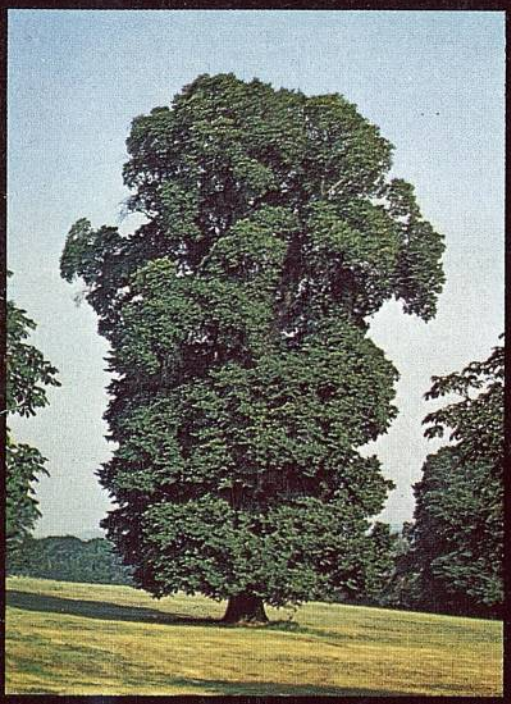
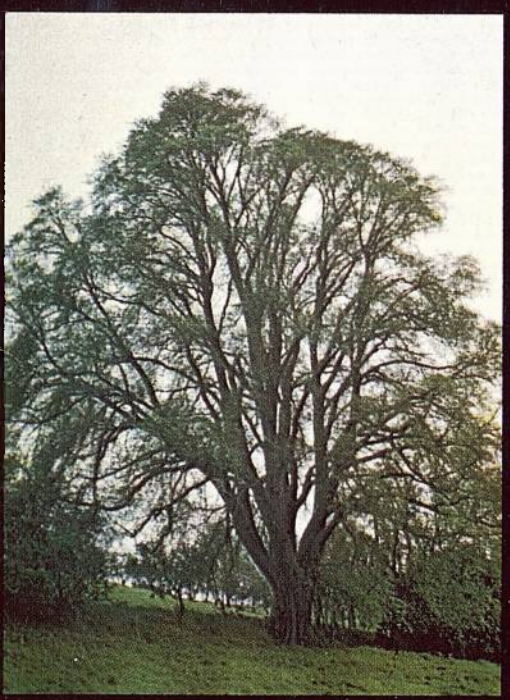


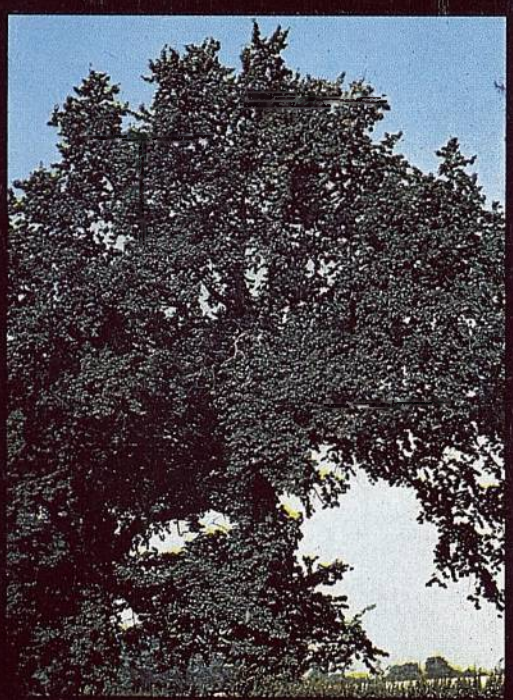
Forestry Commission
Booklet 42

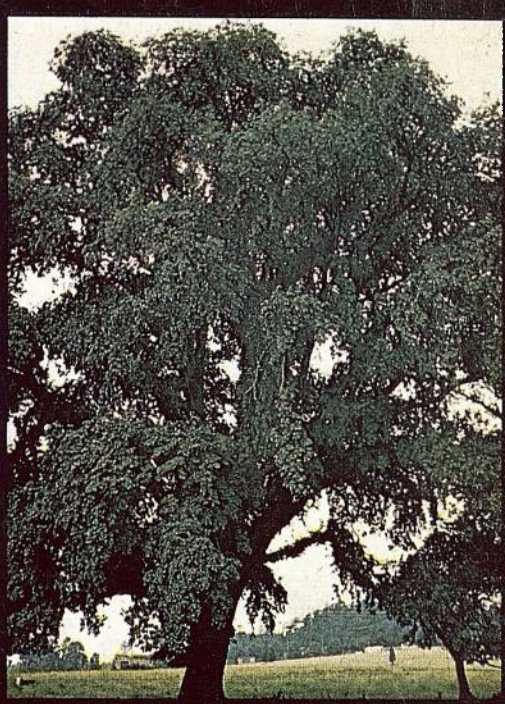


# Field recognition of British Elms

J Jobling A F Mitchell







## Colour of leafy sprays

Upper surface

Under surface

## Key to cover layout

| | | |
|---|---|---|
| **English elm** Farnham Park, Surrey | | |
| **Wych elm** Suffolk | **Dutch elm** Overton, Hants. | **Huntingdon elm** Westonbirt Arboretum, Glos. |
| **Smooth-leaved elm** Chilton Foliat, Berkshire | **Cornish elm** Salisbury Cathedral, Wilts. | **Wheatley elm** Stowe, Bucks. |

FORESTRY COMMISSION

# Field recognition of British Elms

by J. Jobling, B.Sc.
and A. F. Mitchell, B.A., B.Agric.(For.), V.M.H.
*Forestry Commission*

London
Her Majesty's Stationery Office
1974

# Contents

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# Introduction

The devastating spread of Dutch elm disease across much of England and the attendant publicity have led understandably to a greatly increased awareness of our complex and uniquely varied elm population and to an interest in elm recognition by a large number of persons and organisations concerned with control measures and conservation.

A simple leaflet was prepared and duplicated in 1972 and distributed to surveyors and inspectors, to help with the identification of elms in the field. This proved to be such a useful guide that the information it contained is being made available to a wider public. The original text has been revised and expanded and supplemented by line drawings of winter twigs and photographs of trees and bark.

Many of those who have been called upon to survey infected areas or to mark or fell diseased trees have had no training in botany, and have difficulty with identification. Even those who have worked with trees for many years are sometimes confused. Many of the botanical descriptions of elms are based on variable or overlapping characters, and there have been frequent changes of name due to the absence of any real agreement by authorities on the status of some of the species and hybrids.

Nevertheless, most of the difficulties are illusory or unnecessary. For all ordinary purposes elm trees can nearly always be assigned to one or other of the species and hybrids by using major features and without resort to minutiae or to any measuring. The primary features which can often be used to provide an absolute identification of a mature elm at any time of the year are the characteristic form of the crown and the colour and appearance of the bark. The shape of the leaf and the texture of the upper surface of the leaf are important secondary, smaller-scale features.

The photographs, line drawings and accompanying descriptions in this booklet have been selected to show these features and to be of use in the field. In general it may be said that crown and stem habits of mature trees vary so little within a species or hybrid even on different sites, that these alone can be used to identify all elms other than some very scarce varieties and hybrids. The very variable Smooth-leaved elm, *Ulmus carpinifolia,* seems to give rise to most of the problems, but this elm and all its forms are readily recognised by the smooth, leathery upper surface of the leaf. The problems are thus fairly readily solved.

Young trees are much more difficult to identify from crown and stem habit, and it is always best with these to rely largely on selected foliage samples.

Trees in woodland, whose shapes have been affected by the surrounding crop, as well as specimens in the open that have been pollarded, should be identified from foliage samples as well.

When foliage samples are used they must be from the slowest growing or dwarf shoots, avoiding epicormic and sucker growth. All vigorous shoots bear variable and often atypical foliage even on mature trees, and these should certainly be avoided. Elms are well known for this variation in leaf size and shape on a single tree. All the line drawings of foliage are taken from typical slow growing or dwarf shoots. The photograph of a small branch inside the front cover shows both dwarf shoots and vigorous lateral shoots.

### Nomenclature

For guidance on scientific names used in this booklet reference has been made to the standard work *Flora of the British Isles* (Clapham *et al.* 1962, 2nd edition). This contains the descriptions and keys widely used in this country for identification of plants and the use of its nomenclature herein will avoid any confusion which might arise by using less familiar names.

However, one innovation has been thought necessary. The Smooth-leaved elm is described in two geographical varieties and the main East Anglian population. Logically, the term *"Ulmus carpinifolia"* includes all three, but the description under this name is that of the East Anglian population only. This has therefore been typified as *"Ulmus carpinifolia* var. *carpinifolia"*.

