problems. In 1977 he became Executive Chairman of the Scientific Research Council of Jamaica and obtained an avenue to put his ideas into action. Using television, newspapers and booklets, he encouraged the media and citizens to develop a greater awareness of science and technology.

Dr. Ventura gained many national accolades for his work in research and science and technology promotion including the Silver Musgrave Medal (2002), Commander of the Order of Distinction (2001) and the Institute of Jamaica Centenary Medal (1980).

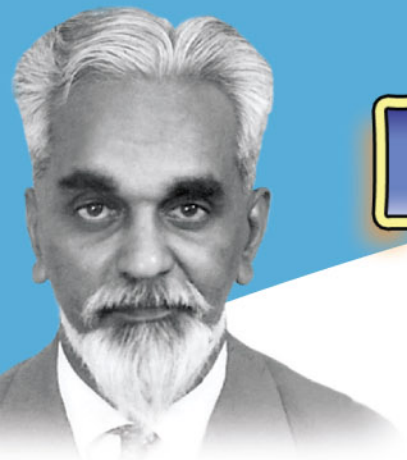
He notes that the excitement and satisfaction of a scientist's life cannot be experienced in any other profession. He considers that science enables an understanding of life as, "a learning, respectful and joyful relationship with the environment. Once we understand this, we can make the world a better place."

## Key.Words

**ENCEPHALITIS:** inflammation of the brain usually caused by a virus.

**SPECIES:** a category of classification, consisting of related organisms capable of producing viable offspring.

**DYSLEXIA:** a learning disorder marked by impairment of the ability to recognise and understand written words.



# Harry Annamunthodo


## Medical Researcher

*"As a West Indian, I have always regarded my service as a privilege." - Sir Harry Annamunthodo*

***SIR HARRY ANNAMUNTHODO*** was the first West Indian to be appointed to a Chair in the Faculty of Medicine, University College of the West Indies (UCWI) at Mona. He was an outstanding teacher who taught 1500-odd medical graduates over a 25-year period at UWI. He helped to build the Mona Medical Faculty and other medical schools in the Caribbean. As a surgeon his swiftness and skill were legendary.

Harry Annamunthodo was born in Essequibo, Guyana on April 26th 1920. As a young boy, he dissected the bodies of dead animals to look for the cause of death. He attended Queen's College in Georgetown on scholarship and won the British Guiana Scholarship in 1939. He began studies in medicine at the University of London two years later because of World War II. He won several prizes and graduated in 1946. He later obtained the Diploma in Tropical Medicine and Hygiene and the Fellowship of the Royal College of Surgeons, England.

Annamunthodo worked at King George V Hospital in Ilford, Essex for two years and was mentored by the renowned abdominal surgeon, Mr. Herman Taylor. In 1953 he entered the UCWI Hospital as Senior Surgical Registrar. He rose through the ranks to Head of Department and within six years, became the first West Indian Professor of Surgery. This was the most rapid promotion in the Faculty's history.

*Doctors performing surgery*

*Medical students*

He was named Hunterian Professor, Royal College of Surgeons, England and elected to Fellowship in the American College of Surgeons. In 1967, Her Majesty Queen Elizabeth II knighted him for service to medicine and medical education in the Caribbean region.

His skills as a teacher were widely admired. Sir George Alleyne - UWI Chancellor and his former student - said: "His dexterity, calmness and self-confidence became legendary;" and added that Sir Harry was, "approachable and interested,... kind and concerned for patients."

Sir Harry supervised construction of the Mona Medical Faculty building and contributed to it becoming "the ultimate referral for the Caribbean area." He helped to set up the Eastern Caribbean Medical Scheme in Trinidad and to co-ordinate the teaching of surgery in Barbados and the Surgical Residency Programme at Mona.

He was conferred with the status of Professor Emeritus by the UWI and a final year prize for Surgery was named in his honour. He was appointed Professor of Surgery at the University of Kebangsaan, Malaysia and developed its postgraduate programme. He held this post until his death in 1986.

