

Garden Natural History

Stefan Buczacki



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The aim of this series is to interest the general reader in the wildlife of Britain by recapturing the enquiring spirit of the old naturalists. The editors believe that the natural pride of the British public in the native flora and fauna, to which must be added concern for their conservation, is best fostered by maintaining a high standard of accuracy combined with clarity of exposition in presenting the results of modern scientific research.

Table of Contents

[Cover Page](#)

[Title Page](#)

[Editors](#)

[Editors' Preface](#)

[Author's Foreword and Acknowledgements](#)

[CHAPTER 1 British Gardens – the Background](#)

[CHAPTER 2 The Modern British Garden](#)

[CHAPTER 3 The Operations of Gardening and their Impact upon the Environment](#)

[CHAPTER 4 Gardens in the Context of the British Ecological Landscape](#)

[CHAPTER 5 The Garden as a Habitat to which Native Plants have Adapted](#)

[CHAPTER 6 The Garden as a Habitat to which Vertebrates have Adapted](#)

[CHAPTER 7 The Garden as the Route by which Alien Species have been Introduced](#)

[CHAPTER 8 The Slightly More Hidden Garden](#)

[CHAPTER 9 The Role of the Gardener as Conservator](#)

[CHAPTER 10 The Garden as an Inspiration for the Naturalist](#)

[CHAPTER 11 The Garden as a Natural History Educator](#)

[CHAPTER 12 The Future of the Garden and its Likely Role in our Natural History](#)

[References](#)

[Index](#)

[The New Naturalist Library](#)

[About the Author](#)

[Copyright](#)

[About the Publisher](#)

Editors' Preface

FOR MANY PEOPLE, a garden is the only easily accessible place to see plants and animals, and gardening provides the readiest opportunity for interacting with the natural world. The natural history on the doorstep deserves wider recognition. Although gardening is an exercise in applied natural history, there are few publications that introduce the cast and encourage observers to follow the ecological dramas unfolding under the leaves or in the compost heap. In this book, Stefan Buczacki reviews the diversity of organisms and processes waiting to be explored. Integrating gardening lore with horticultural and ecological science, he interprets familiar observations. He also offers gardeners recommendations for management to enhance wildlife, together with ideas that will enrich their appreciation of horticultural natural history. It is hoped that this much-anticipated addition to the New Naturalist series will stimulate further work on this relatively unexplored, yet accessible, world, and encourage gardeners to notice, perhaps even welcome, the unplanned diversity of organisms, often uninvited, that shares the garden.

Well known as an author and broadcaster on various aspects of gardens and gardening, and a connoisseur of New Naturalists, owning a complete collection of titles, Stefan Buczacki is the ideal author for a New Naturalist on *Garden Natural History*. We are delighted that he accepted the invitation to write this book for the series.

Author's Foreword and Acknowledgements

APART FROM Max Walters' *Wild and Garden Plants*, no previous New Naturalist volume has considered gardens in any other than a fleeting and superficial manner, let alone had the word 'garden' in its title. To a naturalist like myself who is also a gardener, this seems an astonishing omission. It is nonetheless an understandable one, as the garden has for long been considered something wholly artificial that has little in common with or relevance to 'natural' habitats, somewhere that has no part to play in 'A Survey of British Natural History'. I am privileged to be able to rectify the omission and correct the record, although for someone who thought the task would be straightforward, the exercise has proved a daunting journey of discovery. At the outset, I believed I had simply to tell a story based on my own lifetime's experience and observations in natural history and horticulture, and substantiate it with data from the scientific literature. But there was the rub. I had not reckoned on how tiny, disparate and perfunctory was the scientific literature, how sparse the studies of garden wildlife. Apart from birds, almost no group of organisms that live in gardens have been studied in relation to this particular habitat in any depth. Even the scientific literature of commercial horticulture was of little help, because arable cropping is so different in approach, practice and scope from domestic gardening.

The realisation that I had rather few facts to support my beliefs and ideas has resulted in a book that may be perceived as judgemental, dogmatic and opinionated. I make no apology for that, and whether readers agree or disagree with the views I have expressed and the conclusions I have drawn, can only articulate the fervent wish that those in a position to do so will now take matters into their own hands. I hope my fellow scientists will at last view the garden seriously, recognise its huge importance in the overall context of a threatened environment, and embark on the studies that are so urgently needed to show how it can most effectively be used and managed for the complementary purposes of enjoyment and conservation.

It is my pleasure to acknowledge with real gratitude the patience, understanding and forbearance of Myles Archibald and the Natural History staff at HarperCollins and the support and confidence expressed in me by the New Naturalist Editorial Board.

CHAPTER 1

British Gardens – the Background

AGARDEN IS ‘An enclosed piece of ground devoted to the cultivation of flowers, fruit or vegetables, often with defining word, as flower-, fruit-, kitchen- etc.’; alternatively, it means ‘Ornamental grounds, used as a place of public resort’ (OED). Today, without adjectival qualification, it carries two connotations: first, that it is essentially a non-commercial undertaking; and second, that it is attached to or associated with a dwelling place. These meanings are what I intend here, a consideration of what is sometimes called, certainly in North America, the ‘home garden’. Add an adjective (‘market’, ‘botanic’) and it can have other meanings, and although I shall have a few things to say about the botanic garden, the market garden is in effect a small arable farm and falls largely outside my scope.