The elms described on the following pages are the species, varieties and hybrids commonly found in the countryside, and in parks and at the roadside in towns. They are:

English elm, *Ulmus procera* Salisbury
Wych elm, *U. glabra* Hudson
Smooth-leaved elm, *U. carpinifolia* Gleditsch var. *carpinifolia*
Cornish elm, *U. carpinifolia* var. *cornubiensis* (Weston) Rehder
Wheatley elm, *U. carpinifolia* var. *sarniensis* (Loudon) Rehder
Dutch elm, *U.* x *hollandica* Miller 'Hollandica'
Huntingdon elm, *U.* x *hollandica* Miller 'Vegeta'.

More than 60 scientific names and more than 20 common names have been ascribed to the British elms. As the reader may come across some of them in technical or trade literature they are listed for reference purposes on page 22. So as not to increase confusion unnecessarily the names of horticultural cultivars propagated in small numbers by the nursery trade for solely ornamental purposes, and names used by the timber trade, often on a regional basis, have not been included.

## Identification

A key for stem, branch and crown shape of mature trees is given on page 20; it is based on an earlier published key (Mitchell, 1967) which included descriptions of twigs. This information on twigs is now contained in the following section which deals with individual species and hybrid characters.

# Illustrated descriptions of seven elms

# English elm

English elm, *U. procera*
Abundant from Plymouth north east to York except East Anglia where infrequent.

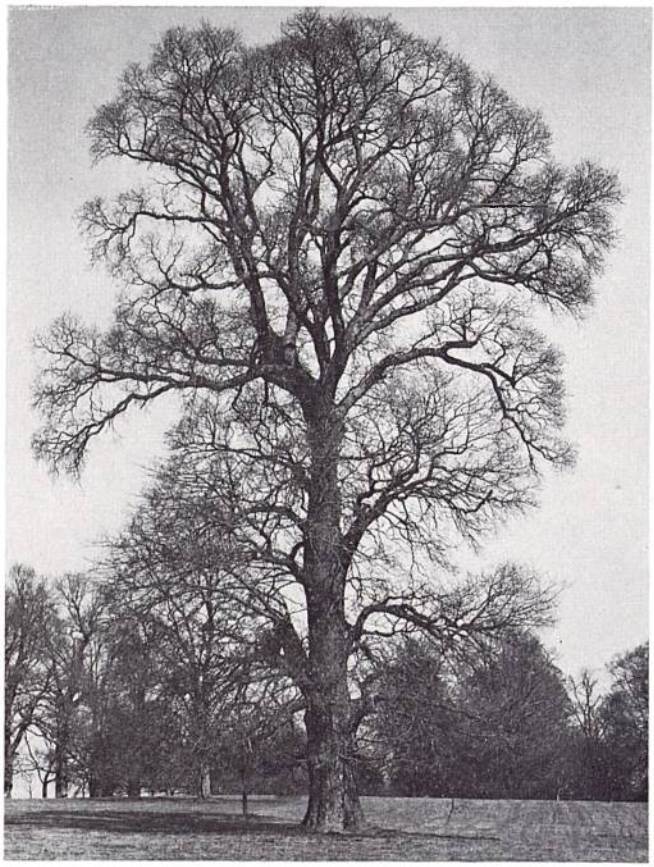

*Fig. 1:* Open-grown English elm, showing the typical rounded upper crown, in Farnham Park, Surrey.

*Fig. 2:* Bark of English elm. Note the rectangular fissuring.

**Crown:** broadest near the top, dense, either open umbrella in form or billowing hemispheres.

**Bark:** finely fissured into small rectangles, fissures seldom dominantly vertical, dark brown.

**Bole:** persists above half the height of the tree, rugged, burred.

**Twigs:** diffused into the densest masses of any elm; a fuzz all over the tree, short-jointed, much twisted.

*Fig. 3:* A typically slender and hairy winter twig of English elm (life size).

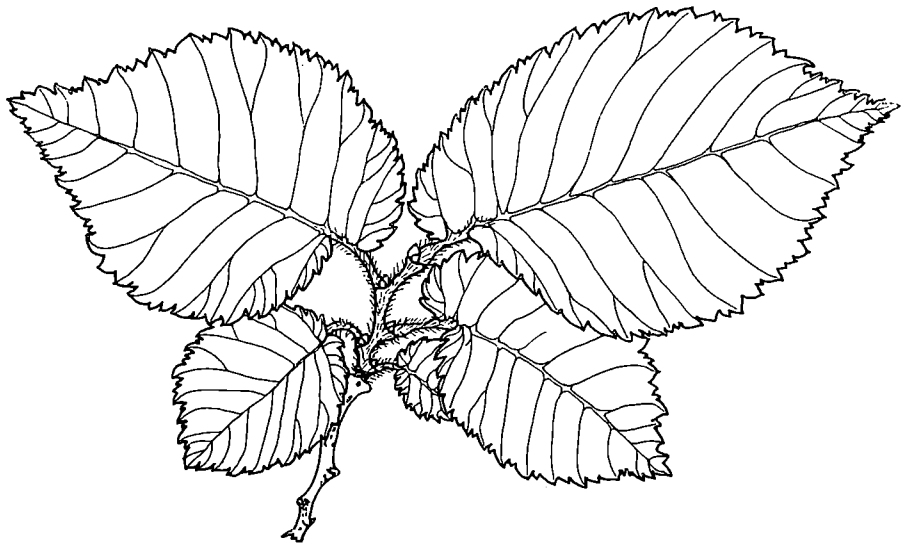

*Fig. 4:* Leafy twig of English elm (life size). The leaves are rounded with the under surface, petiole and young shoot densely hairy.

**Leaves:** nearly rounded to ovate, slightly cupped, thick and leathery. Upper surface dark green, rough, not hairy. Lower surface matt olive green, densely hairy and rough; obvious axillary tufts; mid-rib light green, veins not prominent.

**Petioles:** short, bright apple green, hairy.

**Shoots:** mainly brown with green tints, hairy.

**Buds:** ovoid, pointed, 2–3mm, dark brown, slightly hairy.

# Wych elm

Wych elm, *U. glabra*
Abundant in hilly, rocky country in west, Devon, Wales, Scotland, also in Yorkshire. Less common in south-east England.

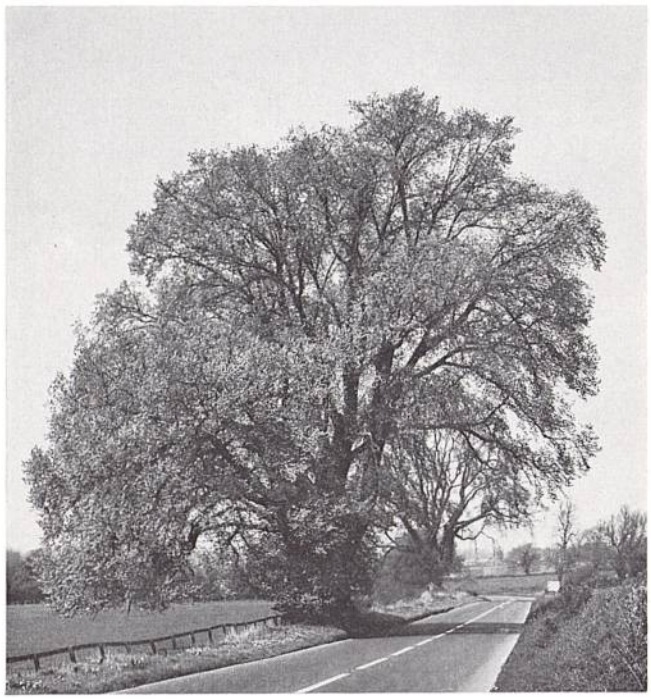

*Fig. 5:* A fine road-side Wych elm, Aldbourne, Wiltshire.

