

CITATION FOR GORDON CRAGG

Honorary graduand, Rhodes University, 10 April 2010

By Professor Paul Maylam

There has been recently discovered in a forest in Madagascar a new species of plant. It has been called *Ludia craggiana*, named after Dr Gordon Cragg. How many South Africans, one wonders, have had plants named after them?

This is one of many honours to have been bestowed on Gordon Cragg for his outstanding work in the field of pharmacognosy – I'm sure you all know what that is, but in case you don't it is the scientific study and application of drugs that are derived from natural sources. Dr Cragg operates in the belief that the natural world can provide many answers to scientists' search for medical treatments and cures. In his numerous publications he has documented the role of natural products in drug discovery.

His own major interest lies in the discovery of new natural agents for the treatment of cancer and AIDS. In this field the greatest achievement has been the development of Taxol, one of the most effective anti-cancer drugs available – a drug derived from the bark of the Pacific yew tree. Although not directly involved in the original discovery, Gordon Cragg played a major role from 1984 to 1992 in securing adequate access to this yew tree – involving extensive, delicate negotiations with governments and private individuals. The current market value of this compound and derivatives now in clinical use is over eleven billion dollars.

Then, too, there are vincas, small ornamental plants which have produced two more anti-cancer drugs. Research into natural products that might give rise to treatment for HIV/AIDS is ongoing. Some hope rests on the extract from a Malaysian tree – likely to lead to clinical trials in Malaysia.

For fifteen years, from 1989, Gordon Cragg headed the Natural Products Branch Developmental Therapeutics Program at the US National Cancer Institute in Maryland – and has continued to work there as a volunteer for the past five years since his retirement. This is a massive programme involving the collection and preservation of natural products – not just plants and tree materials, but also marine organisms, such as sponges and sea slugs. The Institute currently holds a research repository of more than 70 000 plant specimens, over 10 000 marine organisms, and about 30 000 extracts of bacteria and fungi.

This whole endeavour is, of course, an ethical minefield. Gordon Cragg is esteemed and renowned as much for his ethical approach to this research as he is for his scientific work. There is, first, the threat to endangered species – on this score Dr Cragg is wholly committed to biodiversity conservation and sustainability. Second, there is the danger of pharmaceutical companies exploiting the countries that are the source of the natural products. Here he has been totally scrupulous – ensuring that agreements are signed with the source countries – agreements that secure the consent of the host country, that guarantee a sharing of benefits, with a percentage of the royalties returned to the country concerned. Developing countries are assisted in advancing their own drug discovery programmes. Researchers from these countries are invited to spend time at US universities and institutes. There is respect for the intellectual property rights of indigenous peoples – the subject of a book to which Gordon has contributed.

He travels frequently to developing countries to talk about the programme – between 1988 and 2008 being invited to give over 70 lectures outside the US – it is striking that of these almost two-thirds were given in developing countries across the world: in Africa – Tanzania, Uganda, Benin, Botswana, Zimbabwe, South Africa, among others. From Jamaica, Costa Rica and Panama in the west, to Malaysia and Indonesia in the

far east. These kinds of intervention seem to have taken precedence over the high-profile international academic conferences.

This outstanding career began here in the eastern Cape – at Kingswood College, and then at Rhodes University where Gordon graduated with a BSc honours in chemistry – and where he excelled as a fine athlete. There followed an Oxford doctorate, and post-doctoral research at the University of California, Los Angeles. Then teaching spells from 1966 to 1979, first at UNISA, then at the University of Cape Town, where he became professor of organic chemistry. Since 1979 he has worked at cancer research institutes in Arizona and Maryland.

Gordon Cragg's output of publications is formidable; eight books authored or co-edited; over thirty chapters in books, and more than a hundred journal articles. For these articles there have been over 3000 citations – hence his inclusion on a website listing the world's most cited authors.

For his immense contribution to biodiversity conservation he received in 2006 the prestigious William L. Brown Conservation Award from the Missouri Botanical Garden. Not forgetting, too, his presidency of the American Society of Pharmacognosy in the late 1990s.

Add to this his involvement in social upliftment programmes across the world through his Methodist church in Maryland – providing meals for the homeless, giving assistance to homes for abused women and children, supporting educational, charitable and mission projects in Sri Lanka, Tanzania, Kenya, the DRC and South Africa. He is known as the ultimate gentleman, committed and kind, modest and dedicated.

One wonders how many lives have been saved or extended as a result of Gordon Cragg's work. It is no wonder, then, that he

has been described as the National Cancer Institute's own "medicine man", and as "a pioneering and brilliant advocate for exploring 'nature's pharmacy' for the benefit of humankind".

Almost exactly 53 years ago, early in April 1957, he was awarded a BSc honours degree at a Rhodes graduation ceremony. Today, Mr Chancellor, I have the honour to request you to confer on Gordon Mitchell Cragg the degree of Doctor of Science, *honoris causa*.