Historically, it is impossible to see where farms end and gardens begin, but what can loosely be called the artificial management of plants has been a feature of human society for at least 10,000 years. It is known to have developed first in the area we now call the Middle East, especially the region presently occupied by Israel, Iran, Syria and Iraq, and it later spread from there to other parts of the eastern Mediterranean. Recent studies by a British and American research team at a site called Abu Hureyra have not only narrowed the likely geography to Syria, but also extended the timescale to a date around 13,000 BP (Moore *et al.*, 2000). The Abu Hureyra village discoveries neatly linked the first farmers to a hunter-gatherer culture that existed in the same locality for around 400 years before the growing of cereals, including rye, first began. These studies therefore place the origins of plant cultivation in the Late Upper Palaeolithic period, when the glaciers of the last ice age were still retreating from northern Europe. Later still, the organised growing of crops began in India, China and South America, so that by around 4,000 BP it was an established feature of societies in many parts of the world.

EARLY CULTIVATION OF PLANTS IN BRITAIN

In Britain, plants were being cultivated at an early date at the village site of Skara Brae on Orkney which, following its discovery in the mid-nineteenth century and preliminary study in the early twentieth, was at first believed to be an Iron Age ‘Pictish’ settlement. Following radiocarbon dating in the 1970s, however, Skara Brae was reinterpreted as Neolithic and is now known to have been inhabited between 5,200 and 4,200 BP (Fig. 1). Recent studies elsewhere on Orkney suggest that plants may have been grown at an even older locality which would push the origins of British crop cultivation back to around 6,000 BP. But the growing of crops does not make a garden. For me, a garden is an area that gives at least a modicum of pleasure as well as practicality to its owners. Here, however, the archaeological record can do little more than provide pointers, and precisely when the use of gardens for any sort of decoration first began is obscure. Quite possibly it arose through the careful choice of some of the more attractive among edible crops, herbs for instance, or, even earlier, as we have often thought, through the deliberate growing close to

FIG 1. Skara Brae on Orkney was inhabited between 5,200 and 4,200 BP and is probably one of the first sites in the



the home of appealing wild species that arose as weeds among the cereals. I admit it takes a leap of horticultural faith to interpret the presence in an ancient village of the seeds or pollen of field poppy *Papaver rhoeas* or corncockle *Agrostemma githago* as evidence that someone was either specifically tolerating or deliberately growing them; but it must have happened at some time. I have been interested to see the rather more precise expression of the same notion by Harlan & de Wet (1965), who believed prehistoric plants were divided into ‘domesticated crops’, ‘encouraged weeds’, ‘tolerated weeds’, ‘discouraged weeds’ and ‘noxious weeds’. I am not sure how they managed so carefully to analyse the prehistoric mind to discover this, but it seems pragmatic enough, and it would not have taken many seasons to realise which weed was which. My putative ancient ornamental garden would, I suppose, have contained ‘encouraged weeds’ only.

THE FIRST ‘GARDENS’

There is an intriguing claim by Groenman-van-Waateringe (1978) for palynological evidence of the earliest known garden in the Neolithic of the Netherlands. He postulates the existence of blackthorn *Prunus spinosa* as evidence for hedges being used to enclose small settlements, but whether these were real gardens is more a matter of semantics than palaeohorticulture. Conventional wisdom understandably places the origin of ‘proper’ gardening in Britain with the Romans and the Romano-British. There are indications of the existence of gardens at many villa sites in Britain, but the most extensive evidence of an ancient garden is at the late first century AD Romano-British palace of Fishbourne in Sussex. There the main body of the palace comprised four ranges enclosing a rectangular garden of around 100 by 75 metres with a further similarly sized garden to the south, closer to the sea (Fig. 2). There is evidence of a small kitchen garden and other more modest plots. The main garden was strictly formal, divided into two halves by a central path and created by terracing into a slope of clay and gravel and replacing the spoil with topsoil. There is a clear indication of trenches, amended with loam, being cut into the subsoil and indicating where deep-rooted plants, probably shrubs, were planted. The perimeter paths were hedge-lined, perhaps with box *Buxus sempervirens*, and further formality was achieved by an upright structure along the eastern side, presumably some sort of timber pergola. Fishbourne was clearly similar in overall concept to the

contemporary gardens of Italy itself, of which much more is known from paintings and archaeological evidence. It is a mistake, however,



FIG 2. The earliest proper gardens in Britain were at Roman and Romano-British sites such as Fishbourne in Sussex.

to consider these Roman (and Romano-British) gardens as entirely formal. On the Roman site at Latimer in Buckinghamshire (around AD 300), for example, Branigan (1973) found small areas close to the house that seemed to have been kept free of sheep and pigs, and he interpreted these as possibly informal kitchen plots or orchards. But more importantly, it is clear that the Roman garden, in concept and reality, made significant, even if coincidental, concessions to wildlife.

The Roman garden was, according to Jellicoe *et al.* (1986):

...at the centre of a network of feelings and inclinations, inherent in the Roman sensibility: the sense of universal life, expressed by the presence of divinities; a taste for luxuriant vegetation, picturesque topiary remaining exceptional, answering the desire to unite art and Nature; and flowing water.