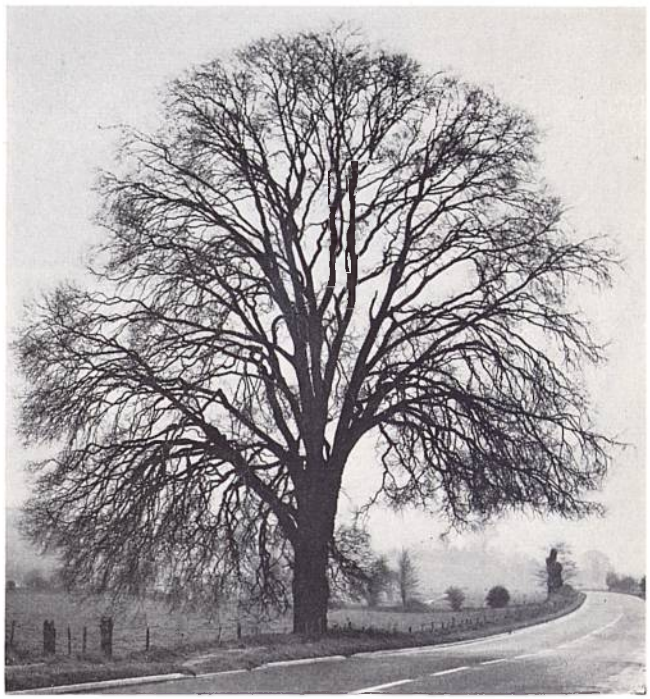

*Fig. 6:* Wych elm in winter showing the characteristic short bole, Hungerford, Berkshire.

*Fig. 7:* Bark of Wych elm.

**Crown:** a very broad irregular dome often asymmetrical.

**Bark:** heavily ridged with broad, deeply divided but smooth ridges, parallel particularly on big branches. Grey or brown.

**Bole:** usually short, with root-swell and buttressing to heavy branches.

**Twigs:** thick, widely angled, sparse and spreading horizontally even on pendulous branches.

*Fig. 8:* Winter twig of Wych elm (life size) showing the hairy, ovoid buds and stout shoots.

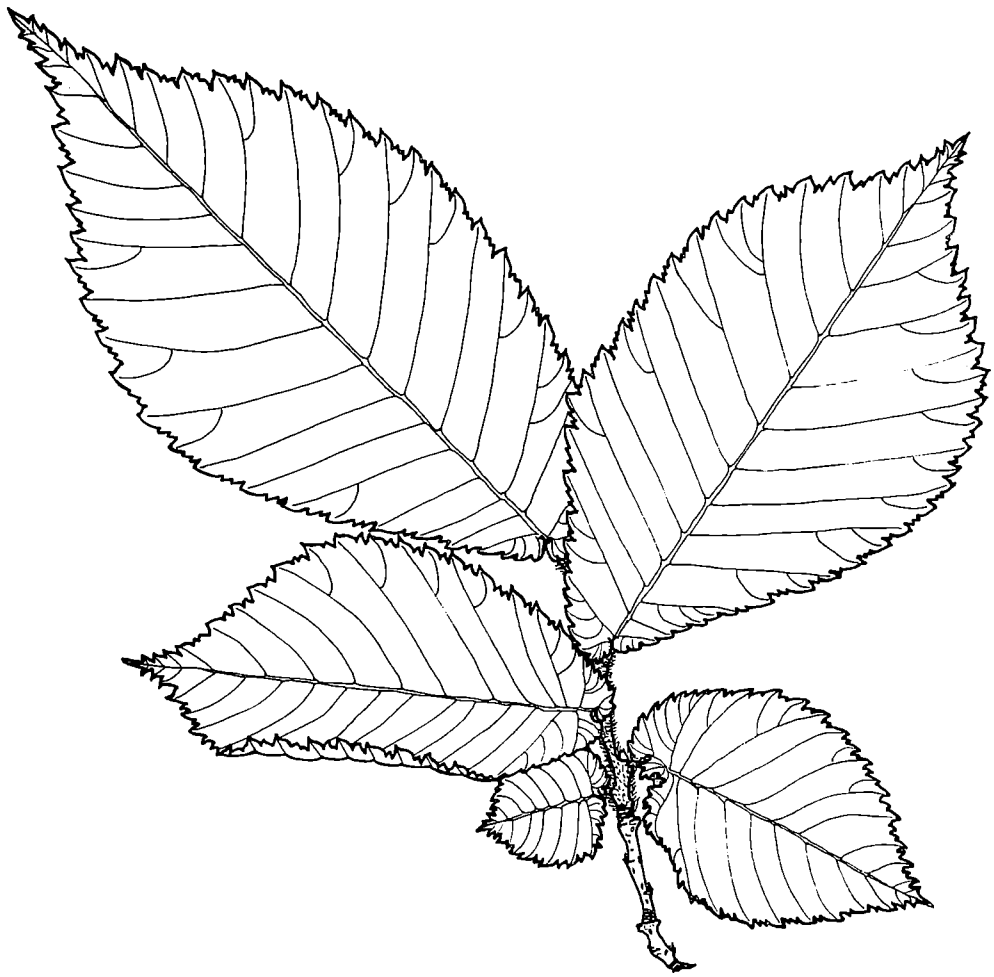

*Fig. 9:* Leafy twigs of Wych elm (life size). The base of the leaf blade nearly always covers the petiole.

**Leaves:** obovate to oblong-obovate, flat to slightly cupped, thick and leathery. Upper surface rough to very rough, dark green, matt to slightly shiny, not hairy. Lower surface matt olive green, hairy; axillary tufts not obvious; mid-rib light apple green, veins fairly prominent.

**Petioles:** very short, bright apple green, often covered by leaf blade.

**Shoots:** brown upper side, green under, stout and hairy.

**Buds:** ovoid and prominent, brown with reddish hairs.

# Smooth-leaved elm

Smooth-leaved elm, *U. carpinifolia* (var. *carpinifolia*)
Countryside elm in much of East Anglia and East Kent. Infrequent in rest of England; rare elsewhere.

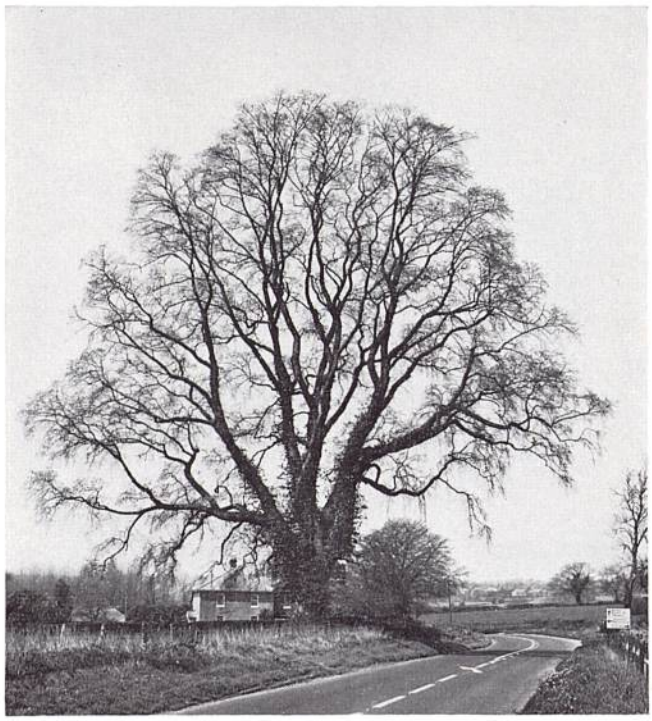

*Fig. 10:* Smooth-leaved elm, Aldbourne, Wiltshire. The pendulous branchlets shown here are a feature of the species.

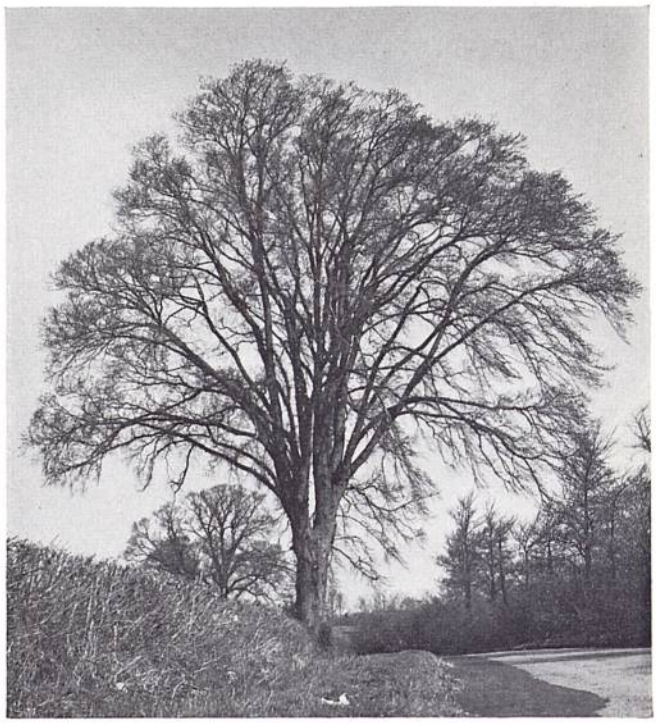

*Fig. 11:* Open-grown Smooth-leaved elm, Kettering, Northants. The tendency in this species for outer twigs to curl upwards is apparent in this tree.