## Key·Words

**ANATOMY:** the science of the structure of bodies of humans, animals and plants.

**HYGIENE:** the science of maintaining good health in clean conditions.

**PATHOLOGY:** the branch of medicine that deals with laboratory examination of samples of body tissue.

# Julian Duncan

## Botanist


*"I am not here forever and whatever knowledge I have, I want to impart it to others." - Prof. Julian Duncan*

***JULIAN DUNCAN***, Professor Emeritus (Botany) at the UWI St. Augustine, played a vital role in the training of young scientists through teaching and research in botany and plant tissue culture. His pioneering efforts in tissue culture yielded successful methods for mass producing high quality planting materials for several important plant species.

An outstanding educator, he received the inaugural UWI Vice Chancellor's Award for Excellence in Teaching and Administration. The National Institute of Higher Education, Research, Science and Technology (NIHERST) presented him with a Lifetime Achievement Award (2000) for lifelong commitment to agricultural research and development.

Julian Duncan was born in St. Vincent on December 9th 1933. In an era without television, he read, used his imagination and enjoyed the outdoors. He attended St. Vincent Boys' Grammar School where he played badminton competitively.

In 1957, he entered the University College of the West Indies, Jamaica to read for a bachelor of science degree. He was the first recipient of the Sir James Irvine Memorial Scholarship and pursued a doctoral degree at St. Andrews University, Scotland. His research developed a brilliant new premise for nuclear division of fungus for which no precise theory yet existed.

*Plant Tissue Culture*

*Duncan receiving Vice Chancellor's Award*

Duncan became a botany lecturer at UWI in 1963. He trained generations of undergraduate and postgraduate students over a 35-year period and held senior administrative positions. He was a highly effective educator with his lucid lectures and scientific demonstrations. He encouraged students to think, read and be all-rounded.

He studied plant tissue culture techniques at Freie University in Berlin, Germany and later updated this expertise in Brazil. He introduced the specialisation via a plant propagation course and set up the UWI Biotechnology Research Unit, which trained many young scientists in this field. He also established the region's first semi-commercial tissue culture laboratory.

Retired since 1999, he was a former board member of the Caribbean Industrial Research Institute, Institute of Marine Affairs and Asa Wright Nature Centre. He remains active in academia and research and represents Trinidad & Tobago on the Board of Governors of the International Centre for Genetic Engineering and Biotechnology.

Duncan authored a book on local flowers and published several articles in recognised scientific journals. In his leisure time, he does woodwork and assists his church. His personal philosophy is: "With God all things are possible". He suggests that the word "can't" should be replaced by "I have not tried" and advises young people to strive to be themselves.

## Key Words

**TISSUE CULTURE:** The practice of cultivating, developing or producing growth from cells of plants or animals or any parts or organs.

**BIOTECHNOLOGY:** Any technology which utilises a living organism to improve or make a new product, such as yeast activity in the making of beer or bread.

# The Lion of St. Mary's

# Leonard Graf


## Teacher

***"His unspoken motto was 'service' and his driving force was charity. "***
***- Fr. Anthony deVerteuil, Former Principal, St. Mary's College***

***FR. LEONARD GRAF*** taught at St. Mary's College in Trinidad for 60 years! He initially taught Latin, Greek and Ancient History but switched to the sciences to meet new needs of the College. During his 42 years of science teaching, St. Mary's won the science scholarship 31 times.

Leonard Joseph Graf was born in Aachen, Germany in 1883. He wanted to become a priest but Germany's 'Iron Duke', Otto von Bismark closed the Roman Catholic seminaries. At age ten he began studies for the priesthood at Rockwell College's Junior Seminary in Tipperary, Ireland. He learnt to speak English and placed first in Ireland's School Leaving Certificate Examinations.

He taught at Rockwell and pursued an external Bachelor of Arts degree at the Royal University of Ireland (National University). He attained his degree in 1903 and joined St. Mary's College in 1906. In 1910 he was ordained a priest.

When St. Mary's sought to change its emphasis on the arts to science, Fr. Graf gained qualifications in zoology and botany by self-study to enable this thrust. He developed a commanding knowledge of these subjects and enhanced his teaching by field trips. Even non-science students benefited from trips that he led to the natural savannas, offshore islands and El Tucuche (the second highest mountain in Trinidad).

*St. Mary's College students*

*Fr. Graf Wing, St. Mary's College*

Fr. Graf was a motivating force in the lives of his students. He was patient and often loaned personal library books to provide study references to students. Former students admit to 'The Lion's' influence in shaping their lives beyond the College's walls. He counselled them on career choices and kept in contact throughout their adult lives.