But the best evidence of the importance of naturalism comes from no less a source than Pliny (V Letter 6): ‘Beyond the wall lies a meadow which owes as many beauties to Nature as all I have been describing within does to art’ (Bosanquet, 1907). The south garden at Fishbourne may perhaps have been just such a wild garden, one that easily led the eye from the south wing to the natural landscape beyond the tidal inlet (Cunliffe, 1971).

Knowledge of the types of plants that grew in Romano-British gardens is tantalising in what it does and does not reveal. There is ample evidence for the deliberate growing of native shrubs, including box, hawthorn *Crataegus* sp. and juniper *Juniperus communis* because their use as hedges can be inferred from their planting positions. There is ample evidence too for the growing of vegetables (Table 1) and it is commonly believed that vegetable cultivation was introduced to Britain by the Romans (Zeepvat, 1991). Practically all Roman vegetables in Britain, including cabbage *Brassica oleracea*, carrot *Daucus carota*, parsnip *Pastinaca sativa*, celery *Apium graveolens* and

turnip *Brassica rapa* subsp. *campestris*, were derived from species that were probably native, although it seems likely that the Romans brought at least some selected forms with them. Many culinary and medicinal herbs were grown too, including coriander *Coriandrum sativum*, dill *Anethum graveolens* and fennel *Foeniculum vulgare*. These were almost certainly introduced, although they have close relatives among the native flora. Some other garden crops have been claimed as Roman introductions to Britain, but macrofossil records substantiating these claims cannot be found.

TABLE 1. Garden and orchard crops identified from macrofossils at Roman sites in Britain (after Murphy & Scaife, 1991).

<i>Anethum graveolens</i>	dill	<i>Mespilus germanica</i>	medlar
<i>Apium graveolens</i>	celery	<i>Morus nigra</i>	black mulberry
<i>Asparagus officinalis</i>	asparagus	<i>Papaver somniferum</i>	opium poppy
<i>Beta vulgaris</i>	beet	<i>Pimpinella anisum</i>	anise
<i>Brassica</i> spp.	cabbages	<i>Pinus pinea</i>	stone pine
<i>Castanea sativa</i>	sweet chestnut	<i>Pisum sativum</i>	pea
<i>Corylus avellana</i>	hazel	<i>Prunus avium</i>	cherry
<i>Coriandrum sativum</i>	coriander	<i>Prunus</i> cf. <i>cerasifera</i>	cherry plum
<i>Cucumis sativus</i>	cucumber	<i>Prunus</i> cf. <i>cerasus</i>	dwarf cherry
<i>Daucus carota</i>	carrot	<i>Prunus domestica</i> s.l.	bullace/damson/plum
<i>Ficus carica</i>	fig	<i>Prunus persica</i>	peach
<i>Foeniculum vulgare</i>	fennel	<i>Pyrus communis</i>	pear
<i>Fragaria vesca</i>	strawberry	<i>Rubus fruticosus</i> agg.	blackberry
<i>Juglans regia</i>	walnut	<i>Rubus idaeus</i>	raspberry
<i>Linum usitatissimum</i>	flax	<i>Vicia faba</i> var. <i>minor</i>	horse bean
<i>Malus</i> sp.	apple	<i>Vitis vinifera</i>	grape-vine

Evidence for the ornamental elements in the Roman garden presents more of a problem, although perhaps not as great as some archaeologists have thought. Zeepvat (1991) said:

As regards the ‘pleasure’ gardens, the available evidence is slight. With respect to flowers, many would be domestic versions of native plants, and as such would not be distinguishable in environmental analysis.

That would be true if the only flowers being grown in Roman-British gardens had been collected from nearby, which would imply that the gardeners were little more advanced in their ambitions than the prehistoric weed cultivators. That seems highly improbable, and I would have expected that even if he was restricted to native species, the Roman or Romano-British garden owner might have wanted to plant forms that he could not see in the neighbouring countryside, and that would therefore show up in seed or pollen analyses as alien to the locality.

Whilst there were a number of what I call ‘near-exotics’ – plants such as peaches *Prunus persica* that certainly do not grow here wild but originate from not far away – and a few truly exotic plants (cucumbers *Cucumis sativus* among them), the Romano-British garden was largely a garden of native plants or their close relatives. As such it could easily have been a wildlife haven and this was a pattern that was to continue in British gardens in one manifestation or another until the nineteenth century.

After the departure of the Romans in the fifth century, life in Britain changed dramatically, although it is now clear that the Anglo-Saxon period was far from the Dark Ages of traditional

textbook teaching. Just over a century ago an authoritative writer on garden history could say with little fear of contradiction:

The fall of the Roman Empire, and the subsequent invasions of barbarians, struck a death-blow to gardening as well as to all other peaceful arts. During the stormy years which succeeded the Roman rule in Britain, nearly all knowledge of horticulture must have died out. (Amherst, 1896)

It is now recognised, however, that it is essentially the absence of almost any documentary record, and an awareness that it was a period of constant internecine warfare, which cloud our view of what was in some respects a time of great artistic creativity. A culture that could produce the Alfred Jewel, the artefacts of the Sutton Hoo ship burial and the Lindisfarne Gospels, and that was settled rather than nomadic, might be expected to have appreciated the pleasure, beauty and solace of the garden almost as much as the Romans before them or the medieval nobility and clergy later. It is our loss that we know almost nothing of it and are limited to what can be gleaned from archaeology and from the Old English plant names that have survived in recognisable form. The fact that essentially ornamental plants such as *lilie* (lily), *mealuwe* (mallow), *popæg* (poppy) and especially *róse* (rose) existed in Old English alongside the more utilitarian *béte* (beet), *rædic* (radish) and *hænep* (hemp) indicate that at least they were noticed, although it is of course arguable that this was for their medicinal rather than aesthetic appeal. Harvey (1979) considered that ‘the basis of English gardening a thousand years ago, consisted...of fewer than one hundred different plants’. The archaeological evidence, however, is scant (Murphy & Scaife, 1991).

