

Preface

“This Trilogy of books answers the question “What is Horticulture?”. Their contents span from tropical plantations growing exotics crops such as cocoa, pineapples and rubber through to the interior landscaping of high-rise office tower blocks and to other landscape applications which encourage physical and mental health. The common thread uniting this Discipline is the identification, breeding, manipulation of growth and stimulation of flowering and fruiting in plants either for food or environmental improvement. Understanding the scientific principles of why plant productivity increases following physical, chemical and biological stimuli has fascinated horticulturists for several millennia.

Epicurus (341BC–270BC) the Athenian philosopher of the 3rd century BC believed that plants achieved “the highest good was calmness of mind”. Calmness comes to some Horticulturists with the satisfaction of entering vast hectares of bountiful orchards, to others from well designed and carefully maintained landscapes, while others are entranced by participation in conserving components of the Earth’s fragile biodiversity. Horticulture while being a scientific discipline has much wider and deeper dimensions. There are historic, artistic and cultural facets which are shared with the Humanities and these aspects are included within this Trilogy. Wherever Horticulturists gather together they share a common language which interprets useful scientific knowledge and cultural understanding for the common benefit of mankind. For while Horticulture is about achieving an intensity of growth and development, flowering and fruiting, it is wholly conscious that this must be achieved sustainably such that the resources used are matched by those passed on for use by future generations.

The structure of this Trilogy is such that it traces the evolution in emphasis which has developed in Horticultural philosophy across the second half of the 20th and into the 21st century. Following the worldwide conflicts of the 1940s the key desires were the achievement of food sufficiency and the eradication of hunger. In the increasingly affluent developed world there is food sufficiency par excellence obtained from the planet. Never before has such an array of plenty been made available year round. This plenty is nowhere more evident than in the fresh fruit and vegetable aisles of our supermarkets. Horticulture has given retail shoppers the gift

of high quality and diversity of produce by manipulating plant growth, reproduction and postharvest care across the globe.

This second volume illustrates in considerable depth the scientific, managerial and technological concepts which underpin Environmental Horticulture. It covers considerations of: Horticulture and the Environment, Woody Ornamentals, Herbs and Pharmaceuticals, Urban Greening, Rural Trees, Urban Trees, Turfgrass Science, Interior and External Landscaping, Biodiversity, Climate Change and Organic Production. These subjects are united by consideration of the need for the sustainable use of resources and careful conservation applied to all points where Horticulture, natural flora and fauna, and the environment coincide. Horticulture plays an enormous role in aiding environmental care and support. Indeed this discipline could be considered as having founded much of the basis for what is now considered to be ecological, environmental science and the analysis and understanding of eco-system services. This is illustrated by the current enthusiasm for developing green “eco-towns” and “garden cities”. Such concepts are rooted in Horticulture as illustrated for example by Dame Sylvia Crowe’s town and country planning in the period 1930–1950. Recent revivals reflect the need for rejuvenating cities and communities which have exhibited declining economies, poor employment opportunities, and returning poverty. Initiatives have provided employment opportunities that link living networks of green plants, in residential, peri-urban and rural areas, with business, leisure and tourism development, and also address environmental issues associated with ensuring air and water quality, habitat conservation and sustainable recreation development.

Research shows that green open space provides plant communities that offer shade and release oxygen, act as fuel sources and sinks for the sequestration of atmospheric carbon dioxide, control soil erosion, stabilize dust particles, reduce glare, noise and visual pollution, conserve surface water resources, and act as wildlife or biodiversity corridors, that protect and conserve diverse populations of flora and fauna. The presence of healthy plant communities provides significant economic benefits in the form of increased tourism, employment opportunities, and commercial real estate values. Considerable cost-benefits are added, such as carbon sequestration, providing carbon credits and stormwater attenuation. There is also evidence that green open space provides energy savings in terms of reducing air conditioning and cooling costs, pollution and lowering health care expenses.

