WINTER TWIGS

By Lizzie Maddison

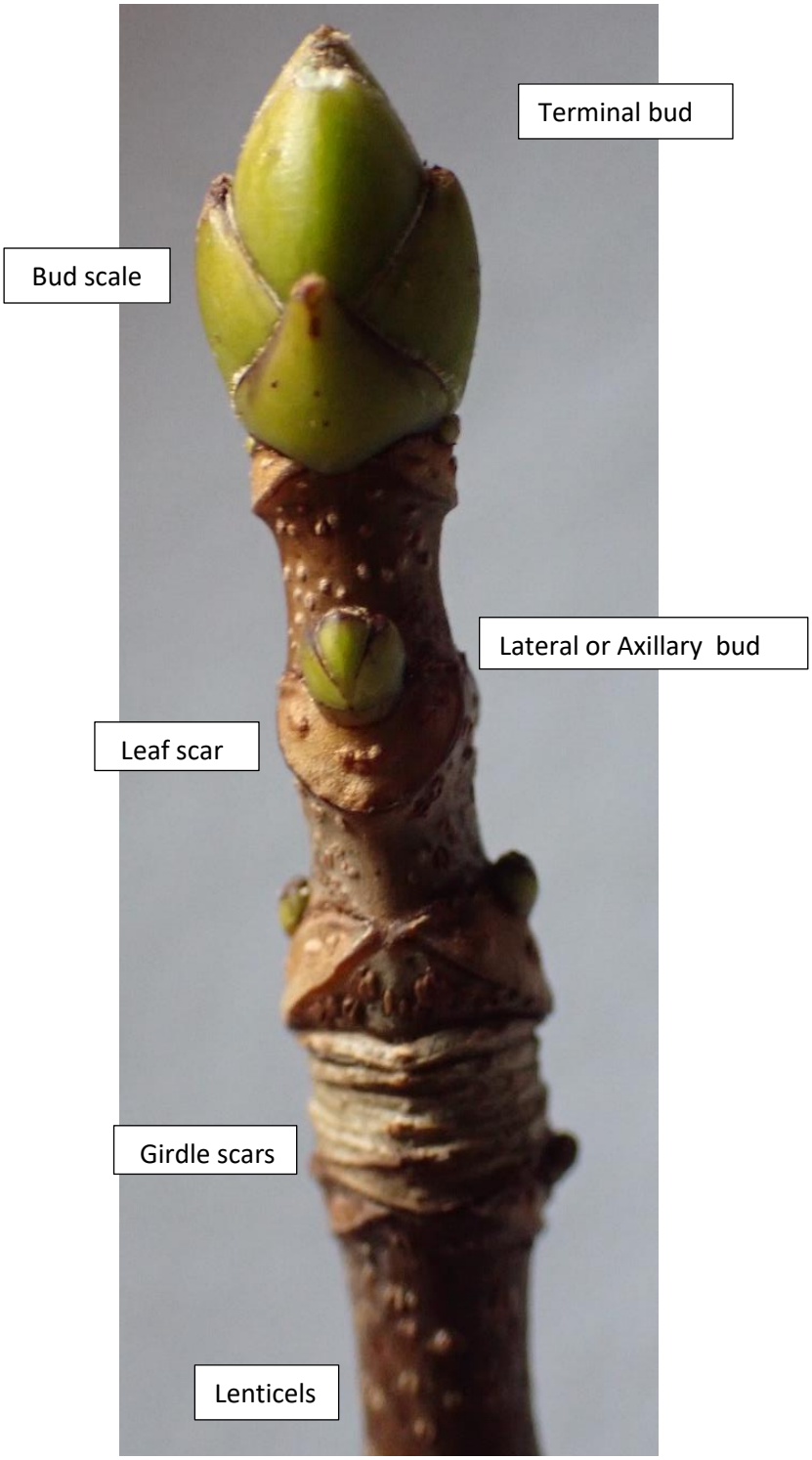
(Photographs: Bob Maddison)

At the onset of Winter, the deciduous trees are bare of leaves and battened down for the long dark days ahead. The trees and shrubs remain in this dormant state until the increasing warmth of Spring triggers growth.

Winter twigs have features in common but there are also distinct variations in the structures which are very useful for identification.