Not until after the Norman Conquest were there written references to English gardens and gardening. One of the first and most celebrated indications that eleventh-century gardens could be pleasing to the eye as well as functional comes in the writings of the Benedictine monk, Eadmer of Canterbury (c.1060– c.1126) (Rubinstein, 2004; Southern, 1963). Eadmer wrote of King William Rufus visiting Romsey Abbey around 1092 to see the young Scottish Princess Matilda (also known as Edith) (1080-1118), who was later to marry King Henry I. She was being educated there by the nuns but, suspicious of the King’s motives, the Abbess distracted William and his entourage by inviting them to see the garden wherein grew ‘roses and other flowering herbs’ while Matilda slipped out under a veil. It seems evident, therefore, that the garden must have been well worth a visit – after all, the King and his chums would be unlikely to have been distracted by something that was little more than a vegetable plot. Interestingly, Romsey Abbey still proudly displays a relic of its early horticultural history in the shape of the ‘Romsey Rose’, a rather pathetic-looking object found in the 1970s in an ancient scaffolding hole behind a twelfth-century wall painting. Any notion that it was one of the flowers that entranced its ancient residents and visitors can, however, be dispelled. It was more likely to have been flavouring for their broth, as it is apparently some form of shrivelled *Allium* bulb, possibly garlic.

It was not until the following century that the first illustrations of English gardens appeared, among the earliest a beautiful plan in the Eadwine Psalter (Cambridge, Trinity College M S R.17.1), created around 1165 and showing the features associated with the monastic buildings at Canterbury (Fig. 3). It depicts the cathedral water supply, orchard, vineyard and ‘herbarium’ with its trellises. Over the following three centuries, gardening spread through England, preeminently among the monastic houses, but also among the homes and palaces of the grander secular clergy and of the nobility. As people travelled more and further into the European continent and were influenced by



FIG 3. The twelfth-century Eadwine Psalter includes the first illustrations of English gardens, those associated with monastic buildings in Canterbury.

an increasing number of alien plants were seen here too, although most were still essentially European and most not far removed from the wild plants of the English countryside. Arguably, one of the most significant trends for the wildlife of these medieval gardens was that they became increasingly isolated from the neighbouring area by the erection of walls.

The practice of enclosing an area of land within a palisade or even a wall had a multiplicity of benefits. Around the wide expanse of the park, it served to confine deer and boar for hunting, and kept out potential predators such as wolves and the local peasantry. But on a smaller scale, it could also be applied to the garden where, just as in the enclosed housing estate garden of today with its 2-metre panels of softwood fence, potential pest species such as foxes, badgers, cats and dogs might be kept a bay. For the medieval garden, this enclosure might be a palisade or stockade, but might as easily have been an enclosed courtyard surrounded by buildings. One of the earliest recorded examples of an enclosed garden was that of King Henry I at Havering-atte-Bower in Essex, while King Edward I's garden at the Tower of London in 1274 was said to be surrounded by an earthen wall (Harvey, 1979). Later, King Henry III commanded works to be undertaken at Woodstock:

To make round about the garden of our Queen two walls, good and high, so that no-one may be able to enter, with a becoming and honourable herbary near our fish pond...(Liberate Roll, 34 Hen. III., m. 6)

Such enclosure would also assist in the development of a microclimate within the garden and thus in the elevation of temperature, lengthening of the growing season, enhancement of humidity, minimising of wind and the many other environmental features that affect plant growth and maturity. It was soon appreciated that the enhanced warmth and shelter lent themselves to the growing of fruit such as peaches, cherries and vines, but also encouraged aphids, snails and other pests and must incidentally have increased the garden bird population no end.

The ever-increasing use of hedges and of clipped shrubs – which by the early Tudor period were taking the form of topiary – valuably increased bird nesting sites. The arbour too brought more bird life to the garden. There is some uncertainty about what was meant by ‘arbour’ in early writings, but in the modern sense of a small, enclosed and partly covered area with a turf seat surrounded by climber-clad trellis or trained trees they seem to have been here at an early date. Evidence for a fourteenth-century origin is often deduced from the fact that they were described in *The Flower and the Leaf*, a piece long attributed to Chaucer, though now thought to be a pseudo-Chaucerian creation from the sixteenth century. Nonetheless, by 1523 the poet John Skelton (1460–1529) was noticing the phenomenon:

*The clowdis gan to clere, the myst was rarified
In an herber I saw, brought where I was,
There birdis on the brere sange on euery syde...*

John Skelton, *The Garlande of Laurell* (Scattergood, 198)

Pleached alleys too, with a disproportionately large number of twiggy branches, attracted both birds and insect pests, although they were spared that scourge of modern fruit tunnels and espaliers, the woolly aphid *Eriosoma lanigerum*, which did not appear here until Sir Joseph Banks found it in London in 1787. Another of the characteristic features of the Tudor garden, which became especially popular after the early sixteenth century, was the knot, a planting of low hedges, often of box, intricately clipped to give the impression of knotted ropes. The contemporary resurgence of interest in knot gardens has also been blighted, in a literal sense, by a recent arrival in the shape of the fungal pathogen *Cylindrocladium buxicola*, which causes a serious leaf and shoot blight of box, and this is probably yet another instance of historic gardens being considerably healthier than their modern counterparts – the absence of pesticides and labour-saving aids notwithstanding.