*Fig. 12:* Bark of Smooth-leaved elm.

**Crown:** broadly cylindrical or slightly conic, with one or more domed tops, occasionally a massive broad dome.

**Bark:** fissured into vertical ridges, dull brown or dark grey; on younger branches rather smooth with fine black fissures, dull grey.

**Bole:** may be short or extend to above half the total height.

**Twigs:** the most slender of these elms, less densely bunched than in the English elm. Long slender branchlet systems often pendulous; ultimate twigs curled upward at the tips.

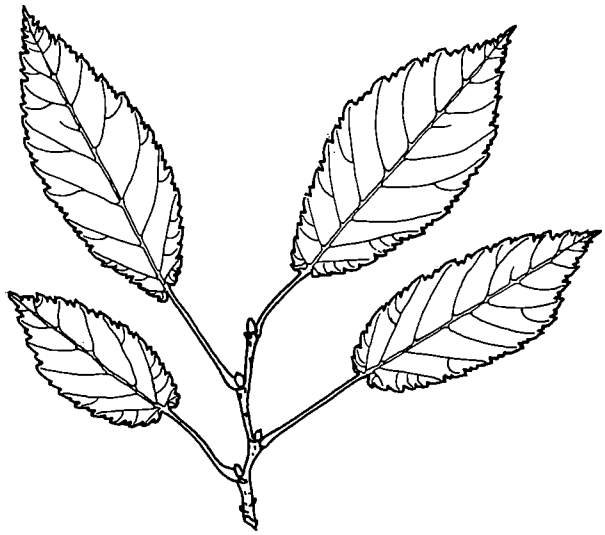

*Fig. 13:* The leaves of Smooth-leaved elm may be quite small as shown by this dwarf shoot (life size).

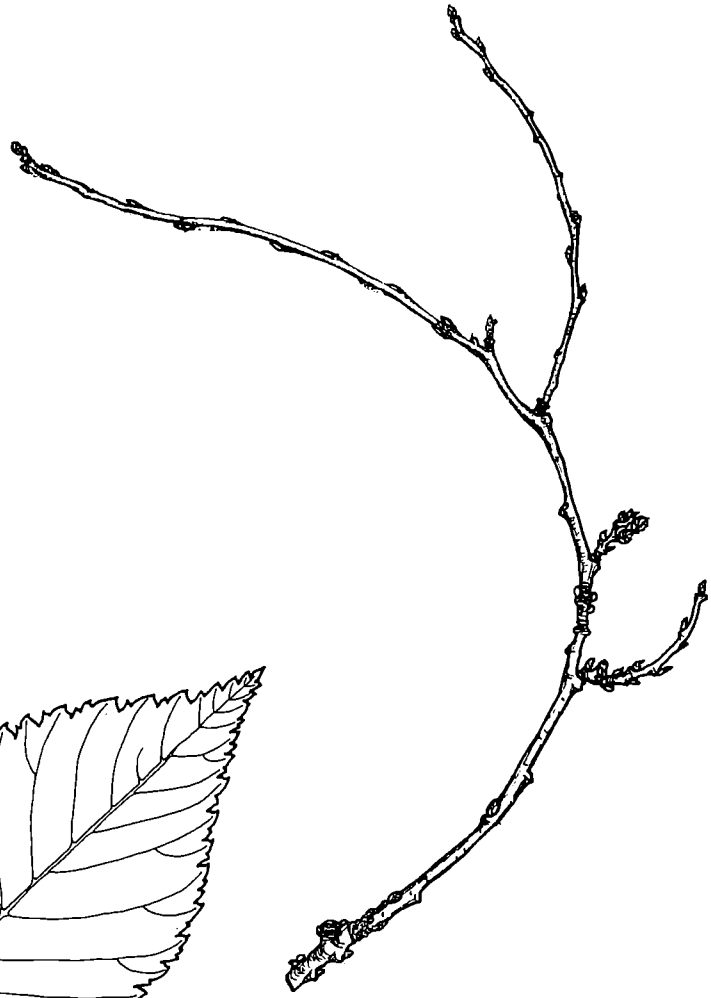

*Fig. 14:* Winter twig of Smooth-leaved elm (life size). The young twigs are usually slender and often curl near the tip.

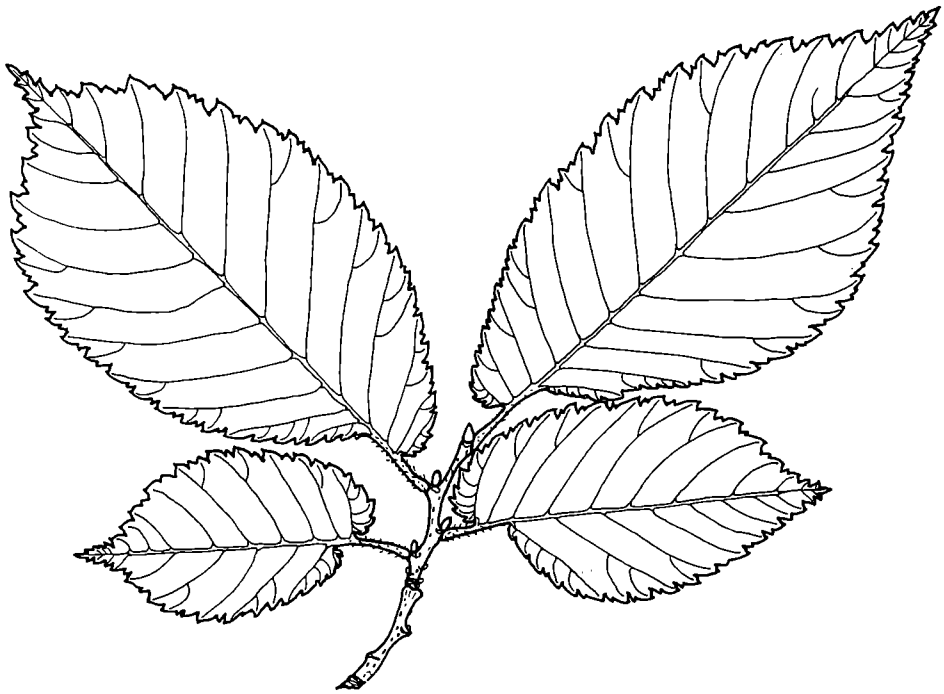

*Fig. 15:* Leafy twig of Smooth-leaved elm (life size). Such large leaved forms are common in eastern England.

**Leaves:** the most variable in size of any British elm; from lanceolate to almost round; flat to cupped. Upper surface medium to dark green, shiny, scarcely ever rough, and not hairy. Often waxy to touch. Lower surface matt olive green, smooth and without hairs; mid-rib light green, veins fairly prominent, axillary tufts insignificant.

**Petioles:** apple green, lightly hairy.

**Shoots:** apple green, without hairs.

**Buds:** large ovoid, shining dark red, hairy and pale at tip.

# Cornish elm

Cornish elm, *U. carpinifolia* var. *cornubiensis*

Abundant Cornwall, and Devon west of Bideford to Dartmoor. Frequent south of Dartmoor. Rare elsewhere: a few plantings in numbers – Devizes, Burbage (Wiltshire), Walsingham (Norfolk), Salisbury Cathedral, Regents Park, London.

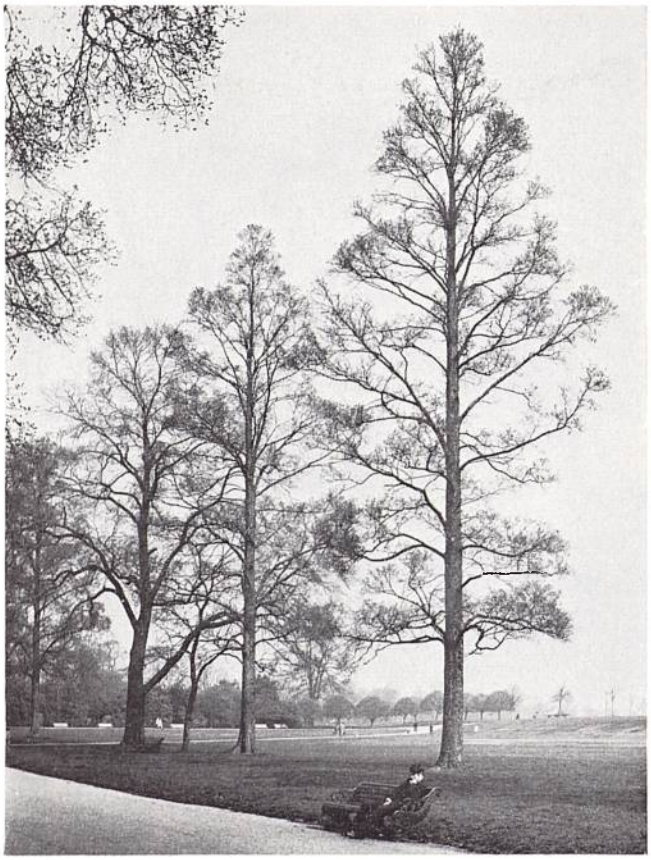

*Fig. 16:* Young Cornish elm, Kensington Gardens, London. The wide branching angle in the lower crown is characteristic of this tree in early life.