Structure of the Winter Twig

Main Components



Types of bud

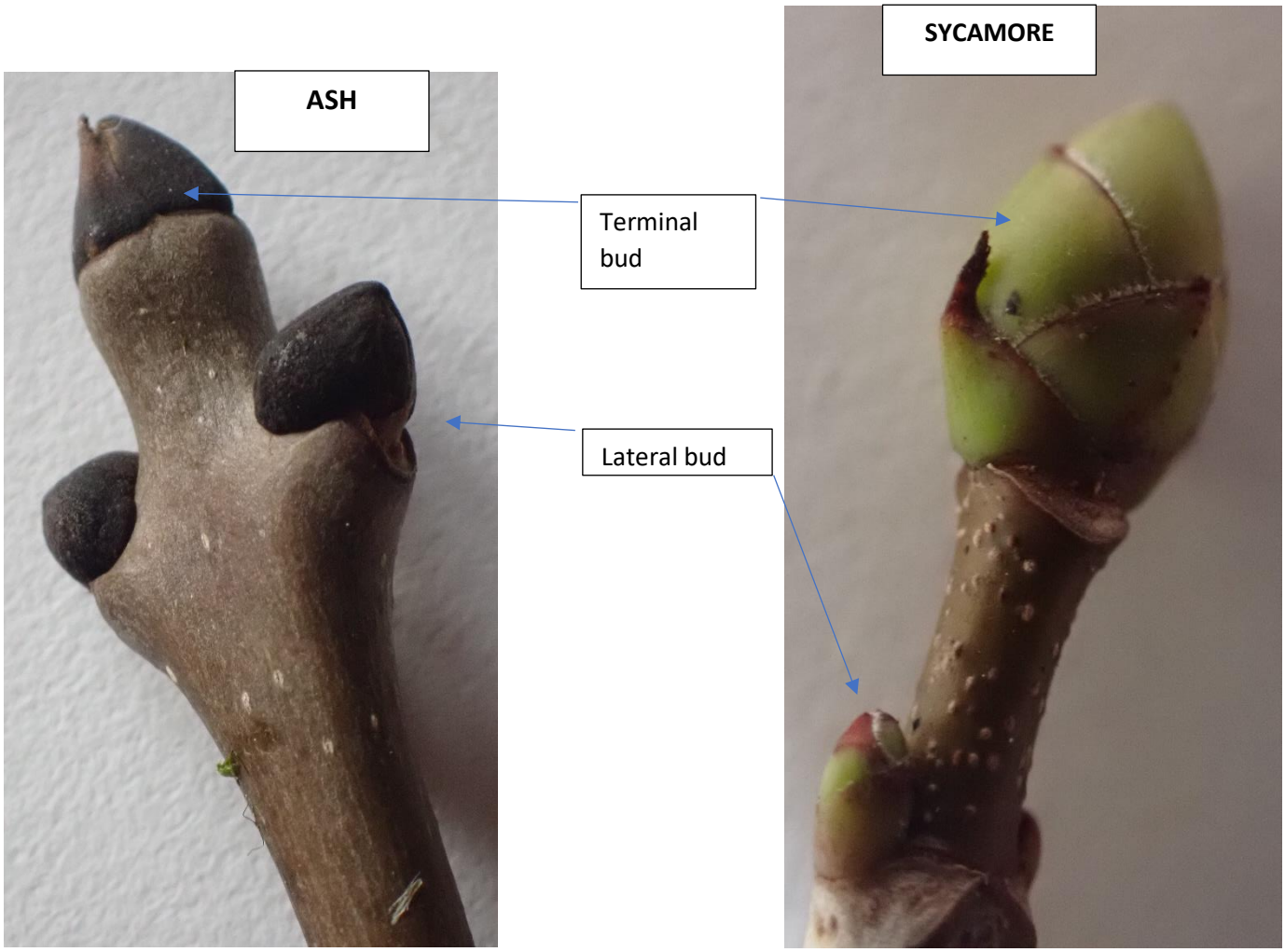
Winter buds are condensed shoots. The stem of the shoot is very short and the overlapping leaves are tightly packed into the small space of the bud. The outer bud leaves are modified into tough scales which offer protection from desiccation, bird and insect damage and from fungal infections.

Twigs normally have 2 main types of bud.

1. **Terminal buds** which form at the tips of the branches.
   The terminal bud is the dominant or main bud and is responsible for growth at the beginning of spring and increasing length in the branch.
   The terminal bud releases a hormone which supresses growth of the lateral buds. If it is snapped off, the lateral buds will produce side shoots.

2. **Lateral buds** found in the axils of the leaves and known as axillary or lateral buds.
   The lateral buds make new branches.

   Both types of bud can produce flowering shoots under specific conditions.
   Winter bud formation enables the deciduous tree, with leaves already formed in the bud, to begin photosynthesise early on in at the onset of Spring.