Although the lawn as we understand it today was not possible before Budding’s invention of the lawnmower in the nineteenth century (p. 35), closely cut areas of grass date back much further. Before Budding’s lawnmower, the

FIG 4. The geometric formality of the Tudor garden is well seen in the reconstruction at Tudor House in Southampton.



scythe was the means of cutting grass, and in skilled hands it does seem to have been possible to cut grass both short and even. Well-kept turf was being bought, sold and admired as early as the thirteenth century: Colvin (cited in Landsberg, 1995) reported that in July 1272, Eleanor of Castile (1246–90) was paying one of her squires 3d. for night-time watering of two cartloads of turves that had been laid in the previous month. Undoubtedly, then as now, the all-grass lawn was an ideal rarely achieved, and it seems to have merged imperceptibly into flowering turf (often incorrectly referred to today as a ‘flowery mead’, which was strictly ‘a carpet bejewelled with flowers as depicted in medieval paintings’) rather as some modern gardeners excuse their weed-strewn lawns as wild-flower gardens.

THE INTRODUCTION OF EXOTIC PLANTS

As the sailors of Tudor England crossed the world and returned with their treasures, so the numbers of exotic or ‘outlandish’ plants, especially but not exclusively from the Americas, increased in British gardens: crown imperial *Fritillaria imperialis* (Fig. 5; pre-1590), black hellebore *Helleborus niger* (sometime in the sixteenth century), balsam *Impatiens balsamea* (1596), jasmine *Jasminum officinale* (1548), snowflake *Leucojum autumnale* (1629), mock orange *Philadelphus coronarius* (1596) and tagetes *Tagetes patula* (1573), among many. The steady trickle became a constant flow, and although it was not to rival the nineteenth-century flood, these new introductions played an increasingly important part in our gardens. Some brought their own livestock in the form of specific pests and diseases with them, while all presented challenges to the native wildlife to which they adapted with varying success. A late sixteenth-century garden arrival that is often cited as an example of how valueless introduced trees are in enhancing our biodiversity is the sycamore *Acer pseudoplatanus*, and certainly this has fewer other organisms associated with it, much less dependent on it, than almost any other British tree. Apart from the fungi *Rhytisma acerinum*, the cause of tar spot disease, and *Cryptostroma corticale*, the cause of sooty bark, several ubiquitous species of aphid and sooty mould and another introduction, the grey squirrel *Sciurus carolinensis*, it is hard to think of anything that would suffer significantly by sycamore’s absence. By contrast, one of the plants that arrived at this time and that has arguably changed garden wildlife more than any other was *Solanum tuberosum*, the Andean potato, introduced from Colombia and Peru around 1570 (Fig. 6). Admittedly, a number of the organisms affecting it are viruses, and therefore hardly to be noticed by the casual observer, but the list of pests and pathogens that are now associated with potatoes in Europe (and most in Britain)



FIG 5. *Fritillaria imperialis*, one of the many exotic species introduced to British gardens before the end of the sixteenth century.

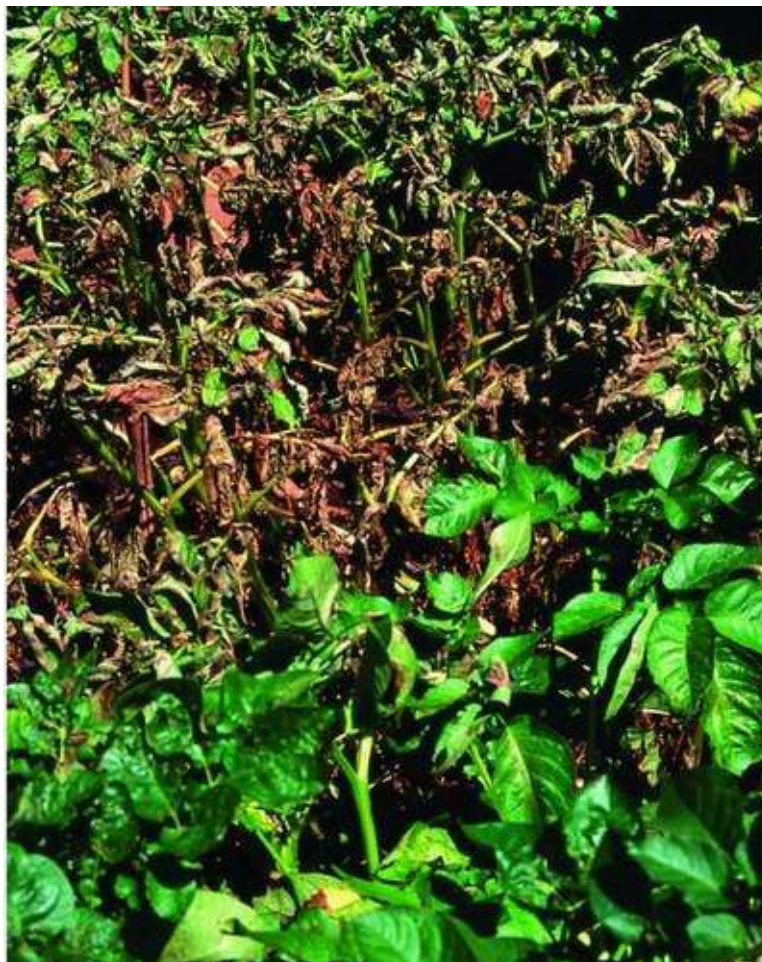


FIG 6. The potato, introduced from the Andes around 1570, brought with it numerous pests and diseases – including blight caused by *Phytophthora infestans*.