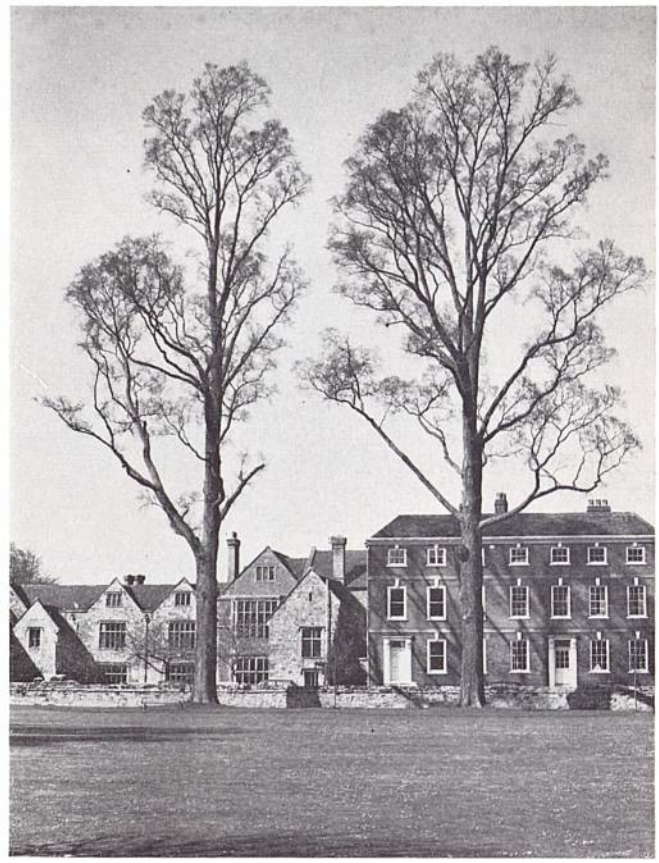

*Fig. 17:* Magnificent, open-grown Cornish elm in the Cathedral Close, Salisbury.

*Fig. 18:* The bark of Cornish elm may be grey or dark brown. Both types have close vertical fissuring.

**Crown:** when young columnar or conic with narrowly domed top and spreading lower branches, upper ascending; old trees fanning out at the top where branches arched; foliage crowded close on branches leaving large gaps between main branches without foliage – from a distance day-light shows between branches.

**Bark:** closely vertically fissured into narrow prominent ridges; pale, dull grey or dark brown.

**Bole:** persists to near the top (except in oldest trees), slender and straight.

**Twigs:** rather sparse in untidy, twisting systems.

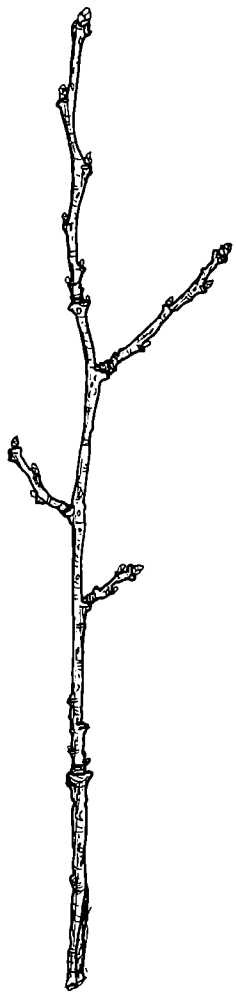

*Fig. 19:* Winter twig of Cornish elm (life size).

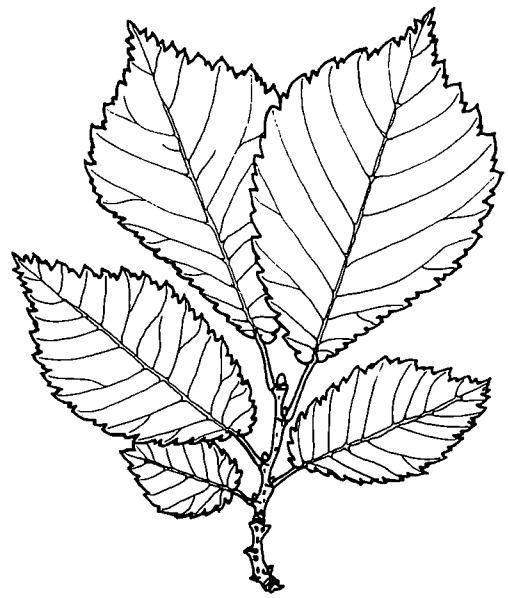

*Fig. 20:* Leafy twig of Cornish elm (life size). The leaves, which are always smooth and hairless often curve upwards from the mid-rib.

**Leaves:** ovate to obovate, flat to lightly cupped (smaller and narrower than on Wheatley elm). Upper surface smooth, shiny and waxy to the touch, no hairs, medium to dark green. Lower surface matt olive green, smooth and without hairs; mid-rib light green, veins fairly prominent, axillary tufts obvious.

**Petioles:** apple green, and rather hairy on upper surface.

**Shoots:** apple green without hairs.

# Wheatley elm

Wheatley elm, *U. carpinifolia* var. *sarniensis*
Much planted by roadsides, in avenues and parks in England, particularly in the Midlands. In Scotland confined to urban areas in east. (Introduced from Jersey in 1836).

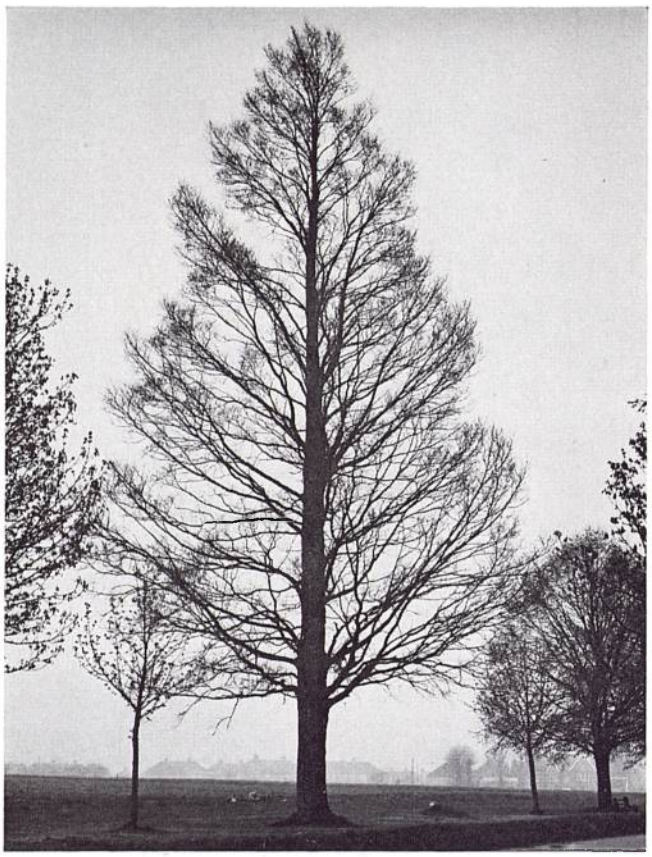

*Fig. 21:* Road-side Wheatley elm showing the characteristic conic crown and persistent central stem.

*Fig. 22:* Bark of Wheatley elm. The plate-like fissuring is similar to that of English elm though in later life the vertical fissuring in Wheatley elm tends to be stronger and deeper.

**Crown:** young trees rather narrow cone; older trees broader conic, less regular, major branches end in projecting vertical "turrets".

**Bark:** the most like English elm but deeper vertical fissures dominant, heavily ridged with age. Dark brown or pale grey.