A later principal summed him up as "The pillar of St. Mary's" as he also spearheaded many extra-curricular activities including the choir, orchestra, film evenings and annual plays. He retired from teaching in 1966 having missed only two days of school in 60 years!

He was an active member and President of the Trinidad and Tobago Field Naturalists' Club and was elected an honorary member in 1955. He took amateur photographs and made short movies of the group's botanical excursions. He made eleven trips to the top of El Tucuche, his last at age 72.

In 1969, the Government of Trinidad and Tobago awarded him one of the inaugural National Awards, the Chaconia Medal Gold, for long and meritorious service in education. After a period of declining health, Fr. Graf passed away on January 15th 1970.

## Key·Words

**ZOOLOGY:** the scientific study of the behaviour, structure, physiology and classification of animals.

**BOTANY:** the scientific study of the structure, classification, ecology and economic importance of plants.

# Norge Jerome

## Nutritional Anthropologist


*"Believe in each other and embrace change by blending old and new traditions." - Dr. Norge Jerome*

***DR. NORGE JEROME*** is Professor Emeritus of Preventive Medicine (Nutritional Anthropology), University of Kansas School of Medicine. She developed Nutritional Anthropology as a new discipline and spent over 40 years as a professional nutritionist, educator and consultant in this field.

Norge Winifred Jerome was born on November 3rd 1930 in Mon Plaiser, Grenada. She passed the Senior Cambridge Examinations at age 16 from St. Joseph's Convent. She attended Howard University, Washington D.C. on scholarship to become a dietician. She obtained master's and doctoral degrees from the University of Wisconsin. While pursuing her doctorate, she launched Nutritional Anthropology, studies relating to food habits, nutrition and cultural impacts. She became a professor at the University of Kansas in 1967. She researched food intake and human performance in Egypt and food consumption patterns of black communities in America and Grenada. In 1980, she published the book "Nutritional Anthropology: Contemporary approaches to diet and culture." Jerome advanced women-in-development issues and promoted solar cookers in Africa.

She served as Director of the Office of Nutrition, US Agency for International Development. Retired since 1996, she established the Dr. Norge W. Jerome Grenada Teachers' Awards. She was honoured by the Institute of Caribbean Studies and the Department of Preventative Medicine and Public Health, University of Kansas. She advises young people to sustain their creativity and encourages Caribbean people to, "believe in each other and embrace change."

### Key.Words

**ANTHROPOLOGY:** the study of human beings from early times to the present day.

**NUTRITIONAL ANTHROPOLOGY:** the study that links nutrition with the biology and cultures of people. It determines how culture impacts on their food, health and nutrition.

## Doctor from the Past

# Samuel Jones

## General Practitioner


*"A well-read and highly informed individual, Jones was willing to share his knowledge with others."*
*- Victoria Borg O'Flaherty, National Archivist*

***DR. SAMUEL BENJAMIN JONES*** was a medical doctor and magistrate, who improved Anguilla's health care system in the early 1920s. His most significant contribution was the eradication of small pox in that island for which he received the Order of the British Empire (OBE) in 1933. He also performed extensive research on the cause and treatment of syphilis (a venereal disease) and Bilharziasis (now called Schistosomiasis) in St. Kitts.

Samuel Benjamin Jones was born in 1874 in Antigua. At age nine he attended Antigua Grammar School on scholarship and later Codrington College. He taught in the United States of America then studied medicine. He held Licentiates of the Royal College of Physicians, University of Glasgow and the Royal College of Surgeons, University of Edinburgh, Scotland. He returned to St Kitts in 1918 as an Acting Medical Officer and became interested in intestinal worm infections.

He was transferred to Anguilla for five years and was instrumental in eradicating mild small pox and Bilharziasis. He stayed on until retirement in 1939 working to create a proper health care system. He emphasised cleanliness in delivery rooms to reduce child mortality rates, established a small hospital and trained a district nurse to teach basic sanitation. Dr. Jones also gave free medical treatment to many persons. He advocated the Grow More Food Campaign introduced in St. Kitts and Nevis during the war and his advice was sought on a wide range of matters. For his contributions he received an award from the people of Anguilla, St. Kitts and Nevis. He died on November 11th 1949.