Particular attention is given to the threats posed by climate change. This is the single largest challenge which faces scientists of all disciplines. Horticulture has much to offer by way of mitigation. Such measures will then permit nations to deal with the consequences of an increasing world population and increasing urbanisation. Unless mankind is able to limit the rate of population expansion there will be continuing damaging effects on natural green spaces. This will further degrade the World’s natural resources, such as wetlands, grasslands, wild areas, coastal systems and temperate and tropical forests. Losing the biological functions, and the ecosystem services of these natural green spaces, places mankind in even greater jeopardy. Horticulturists along with other ecologists are beginning to develop understandings of the means by which mitigation of this damage may be achieved.

The first volume in this Trilogy covers Crop Production Horticulture (volume 1) and the final volume is devoted to Social Horticulture (volume 3). Volume 1 illustrates in considerable depth the science and technology which underpin the continuous production of Horticultural Produce. Firstly there is a consideration of the aspects of industrial development based on basic scientific discoveries. This is followed by chapters written by acknowledged world experts covering the production of: Field Vegetables, Temperate Fruit, Tropical Fruit, Citrus, Plantation Crops, Berry Crops, Viticulture, Protected Crops, Flower Crops, Developing New Crops, Post-harvest Handling, Supply Chain Management and the Environmental Impact of Production. Production Horticulture may now be found supporting the economies of less developed nations and consequently the final Chapter focuses especially on the impact of a changing environment on Crop Production Horticulture in Africa.

Volume 3, Social Horticulture brings the evolution of the Discipline firmly into the 21st Century. It breaks new ground by providing a detailed analysis of the value of Horticulture as a force for enhancing society in the form of social welfare, health and well-being, how this knowledge is transferred within and between generations, and the place of Horticulture in the Arts and Humanities. Volume 3 covers considerations of: Horticulture and Society, Diet and Health, Psychological Health, Wildlife, Horticulture and Public Welfare, Education, Extension, Economics, Exports and Biosecurity, Scholarship and Art, Scholarship and Literature, Scholarship and History, and the relationship between Horticulture and Gardening.

The value of Horticulture for human development was emphasised by Jorge Sampaio (United Nations High Representative for the Alliance of Civilisations and previously the President of the Republic of Portugal) in his opening address to the 28th International Horticultural Congress in Lisbon, 2010. He stated that Horticulture can achieve “a lot to overcome hunger and ensure food security”. This is in the face of estimates that the world’s population, particularly in developing countries, will reach 9.1 billion by 2050. Horticulture has especially important role in easing this burden. Intensive plant production has much to offer as urbanization continues at an accelerating pace. Shortly about 70% of the world’s population will choose to live in urban and peri-urban areas of many countries. Despite affluence in parts of the World many millions of the world’s population still continue to be undernourished and in poor health. Climatic change, over population, soil degradation, water and energy shortages, pollution, and crippling destruction of biodiversity are the challenges facing all of humanity. Horticulture in its Production, Environmental and Social facets offers important knowledge and expertise that will help minimise these changes. This is well explained in “Harvesting the Sun” in a digest recently published by the International Society for Horticultural Science. In summary form the international interactions between horticultural science, technology, business and management are displayed. This offers suggestions as to how, over the early part of the 21st Century, world food production must rise by at least some 110% to meet the demands of expanding populations in countries such as China, India, parts of Asia and in South America.

Considerable breadth and depth of intellect are demanded of those who seek an understanding of horticulture. This is not a discipline for the faint hearted since the

true disciple needs a considerable base in the physical, chemical and the biological sciences together with a knowledge of natural resources, linked with an understanding of the application of economics, engineering and the social sciences. Added to this should also come an appreciation of the artistic, historic and cultural dimensions of the Discipline. The teaching of fully comprehensive horticultural science courses in higher educational institutions has regrettably diminished worldwide. It is to be hoped that this Trilogy may go some small way in providing an insight into the scale, scope, and excitement of the Discipline as well as the intellectual rigour demanded of those who seek a properly proportioned understanding of it.

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Professor Geoffrey R. Dixon affectionately records his thanks to his mentor Professor Herbert Miles, then Head of the Horticulture Department of Wye College, University of London (now Imperial College, London) who challenged him to "define Horticulture". Regrettably, it has taken half a century of enquiry to respond effectively.

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