**Bole:** persistent to the very tip.

**Twigs:** short jointed, much twisted.

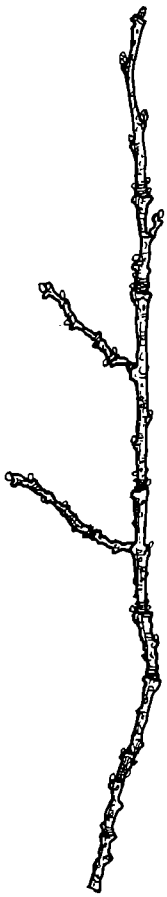

*Fig. 23:* Winter twig of Wheatley elm (life size).

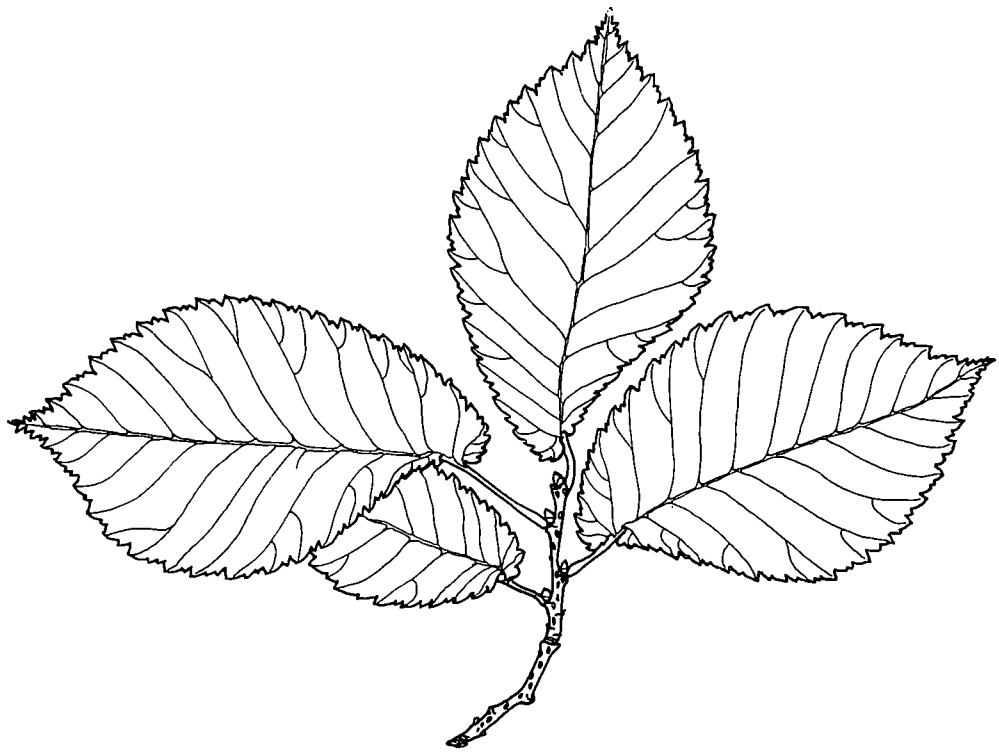

*Fig. 24:* Leafy twig of Wheatley elm (life size). Note that the leaves are usually longer and wider than those of Cornish elm.

**Leaves:** broad ovate, lightly cupped or folded along mid-rib. Upper surface smooth, shiny and waxy to the touch, no hairs, medium to dark green. Lower surface matt olive green, smooth and without hairs; mid-rib light apple green, veins fairly prominent, axillary tufts insignificant.

**Petioles:** apple green and hairy on upper surface.

**Shoots:** apple green without hairs.

# Dutch elm

Dutch elm, *U.* x *hollandica* 'Hollandica'
Locally frequent south west, central south and midland England. Scarce elsewhere; absent Surrey, east Sussex, Kent.

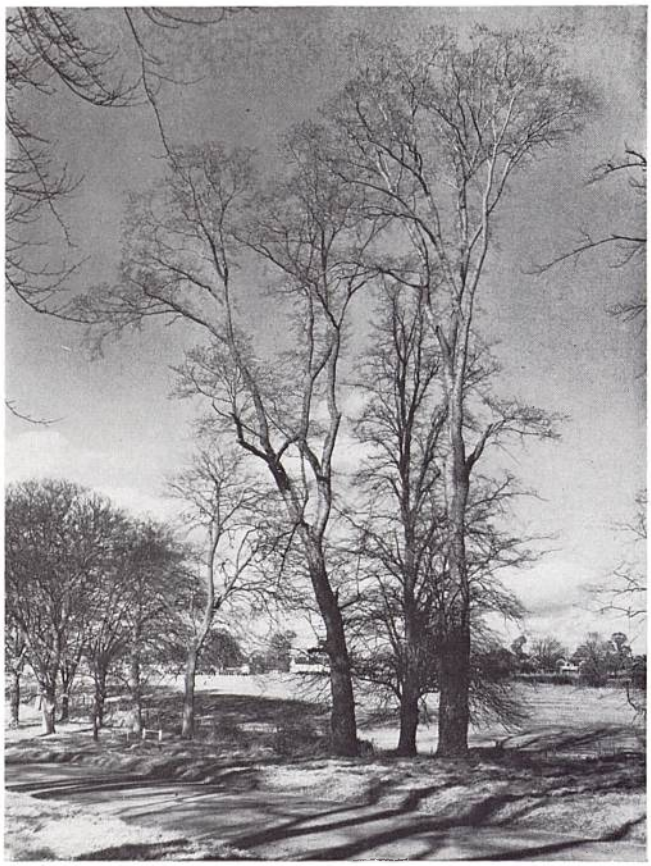

*Fig. 25:* Dutch elm in an avenue at Stowe, Buckingham. The sinuous branches of the left-hand specimen are typical.

*Fig. 26:* Bark of Dutch elm showing the shallow, scaly fissuring characteristic of this tree.

**Crown:** a sparse, open umbrella, often on a 'V' curving open at the top; wide domed. Very few smaller branches until high in the crown.

**Bark:** on oldest parts, in shallow, broad parallel ridges, especially under big branches, otherwise lightly crackled or flaked, with very shallow fissures; the smoothest elm bark: orange-brown or pale brown, but may be largely brownish grey.

**Bole:** may be short or persist well into the crown, always slightly, but noticeably sinuous.

**Twigs:** rather thick, sparsely branched.

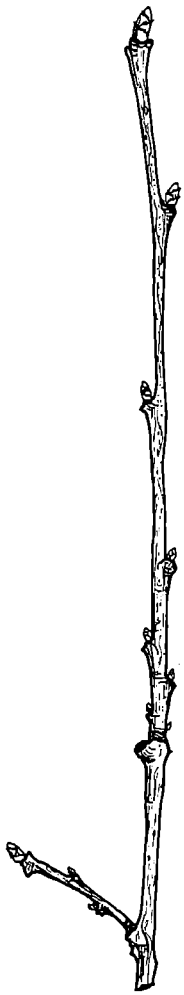

*Fig. 27:* Winter twig of Dutch elm (life size).

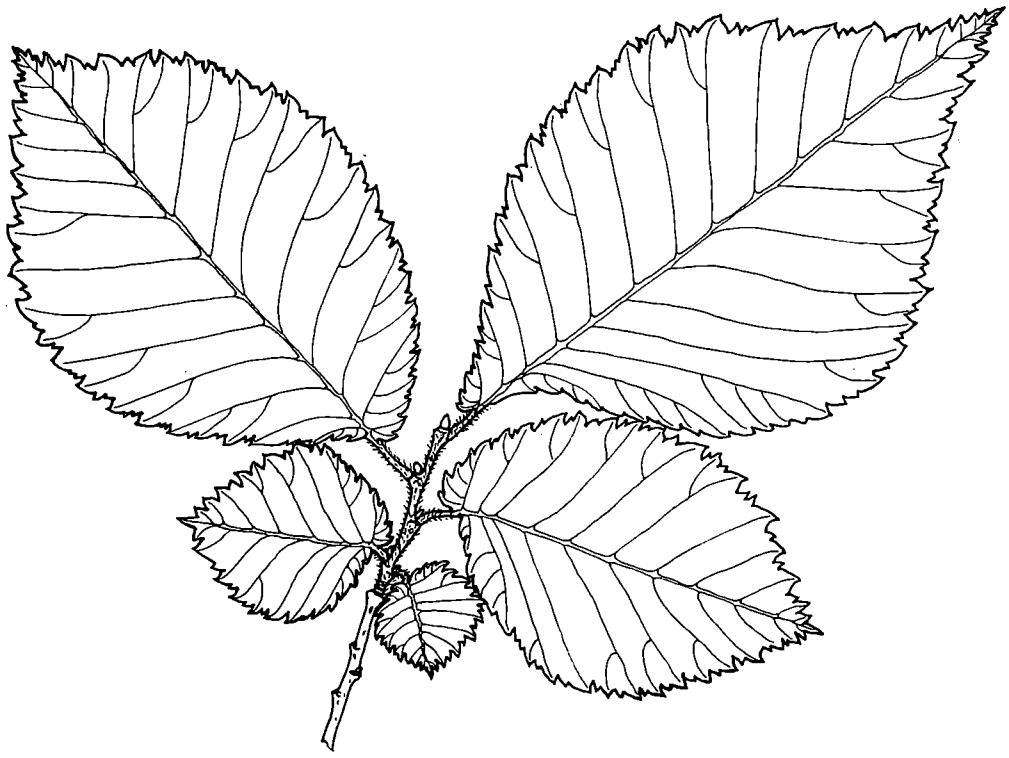

*Fig. 28:* Leafy twig of Dutch elm (life size) with typically oval shaped leaves.