### Key.Words

**BILHARZIA:** infestation or infection caused by the Schistosoma parasite.

**SMALL POX:** an infectious, often fatal disease caused by the pox virus



# Earle Kirby

## Veterinarian


*"His tremendous knowledge on a tremendous range of subjects impressed me."*
*- Dr. Dick Julian, Ontario Veterinary College (classmate 1952)*

***DR. EARLE KIRBY*** is St. Vincent's first qualified veterinarian. A 'man of many trades', he also contributed to the culture, archaeology and history of St. Vincent and the Grenadines as a self-taught master.

Ian A. Earle Kirby was born on December 16th 1921 in Queensberry and attended the Methodist Public School and Intermediate Grammar School. He attained his first degree at the Imperial College of Tropical Agriculture, Trinidad. He studied veterinary medicine at Ontario Agriculture College (University of Guelph), Canada on scholarship and at Edinburgh University, Scotland. Kirby undertook his veterinary practice in St. Vincent. As the Chief Veterinary Officer in the Ministry of Agriculture, he examined livestock (sheep and goats) for export. He studied the potential of the honey industry and during World War II, the pilot whale fishery as a possible source of scarce Vitamin A-rich cod liver oil.

His love for the outdoors sparked diverse interests. At the Seismic Research Unit, he collected temperature and water depth data in La Soufriére's volcano crater - afloat in a tyre. He studied archaeology and worked in a museum of artefacts from naval wrecks and petroglyphs. He was Chairman of the St. Vincent Archaeology Society, Director of the National Museum, and authored books on St. Vincent's Black Carib civilisations. He retired in 1979. For his contributions to his homeland, he received the Order of British Empire and was featured on a postage stamp for the International Year of Elders (1999). Dr. Kirby also received the Duke of Edinburgh Award for service to youths.

### Key.Words

**PETROGLYPH:** a carving or line drawing on rock, especially made by prehistoric people.

**ARCHAEOLOGY:** the study of past human life and culture by the recovery and examination of remaining evidence such as graves, tools and pottery.

## Investigator of Cancers

# Bert Achong

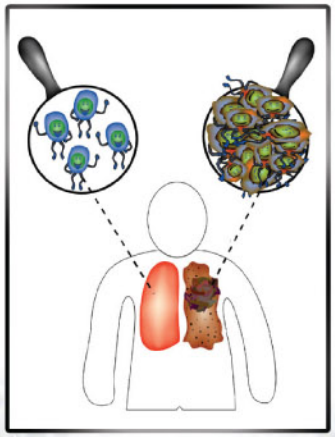
## Clinical Pathologist


*"A great Trinidadian scientist." - Prof. Courtenay Bartholomew, UWI.*

***DR. BERT ACHONG*** contributed to the discovery of the Epstein-Barr Virus (EBV), a herpes family virus, in 1964. This virus is associated with two human cancers and is considered "the favoured explanation" of chronic fatigue syndrome. His findings provided insights into treatments of these illnesses. Examining human cancer cells in 1971 by electron microscopy, he discovered a 'Foamy Virus'. It was the first example of a retrovirus infection in man.

Bert Geoffrey Achong was born in Port of Spain, Trinidad on December 6th 1928. He attended St. Mary's College and won the science scholarship and Jerningham Medal Gold in the Higher School Certificate Examinations in 1946. He studied medicine at University College Dublin, Ireland. He later trained as a clinical pathologist at Lambeth Hospital, London.

He joined Sir Anthony Epstein, a researcher of viruses associated with cancer, at Bland Sutton Institute, Middlesex Hospital and made important discoveries using his training in electron microscopy. When examining Burkitt's lymphoma (an African childhood tumour), he pinpointed particles of the EBV. He authored several books, including "The Epstein-Barr Virus" co-edited with Sir Anthony. Dr. Achong lectured in the Department of Pathology, University of Bristol, England and inspired his students. He received doctorates in science and medicine from the National University of Ireland. He held Fellowships in the Royal College of Physicians, Ireland and the Royal College of Pathology, England. He died in 1996.