is still remarkably long for a non-native half-hardy plant (Table 2). Although some are exclusive to potatoes, a considerable number, especially among the insect pests, have a wide range of other host plants too.

TABLE 2. The most common pests and diseases of potatoes in Europe/Britain.

INSECTS AND MITES

Agriotes spp.
Aphis fabae
A. gossypii
A. nasturtii
Aulacorthum solani
Conodorus spp.
Ctenicera spp.
Empoasca devastans
Helicoverpa armigera
Leptinotarsa decemlineata
Limonius spp.
Macrosiphum euphorbiae
Myzus persicae
Phthorimaea operculella
Spodoptera exigua

NEMATODES

Ditylenchus destructor
D. dipsaci *Globodera pallida*
G. rostochiensis
Meloidogyne chitwoodi
M. hapla
Paratrichodorus spp.
Pratylenchus penetrans
Trichodorus spp.

VIRUSES

Leaf roll virus
Mop top virus
Tobacco rattle virus
Virus A (mild mosaic)

Virus M

Virus S

Virus X (mild mosaic)

Virus Y (severe mosaic)

BACTERIA

Clavibacter michiganensis var. *sepedonicus* (ring rot)

Erwinia carotovora ssp. *atroseptica* and subsp. *carotovora* (blackleg, soft rot)

Streptomyces scabies (common scab)

FUNGI AND OOMYCETES

Alternaria solani (early blight)

Botrytis cinerea (grey mould)

Colletotrichum coccodes (black dot)

Fusarium solani var. *coeruleum* (dry rot)

Helicobasidium purpureum (violet root rot)

Helminthosporium solani (silver scurf)

Phoma exigua var. *exigua* (gangrene)

P. foveata (gangrene)

Phytophthora erythroseptica (pink rot)

P. infestans (late blight)

Polyscytalum pustulans (skin rot)

Pythium ultimum (watery wound rot)

Rhizoctonia solani (black scurf)

Sclerotinia sclerotiorum (stalk break)

Spongospora subterranea (powdery scab)

Synchytrium endobioticum (wart)

Verticillium alboatrum (wilt)

V. dahliae (wilt)

Data taken from Hide & Lapwood, 1992; Evans & Trudgill, 1992; Raman & Radcliffe, 1992; Hooker 1986; Valkonen, 1994.

The demise of monastery gardening came, unsurprisingly, with the demise of the monasteries themselves at the hands of Henry VIII and the Reformation. Commonly the only significant feature to remain was the fishpond, which may thus have played a part in one of the more improbable aspects of garden natural history in helping to establish the most important edible pond fish such as common carp *Cyprinus carpio* as naturalised British species, and to spread more widely formerly localised natives such as the pike *Esox lucius*, perch *Perca fluviatilis* and tench *Tinca tinca*.

As kitchen gardening prospered and expanded through the sixteenth and seventeenth centuries, and as ever more lush and luscious exotic crops were grown, so garden wildlife prospered at its

expense. The bloated and distorted reproductive and vegetative parts that are the very essence of vegetable and fruit crops attracted molluscs and diptopods, insects and rodents in ever increasing numbers, and the garden was now starting to become the preferred habitat for a considerable number of them. There was little that could be done: pick them off by hand ‘and tread them under foot’ was William Lawson’s contribution to snail control (Lawson, 1618). Moles *Talpa europaea* also caused much anxiety because they disfigured the formality and neatness of the ornamental garden. The gardeners of the time had little more idea or success than their counterparts today in controlling them.

Take red herrings and cutting them in pieces burn the pieces on the molehills, or you may put garlicke or leeks in the mouths of their Hills, and the moles will leave the ground. I have not tried these ways, and therefore refer the reader to his own tryal, belief or doubt. (Sharrock, 1694)

A garden, often a good garden, was becoming the *sine qua non* for every house of note. Celia Fiennes (1662–1741), who travelled extensively throughout England and made her ‘great journey’ on horseback in 1698 (Morris, 1947), found and described gardens everywhere she stopped and made especial mention of the ‘waterworks’ then becoming so fashionable under the Dutch influence of William and Mary. But indoor gardening too, in glasshouses provided with stove heat, was on the increase for those who could afford it. By the early eighteenth century, the garden at Fulham first made famous in Queen Elizabeth I’s time by Archbishop Edmund Grindal had so prospered under Bishop Henry Compton that:

He had a thousand species of exotick plants in his stoves and gardens, in which place he had endenized [there’s a word due for a comeback] a great many that have been formerly thought too tender for this cold climate. (Switzer, 1718)

No doubt Bishop Compton endenized (naturalised) a considerable number of exotick pests too. It is not recorded when such everyday garden animals as the glasshouse whitefly *Trialeurodes vaporariorum* (Fig. 7) or mealybug *Pseudococcus*