**Leaves:** ovate, mostly flat, some buckled. Upper surface rough, dark green, slightly shiny, not hairy. Lower surface deep apple green, slightly rough due to hairs on veins; mid-rib light apple green, veins prominent, axillary tufts prominent.

**Petioles:** comparatively short, apple green, hairy.

**Shoots:** brown upper side, green under, hairy.

**Buds:** ovoid, shiny red-brown.

# Huntingdon elm

Huntingdon elm, *U.* x *hollandica* 'Vegeta'
Locally frequent roadside and avenue tree; also in parks.

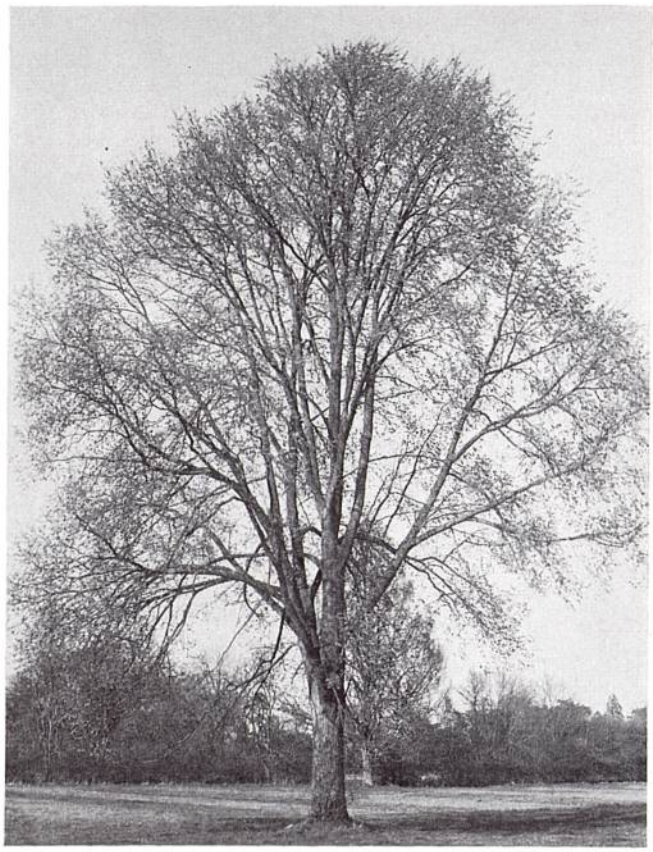

*Fig. 29:* An open-grown Huntingdon elm, Westonbirt Arboretum, Gloucestershire. The straight, strongly ascending branches are a feature.

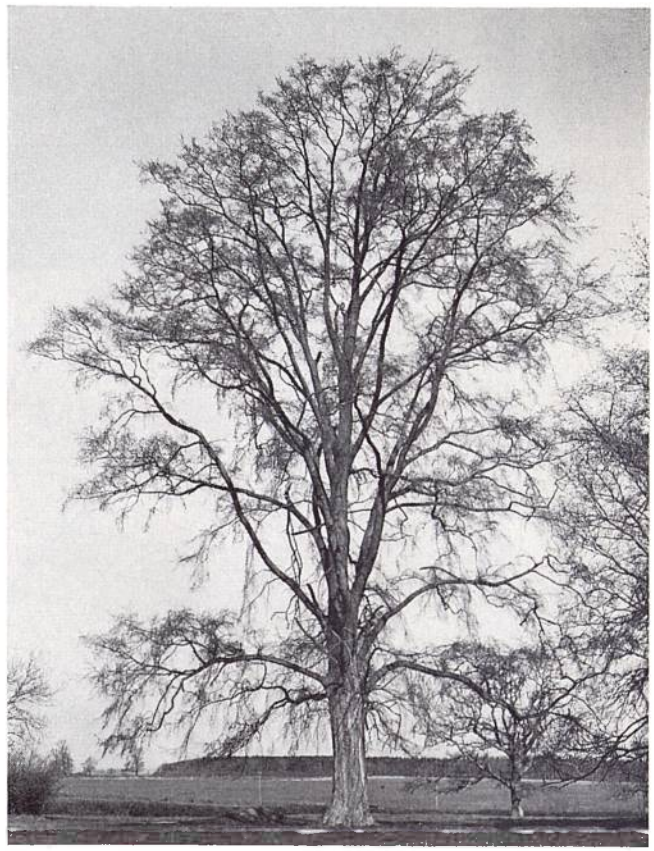

*Fig. 30:* A fine example of Huntingdon elm, Wellingborough, Northants. The semi-pendulous habit of the crown base is common to many open-grown specimens of this hybrid.

*Fig. 31:* Bark of Huntingdon elm. Left, the fissuring is dominantly vertical and parallel; right, the fissuring is heavily intertwined. Both types are common, the latter usually on older trees.

**Crown:** a tall dome; when young like a young lime tree except for the straight lower branches.

**Bark:** finely criss-crossed with deep fissures when young, becoming heavy intertwining ridges with age; more parallel and very marked on heavy branches. Dark brown when young, but with age pale grey or whitish grey with algae.

**Bole:** short, smooth and straight usually forking at the first or second whorl of branches.

**Twigs:** fairly stout.

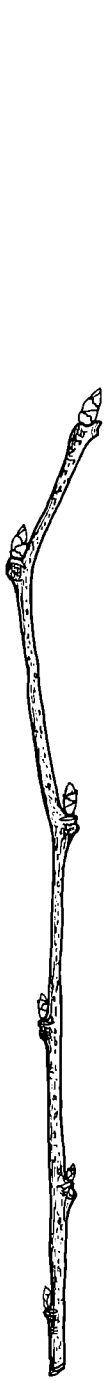

*Fig. 32:* Winter twig of Huntingdon elm (life size).