*CANCER: cells that grow out of control and clog up parts of the body.*

### Key·Words

**CLINICAL PATHOLOGIST:** a scientist who uses laboratory methods to diagnose diseases.

**ELECTRON MICROSCOPE:** a microscope that produces images using a beam of electrons to illuminate objects.

**RETROVIRUS:** a virus which merges with the cell that it infects.

## The Virus Detective

# Barbara Hull

## Virologist


*"We should seek to understand and learn more and more about the world around us." - Dr. Barbara Hull*

***DR. BARBARA HULL*** contributed to public health and disease control for 27 years. In Trinidad and Tobago she set up crucial disease surveillance systems. Regionally, she researched the spread of HTLV-1 and HIV and piloted standardised testing. She also led the Global Polio Eradication Programme of the World Health Organization (WHO).

Barbara Phyllis Naomi Hull was born in Belmont, Trinidad in 1939. She attended Providence Intermediate School, Bishop Anstey High School and Polytechnic Institute. She attained a B.Sc. (1966) and M.Sc. (1969) from McGill University, Canada. She researched the Trinidad Cocal virus for her master's thesis while working at the Trinidad Regional Virus Laboratory. To facilitate disease reduction, monitoring systems were developed using health institutions. In the 1970s, she effectively prepared her country for the 1972 polio outbreak and discovered two new strains of the yellow fever virus. She also discovered that a seasonal virus caused gastrointestinal disease in children during research for her Ph.D. at the University of the West Indies (1983).

At the Caribbean Epidemiology Centre, she co-ordinated regional surveys on polio and other diseases and was involved in the Pan American Health Organization's Polio eradication programme. Globally she improved the capability of the WHO network of polio laboratories and contributed to measles and yellow fever control. In 1986 she received the Trinidad and Tobago Medal of Merit. She advises: "There is no better way to spend your life than in the pursuit of science."

### Key-Words

**POLIO (POLIOMYELITIS):** a viral disease marked by inflammation of nerve cells of the brain stem and spinal cord.

**TRINIDAD COCAL VIRUS:** a virus discovered in Cocal, Trinidad spread by mites and mosquitoes which causes illness in pigs, cattle and horses.

# Joseph Pawan

## Bacteriologist


***"The most distinguished contribution made by a Trinidadian in the world of Tropical Medicine was made by Dr. Joseph Lennox Pawan." - Michael Anthony, Writer/Historian***

***DR. JOSEPH PAWAN*** was internationally acclaimed for the discovery of the rabies virus transmitted by vampire bats. He undertook numerous public health assignments and conducted research on tropical diseases in the 1940s.

Joseph Lennox Pawan was born in Trinidad on September 6th 1887. He attended St. Mary's College and won an Island Scholarship in 1907. He attained bachelor degrees in medicine and surgery at Edinburgh University, Scotland in 1912. He became an Assistant Surgeon at the Colonial Hospital, Port of Spain during World War I and was appointed a Bacteriologist.

Rabies killed several cows in 1925 and 13 people died in 1929. Though rabies was known to be spread by dogs, none of the victims were bitten by dogs. Pawan, J.A. Waterman and H.M.V. Metivier worked to isolate the disease. During research, a patient mentioned being bitten by a bat before becoming ill. Another researcher (Carini, 1913) had uncovered that vampire bats carried the disease and Pawan, knowing that bat bites were common in country districts, followed this lead. In 1932 he isolated the rabies virus from various bats including *Desmodus rotundus*. A vaccine was developed that saved many lives globally. Pawan was honoured as a Member of the British Empire in 1934. He became a consultant to the United States Government on rabies. He was invited to chair the World Health Organisation but declined on account of ill health. He died in 1957 and the Pan American Health Organization named him a 'Hero in Health' in 2000.

## Key•Words

**VIRUS:** a minute organism which multiples only inside living host cells and which causes infection and disease.

**BACTERIOLOGIST:** a scientist who studies bacteria (single-celled organisms), which may cause infection and disease.

## Master in Vascular Surgery

# Allastair Karmody


## Vascular Surgeon

*"The most brilliant person I ever knew" - Dr. Collingwood Karmody, Surgeon*

***DR. ALLASTAIR KARMODY*** is internationally recognised for his techniques in vascular surgery. Among these is the 'Albany operation' for treating blocked arteries in the lower limbs. The procedure bypasses the blood flow of blocked lower limb arteries into the saphenous vein. He also pioneered limb re-attachment surgery and kidney transplants at Albany.