FIG 7. The glasshouse whitefly *Trialeurodes vaporariorum* came to Britain from somewhere in ‘the tropical and subtropical Western Hemisphere’ at an unknown date.

obscurus first arrived here, but how Bishop Compton and his contemporaries managed to keep

glasshouse pests of any sort under even a modicum of control is anyone's guess. Subsequently, the unregulated flow of subtropical plants into Britain to satisfy gardeners' demands meant that whiteflies and mealybugs among others were probably well established by the time the repeal of the Glass Tax 1845 led to a vast increase in glasshouse gardening in the nineteenth century; although it is worth bearing in mind that before 1833, almost all plant imports from far-flung places were in the form of seeds on which relatively few pests (although a fair number of diseases) are transmitted. The significance of the year 1833 was that it heralded the first practical demonstration of the value of the Wardian case, an enclosed glass plant container invented by the botanist Nathaniel Bagshaw Ward (1791–1868). Ward sent plants in such a travelling case to Australia and:

...when opened there months later, the plants inside were found to be still growing sturdily; the cases were then refilled and on the return journey their contents again passed unharmed through snow and equatorial heat alike. (Allen, 1994)

By the time the glasshouse gardeners were grappling with their sap-sucking pests, the gardening English were beginning to tire of formality, of neat clipped lines and of topiary around their houses (Fig. 8). Joseph Addison expressed it most succinctly:

Our British gardeners, instead of humoring Nature, love to deviate from it as much as possible. Our Trees rise in Cones, Globes and Pyramids. We see the marks of scissors upon every Plant and Bush. I do not know whether I am singular in my Opinion, but for my own part, I would rather look upon a tree in all its Luxuriance and Diffusion of Boughs and Branches than when it is cut into a Mathematical Figure...(Addison, 1712)

Addison certainly was not singular in his opinion, and whilst the landscape movement which these sentiments presaged made no impact on the everyday essentially subsistence plots that represented gardens to the majority of the population, it certainly did on the landed gentry. Only 16 years later – nothing in the life of a great garden – the delightfully named Batty Langley was asking 'Is there anything more shocking than a stiff regular garden?' (Langley, 1728). The boundary walls went, replaced by the ha-ha, and the landscape all but lapped at the steps of the house.

The pivotal garden of the period was Stowe, where Charles Bridgeman (d. 1738), William Kent (1686–1748) and John Vanbrugh (1664–1726) in turn

FIG 8. Neat clipped lines and topiary became important in English gardens from the early Tudor period. Haddon Hall, Derbyshire.



remodelled the landscape (Fig. 9). It was followed by numerous others, all great, all grand, created by a succession of disciples, most notably Lancelot 'Capability' Brown (1716-83) (who worked at Stowe early in his career) and Humphry Repton (1752-1818). Repton was more cautious than his predecessors and was content to retain a flower garden, 'detached and distinct from the general scenery of the place', but in need of being 'protected from hares and smaller animals by an inner fence' (Repton, 1803).

These gardeners are remembered in equal measure both for what they created and for what they destroyed. For the landscape park was not an addition but a substitution. The formal gardens were to a greater or lesser degree swept away, the boundaries disappeared, formal water features vanished, rivers were dammed and the topography reshaped. It was an idealised landscape of trees, grass and water, a contemporary eighteenth-century view of a classical Arcadia and, ironically, apart from the occasional temple and folly, it was almost a temperate equivalent of a habitat then awaiting discovery by European eyes: the tropical African savannah (Fig. 10). A limited but important range of native and non-native trees dictated the overall appearance, the fallow deer *Dama dama* became the *sine qua non* among garden animals, and the landscaped park turned into a new, semi-natural habitat with a flora and fauna uniquely its own. The

FIG 9. Stowe was the pivotal garden of the English landscape movement where Charles Bridgeman, William Kent and John Vanbrugh in turn remodelled the landscape. The artificial ruins were probably modelled by Kent.



FIG 10. The English landscape garden is, paradoxically, reminiscent of another landscape its creators never saw – the tropical African savannah.

word parkland passed into the currency of the English language with a meaning understood by all, and it is as familiar in field guide habitat descriptions today as sand dune, swamp and moor. I shall refer again to the characteristic wildlife of this remarkable and intriguing habitat, one that has been described, perhaps a trifle unfairly, as the only uniquely English contribution to garden style.

The kitchen garden, meanwhile, offered challenges of its own in an evergrowing obsession with the cultivation of the tender and exotic. Cucumbers, melons *Cucumis melo* and above all pineapples *Ananas comosus* demanded the finest and most inventive horticultural skills from gardeners at great houses everywhere. *Botrytis* grey mould and woodlice thrived as never before. And so it was as the century turned again and the Victorian age beckoned. Gardening and the garden environment were about to undergo their greatest revolution.