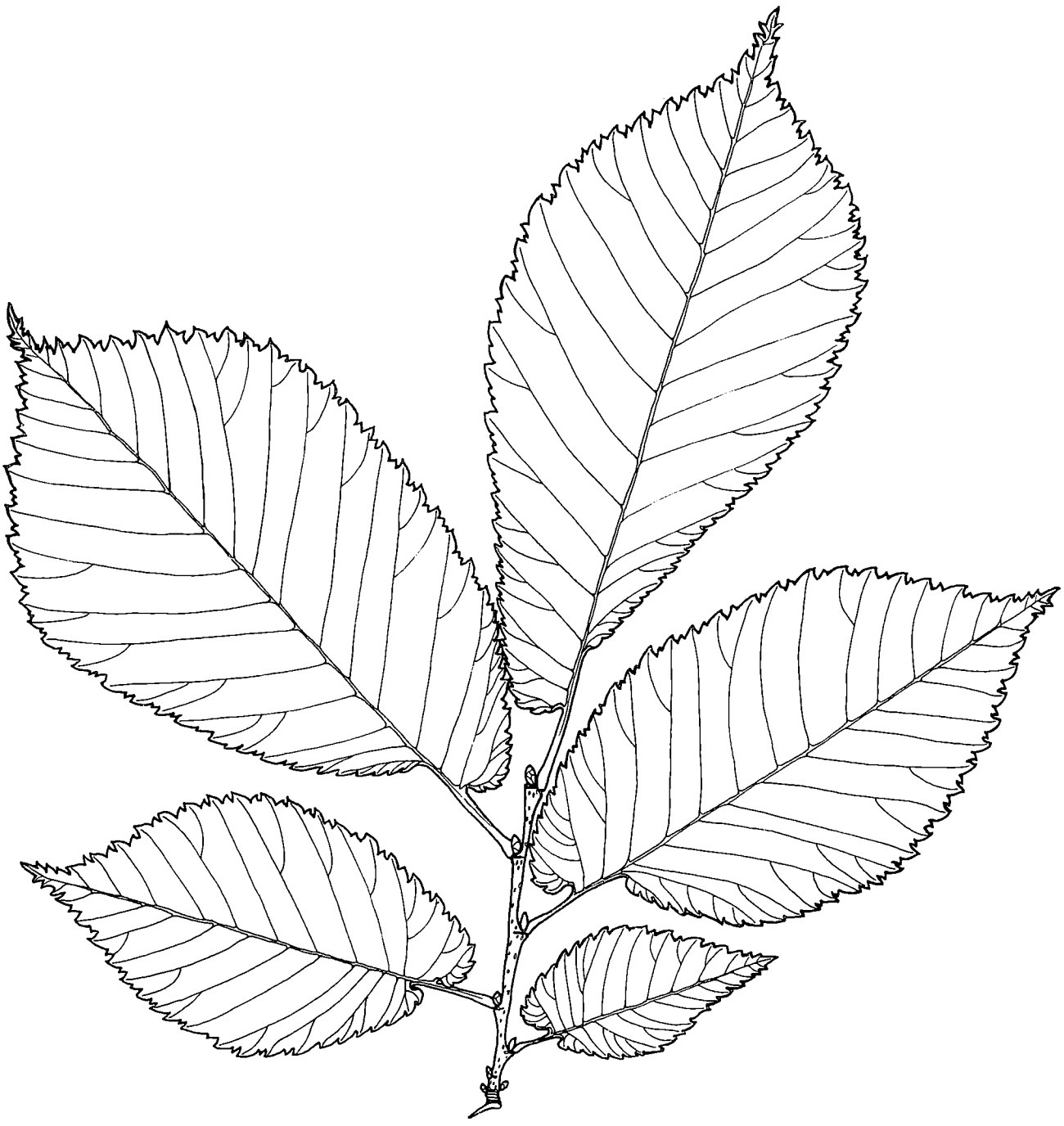

*Fig. 33:* Leafy twig of Huntingdon elm (life size). The leaves are bigger than are usually found on other British elms. At the leaf base note that the leaf margin starts from a vein and not from the mid-rib.

**Leaves:** ovate to ovate lanceolate, may be obovate; flattish blade. Upper surface deep apple green, rather shiny and waxy to touch, smooth; not hairy. Lower surface light olive green, smooth, without hairs; obvious axillary tufts; mid-rib yellow green, veins quite prominent.

**Petioles:** pale green to yellow, slightly hairy, relatively short.

**Shoots:** bright apple green, slightly hairy.

N.B. Leaf margin often arises from lowest veins rather than from mid-rib.

# Key to the Crowns of Mature Elms

| | | |
|---|---|---|
| **1.** | Conic; central axis persists to the tip; branches dense, mixed sizes, ascending. | **Wheatley** |
| | Fan-topped or domed; central axis failing well below apex. | *2* |
| **2.** | Top opening out as fan of arched branches with foliage close and dense along upper side; lower branches few, large, steeply ascending. | **Cornish** |
| | Domed. | *3* |
| **3.** | Open, shallow dome; few large strongly ascending branches sinuous, leaving sinuous bole at narrow angle; shoots stout; bark scaly. | **Dutch** |
| | Dense or fairly dense deep or multiple domes. | *4* |
| **4.** | Bole straight, branches on bole massive, not intermediate sizes; multiple domes; shoots dense, slender, short; bark small plates. | **English** |
| | Bole bearing branches of varied size. | *5* |
| **5.** | Branches radiating; lower branches strongly ascending with long, straight lower sector; symmetrical single dome; shoots stout. | **Huntingdon** |
| | Branches lacking straight lower sector; dome irregular or multiple. | *6* |
| **6.** | Shoots stout; branchiets short, perpendicular; bark broadly ridged. | **Wych** |
| | Shoots slender, often pendulous with tips upcurled; bark with narrow, long vertical ridges. | **Smooth-leaved** |

# Glossary

*Axillary tuft* – cluster of hairs in angle between secondary vein and mid-rib on lower leaf surface.

*Bole* – the main, unforked stem of a tree.

*Burr* – woody outgrowth on stem of tree.

*Columnar* – having the shape of a column.

*Conic* – having the shape of a cone.

*Lanceolate* – lance shaped, elliptical, narrow (about four times as long as wide), broadest about or just below the middle.

*Obovate* – egg shaped, broadest above the middle (outline).

*Oval* – egg shaped, broadest at the middle (outline).

*Ovate* – egg shaped, broadest towards the base (outline).

*Ovoid* – egg shaped (three dimensional).

*Pendulous* – hanging.

*Scaly* – (of bark) thrown off in patches.

*Sinuous* – (deeply) wavy.

*Whorl* – branches arranged in a circle around the stem.

# List of synonyms

**English elm**
Common small-leaved elm
Common elm
Small-leaved elm

*Ulmus procera* Salisbury

*U. sativa* Walker
*U. campestris* auct. incl. L.
*U. sativa* Miller
*U. suberosa* Smith
*U. surculosa* Stokes var. *latifolia* Stokes

**Wych elm**
Broad-leaved elm
Mountain elm
Scots elm

*Ulmus glabra* Hudson

*U. campestris* L., in part
*U. montana* Stokes
*U. scabra* Miller
*U. suberosa* Michaux

**Smooth-leaved elm**
Feathered elm
Smooth elm

*Ulmus carpinifolia* Gleditsch

*U. campestris* var. *glabra* Hartig
*U. campestris* var. *laevis* Spach
*U. foliacea* Gilibert
*U. glabra* Miller, not Hudson
*U. minor* Miller
*U. nitens* Moench
*U. surculosa* var. *glabra* Stokes

**Cornish elm**
*Ulmus carpinifolia* var. *cornubiensis* (Weston) Rehder

*U. angustifolia* (Weston) Weston var. *cornubiensis* (Weston) Melville
*U. campestris* L. var. *cornubiensis* Loudon
*U. campestris* var. *stricta* Aiton
*U. cornubiensis* Hort.
*U. glabra* f. *fastigiata* Dippel
*U. nitens stricta* Henry (also *U. nitens* var. *stricta*)
*U. reticulata* Dumortier
*U. sativa* (Evelyn)
*U. stricta* Lindley
*U. stricta* Lindley var. *cornubiensis* (Weston) Airy Shaw

**Wheatley elm**
Guernsey elm
Jersey elm

*Ulmus carpinifolia* var. *sarniensis* (Loudon) Rehder

*U. campestris monumentalis* Hort., not Rinz
*U. campestris* L. var, *sarniensis* Loudon
*U. campestris Wheatleyi* Simon-Louis
*U. glabra* Miller f. *sarniensis* Schneider
*U. nitens* var. *Wheatleyi* Henry
*U.* x *sarniensis* (Loudon) Melville
*U. sarniensis* Loddiges
*U. stricta* Lindley var. *Wheatleyi* Bean
*U. stricta* Lindley var. *sarniensis* (Loudon) Moss

**Dutch elm**
*Ulmus hollandica* Miller 'Hollandica'

*U. campestris* var. *major* Planchon
*U. fungosa* Aiton
*U.* x *hollandica* Miller
*U.* x *hollandica* Miller var. *major* (Smith) Rehder
*U. hollandica major* (Smith) Rehder
*U. major* Smith
*U. scabra* Miller var. *major* Guerke (or Gürke)

**Huntingdon elm**
Chichester elm

*Ulmus* x *hollandica* Miller 'Vegeta'

*U. americana* Masters W.
*U. glabra* Miller var. *vegeta* Loudon
*U.* x *hollandica* Miller
*U. Huntingdoni* Hort.
*U. vegeta* Lindley

Additionally the following names have been given to variants of Smooth-leaved elm in east England:

**Plot's elm**
Plot elm

*Ulmus carpinifolia* var. *plotii* (Druce) Tutin

*U. minor* Henry, not Miller
*U. plotii* Druce
*U. sativa* Moss, not Miller
*U. surculosa* var. *angustifolia* Stokes

**Small-leaved elm**
Lock elm
East-Anglian elm

*Ulmus diversifolia* Melville

*U. angustifolia* (Weston) Weston var. *angustifolia* Melville
*U. campestris* Smith
*U. glabra* Miller var. *minor* Ley
*U. minor* Miller
*U. plotii* Druce
*U. sativa* Moss
*U. sativa* Miller var. *Lockii* Druce

**Coritanian elm**

*U. coritana* Melville

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# References

CLAPHAM, A. R., TUTIN, T. G. and WARBURG, E. F. (1962) *Flora of the British Isles* (2nd edition) Cambridge University Press, 562–566.

MITCHELL, A. F. (1967) A quick way to recognise the elms of England *Supplement to Timber Trades Journal* 8 April, 1967, 20–21.

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