Allastair Michael Karmody was born in Trinidad on March 29th 1937. He attended Coffee Street E.C. Primary School and St. Mary's College. He won the Jerningham Gold Medal and the science Island Scholarship in 1955. He studied medicine at the University of Aberdeen, Scotland and Oxford University, England. His master's degree in surgery researched blood's clotting mechanism. He held Fellowships of the Royal College of Surgeons in England and Scotland. In 1970 he joined the Albany Veterans Administration Hospital, New York and later the faculty of Albany Medical College.

Together with other surgeons, he developed a reputation for excellence in vascular surgery at the Albany Medical Institute for Vascular Health and Disease. He and Dr. Robert Leather refined the 'in-situ saphenous vein bypass' and set a new international standard. He was elected Professor of Surgery in 1980 and mentored postgraduate surgeons from around the world. He authored over 150 publications and held memberships in the American Surgical Association and the Society of Vascular Surgery. He died in 1986. The Society for Clinical Vascular Surgery administers the '*Allastair Karmody Essay*' award for medical students and the Karmody Vascular Laboratory, Albany is named in his honour.

### Key·Words

**VASCULAR SURGERY:** a branch of medicine dealing with the use of surgery to correct or treat diseases of the blood vessels (vascular system).

**SAPHENOUS VEIN:** the vein that drains the foot and the leg.

# Rodney Maingot


## General Surgeon

*"His death was not only a great loss to his family and his friends but also to the surgical fraternity all over the world." - Dr. L.A. Halsey McShine, Trinidadian Surgeon*

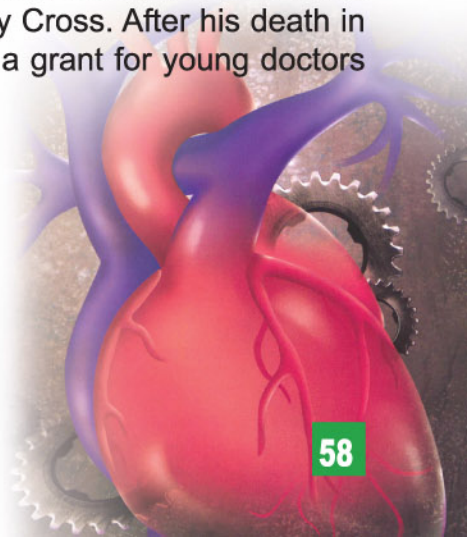
***MR. RODNEY MAINGOT*** was a world-renowned surgeon, writer on surgery and teacher of postgraduate surgeons. His best-known publication is 'Abdominal Operations' (1940) which today remains a key text for aspiring surgeons in Great Britain. He was Editor-in-Chief of the British Journal of Clinical Practice and a regional consultant in the Emergency Medical Service during World War II.

Rodney Maingot was born on February 27th 1893 in Trinidad. At age 8 he migrated to England. He studied at Upshaw College, Durham and at St. Bartholomew's Hospital in London. He qualified in 1916 with Membership of the Royal College of Surgeons, England and the Royal College of Physicians, London. He obtained the Fellowship of the Royal College of Surgeons (FRCS), England in 1920. He also served in World War I.

His popularity as a surgeon (particularly gall bladder surgery) was witnessed at Royal Waterloo and Southend hospitals in London. There he was the consulting surgeon and young surgeons came to see him operate, making these key centres for postgraduate instruction. His reputation was widely known and he was Visiting Professor of Surgery at Ohio State Medical School, Mount Sinai Hospital in Miami and Maadi Hospital in Cairo. In 1976, he received his homeland's highest honour, the Trinity Cross. After his death in 1982, using the assets of his estate, his family established the Maingot Charitable Trust. The Trust provides a grant for young doctors from Trinidad and Tobago to qualify for the FRCS.

### Key·Words

**GALL BLADDER:** a small, pear-shaped muscular sac, located under the right lobe of the liver, which stores bile, the fluid used by the body for digestion.