THE NINETEENTH-CENTURY GARDENING REVOLUTION

The number of plant introductions during the nineteenth century was greater than those of all previous centuries combined. South Africa and then Australia contributed annual flowers, China and other regions of the Far East contributed perennials and shrubs, as – on a large but much less well-lauded

scale – did Chile and other parts of South America. To take one example, where would modern British gardens and modern British whiteflies be without South American fuchsias? Over 4,000 *Fuchsia* species and cultivars are available to today's gardeners, yet apart from a brief eighteenth-century experience with a geographical 'outlier' – the Hispaniolan *F. triphylla*, grown by Philip Miller at the Chelsea Physic Garden – the majority did not reach Britain until well into the nineteenth century (Fig 11). The first hybrid, 'Standishii', derived from *F. fulgens* and *F. magellanica*, did not appear until 1839. The impact on British gardening of what are, in most cases, tender plants, is hard to overstate. Quite apart from their almost endless summer flowering season, fuchsias are usually overwintered in more or less actively growing condition in greenhouses, either as cuttings or mature stock plants, and thus provide year-round sanctuary and



FIG 11. Fuchsia species flooded into Britain in the nineteenth century from South America, but the origin of fuchsia rust *Pucciniastrum epilobii*, which also, as here, occurs on native species of *Epilobium* (willowherbs), is uncertain.

a haven not only for whiteflies but for innumerable aphids (at least some of them native species) and vine weevils *Otiorhynchus sulcatus*. All these are non-host-specific pests and thus we have a situation in which one of the most popular flowers of the modern domestic garden is acting as a reservoir for three of its most significant insect pests.

In our warm summers, fuchsias are also a food plant for one of the most magnificent of European caterpillars, the increasingly common 8-centimetre long, eyed larvae of the elephant hawk moth *Deilephila elpenor*; and they are common hosts too for a fungus disease now generally known as

fuchsia rust *Pucciniastrum epilobii*. It is a matter for speculation how common these organisms were in the past. Elephant hawk moths have a fairly catholic diet and, in addition to fuchsia, feed on species of evening primrose (*Oenothera*), willowherb (*Epilobium*), bedstraw (*Galium*), vine (*Vitis*) and bog-bean (*Menyanthes*). Fuchsia rust, however, like most rusts, is more conservative. It also occurs on native species of willowherbs which are in the same family as *Fuchsia* (Onagraceae), but its alternate host is spruce (*Abies*), not a native plant, and its natural geographical origin is uncertain, a situation compounded by the existence of several races, not all able to infect all hosts.

One of the least natural outlets for the nineteenth-century influx of tropical and subtropical annuals and tender perennials was the planting style that became known as carpet bedding. Although never a feature of small home gardens, it found much favour in the high Victorian country house garden and in the increasing number of municipal park flower gardens that became popular towards the latter part of the century. Carpet bedding was (and in few places such as seaside promenades, still is) the close planting of bedding plants chosen principally for their foliage and arranged in patterns to give the appearance of oriental carpets (Fig. 12). Sometimes the flowers are sheared off to enhance the foliage effects. Whilst no doubt heaven for slugs, carpet bedding did little for garden biodiversity, and when problems arose, they spread with the rapidity that is a feature of monocultures everywhere. With no species breaks, a host-specific pest or disease had ample freedom to roam.

But carpet bedding was an oddity, a rather short-lived curio, and a far more important gardening movement was to follow because, ironically, the century that saw the greatest number of exotic plant imports also gave rise to a style often referred to as 'a return to naturalism'. Although many horticulturists contributed to it, the name with which it is most usually associated is that of the Irishman William Robinson (1838–1935). He has been described (Allan, 1982) as the father of the English flower garden (partly because that was the title of his most successful book (Robinson, 1883)), but in truth, while he added many original



FIG 12. Victorian bedding schemes included many low-growing hardy and tender annuals as well as clipped foliage which was used for carpet bedding.

ideas, it was as its populariser that his contribution endures. He was a man '[who] to a considerable degree...engineered the creation of his own myth' (Elliott, 1985). The style promulgated by Robinson and his colleagues, especially and most famously Gertrude Jekyll (1843–1932), was one of soft herbaceous plantings, of carefully blended colours and not a little use of native plants. It found

immediate and more or less enduring favour in gardens of all sizes, although in the latter half of the twentieth century ~~all-herbaceous plantings were modified by the inclusion of shrubs to give better~~ year-round appeal and less labour input (p. 41). Neither Robinson nor Jekyll mentioned biodiversity by name – hardly surprising since the word did not appear until 1986 (Wilson, 1988) – but there is no doubt that they were familiar with its concept.

Robinson and Jekyll close the nineteenth century, open the twentieth and presage the dawn of the modern garden to which I devote my next chapter. But it is worth reflecting again on the changes in domestic horticulture wrought by nineteenth-century society. What made the pre-nineteenth-century garden a place largely in harmony with wildlife had little to do with the garden style favoured at any particular time. Whether formal courtyard, flowery mead or landscaped park, the historic English garden and its gardeners simply shared an empathetic way of life with the countryside around them, and whilst some exotic species had been grown here since the earliest times, gardening was still predominantly the cultivation of native or at least European plants. Three things changed all that. First, the coming of industry, its associated pollution and the development of poisonous pesticides and artificial fertilisers altered the natural history of the garden from the late eighteenth century onwards in a way from which only in the past decade or so has it been able to stage any serious sort of recovery; a theme to which I allude again in Chapter 3. Second, the expansion of the British Empire, the opening up of new areas of the globe to exploration and the activities of numerous plant collectors led to an influx of alien vegetation into these islands to such an extent that our flora would never be the same again. Finally, and within our own lifetimes, the freedom of travel for all and the international movement of plants have brought the experience of exotic plant pests and diseases within the reach of every home gardener.

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