## A Scientist in Africa

# Earl Long

## Parasitologist


*"Do something you like and also do something that will make you a living." - Dr. Earl Long*

***DR. EARL LONG*** works at the Division of Parasitic Diseases, National Center for Infectious Diseases (NCID), USA. He conducts training and research on parasitic and other infectious diseases. In 1990, he published the first descriptive characteristics of the intestinal parasite *Cyclospora cayetanensis* from Nepal, India. He is an Advisor to the World Health Organization and the US Agency for International Development.

Earl Long was born in Castries, St Lucia in 1945. He attended the Catholic Boys' School and St Mary's College. An avid reader, he was a good student of science and English. He gained a bachelor's degree from Western Ontario University, Canada. His master's and doctoral degrees were obtained from the School of Hygiene and Tropical Medicine, University of London. He also studied Schistosomiasis in Tanzania and later researched this infection in St. Lucia. In 1985 he became Head of the Parasitic Department, Center for Disease Control, a position he held for 19 years. During his tenure he researched malaria, tuberculosis, AIDS and gastroenterology in the Congo.

Long belongs to many professional organisations including the Royal College of Tropical Medicine and Hygiene, London. He established collaborative research activities among the UWI School of Medicine, Morehouse School of Medicine and the Center for Disease Control. Dr. Long advises kids, "if you want to get into the sciences it is best to combine your studies with non-science subjects to get a real education".

### Key•Words

**PARASITOLOGIST:** one who studies parasites (i.e. organisms that live off other organisms).

**SCHISTOSOMIASIS (or BILHARZIA):** a chronic disease caused by parasitic worms in the bloodstream.

# Garth Taylor


## Opthalmologist and Eye Surgeon

*"I believe the body is just an extension of the eye. My hobby is practising opthalmology, my relaxation is practising opthalmology. I want to do opthalmology till I stop breathing." - Dr. Garth Taylor*

***DR. GARTH TAYLOR*** is perhaps the most internationally travelled eye surgeon as co-founder and Director of Canadian Surgical Eye Expeditions (CAN.SEE) and Vice-President of ORBIS Canada. He is Chief of Opthalmology at Cornwall General Hospital and Associate Professor of Opthalmology at Queen's University, Ontario, Canada.

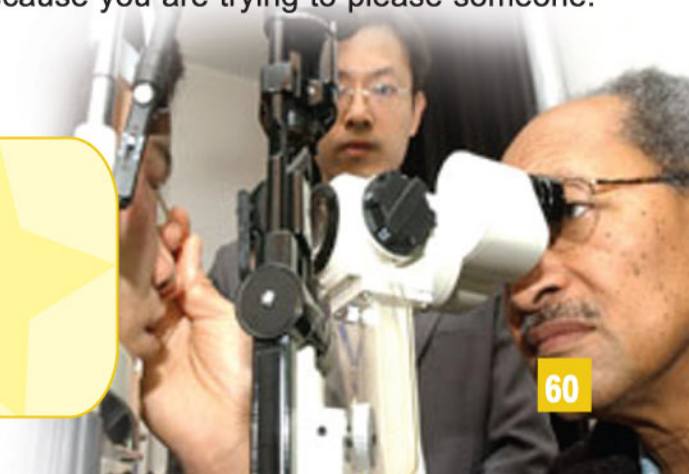
Garth Taylor was born in Montego Bay, Jamaica on April 29th 1944. He attended St. James Boys' Primary School and Cornwall College. He always wanted to become a doctor and was an all-round student. As a boy scout, he lowered the Union Jack on Jamaica's Independence Day (1962). He qualified in medicine from the University of the West Indies (UWI), Jamaica in 1970 and practised there until 1971. He specialised in ophthalmology at Civic Hospital, Ottawa and Queen's University. He pursued studies at Bascom Palmer Eye Institute, Miami, USA in corneal surgery and external diseases. He has worked at Cornwall General Hospital for 24 years.

Taylor conducted one hundred plus missions on ORBIS International's DC-10 flying eye hospital since 1982. As Medical Director, he operates and trains surgeons to decrease cases of treatable blindness worldwide. He conducted 3,000 eye operations internationally with CAN.SEE. He holds the Order of Distinction (Commander) of Jamaica and the Canadian Government's Meritorious Service Medal. He advises children to mould their lives after mentors and cautions: "Don't do something because you are trying to please someone. Do something you like - [but] do not hurt anyone in the process."

### Key•Words

**OPHTHALMOLOGY:** the branch of medicine concerned with the eye and its diseases.

**CORNEAL SURGERY:** surgery performed on the clear covering of the eyeball (the cornea) to correct vision problems.



# These CARIBBEAN ICONS in SCIENCE, TECHNOLOGY & INNOVATION will also be featured on our website

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***Chelston Brathwaite** (Barbados)*

***Plant Pathologist***
Developed effective protection measures for Caribbean crops.

***Susan King** (St. Lucia)*

***Paediatrician***
Conducted critical research into paediatric HIV / AIDS infection.

***Ivan Chang-Yen** (Guyana)*

***Analytical Chemist***
Pioneered analytical chemistry programmes at UWI, St. Augustine.

***Francis Cope** (Trinidad)*

***Cocoa Breeder***
Developed breeding programmes for *Theobroma cacao* in the region.

***Leonard O'Garro** (St. Vincent)*

***Plant Pathologist***
Researched diseases of commercial West Indian crops.

***Kenneth Magnus** (Jamaica)*

***Research Chemist***
Developed chemistry programmes at UWI, Mona.

***Lawson Douglas** (Jamaica)*

***Urologist***
Pioneered kidney transplants and treatment of chronic renal failure in the Caribbean.

***Gerald Lalor** (Jamaica)*

***Chemist***
Director General, International Centre for Environmental and Nuclear Sciences (ICENS).

***William Edwin Freeman** (Trinidad)*

***Agronomist***
Developed the Trinidad Select Hybrid (TSH), one of the world's successful cocoa varieties.

***Theodosius Poon-King** (Trinidad)*

***Medical Researcher***
Hailed by the Trinidad and Tobago Medical Association as the "Medical Researcher of the Century".

***Kenneth Julien** (Trinidad)*

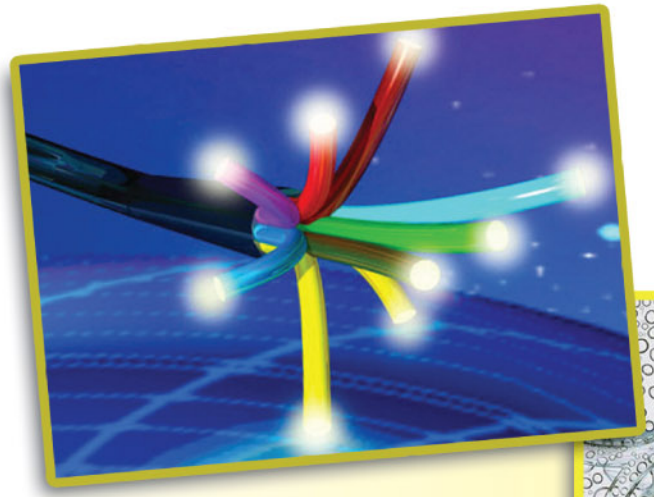
***Electrical Engineer***
UWI Professor Emeritus who pioneered engineering education for over 35 years.

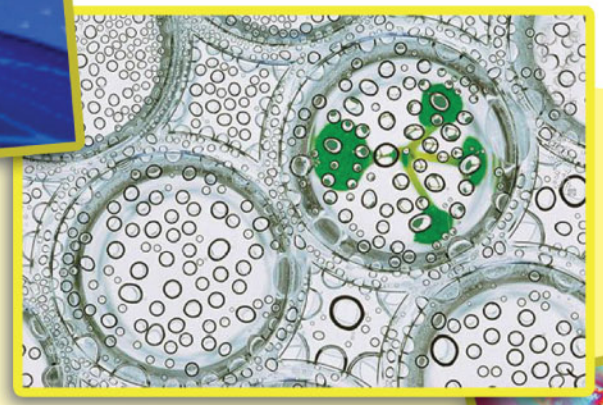
***Errol Walrond** (Barbados)*

***Surgeon***
Initiated the Doctor of Medicine and other postgraduate programmes at UWI, Cave Hill.

*" CCST is pleased to provide this resource book on the accomplishments of Caribbean scientists. The men and women who are featured in this book are fine examples of the ways in which excellence can be achieved through dedicated effort and an inquiring mind. We hope that through this and future works youngsters may gain new insights into the interesting world of science and be inspired to do their very best."*

FELIX GREGOIRE *CCST Chairman*





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