Terminal bud of Beech

Notice long pointed bud with long overlapping scales

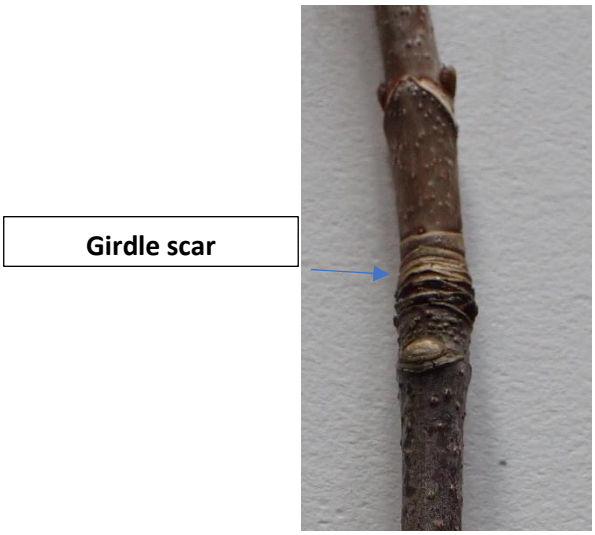
Lateral buds of Alder

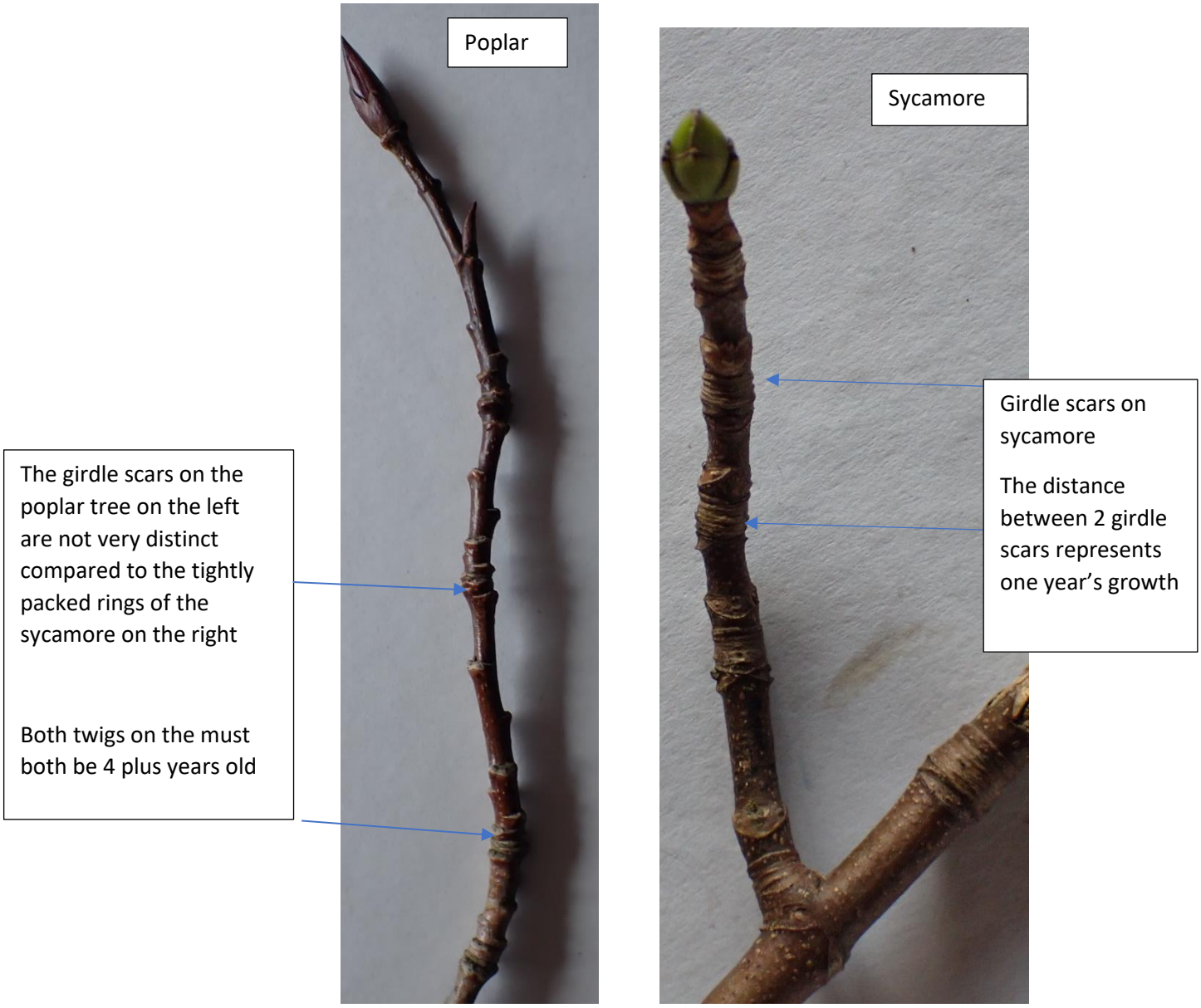
Observe the ‘boxing - glove’ single bud scales on the lateral buds

Girdle Scars

The bud scales on the terminal bud, unlike the foliage leaves, are not spaced out on the stem, and when they fall off they leave narrow scars which are packed close together and extend part way around the stem. These narrow bands of rings are called **girdle scars**.

If you look further down the branch, you may see another girdle scar formed from the previous year, the distance between the two girdle scars will representing one year's growth.





Leaf Scars

Leaf scars form where the leaf was attached to the stem. In the summer each leaf has an axillary bud in its axil. In the winter twig, this bud is still evident above the leaf scar.

Leaf scars are a characteristic shape for each species of tree.

Look closely at the leaf scar and you will see tiny markings where, earlier in the year, the transport vessels [vascular bundles] carried water from stem to leaf, and nutrients from leaf to stem.

At leaf fall, the vessels are blocked with a corky material which seals off the openings , preventing water loss and infection.

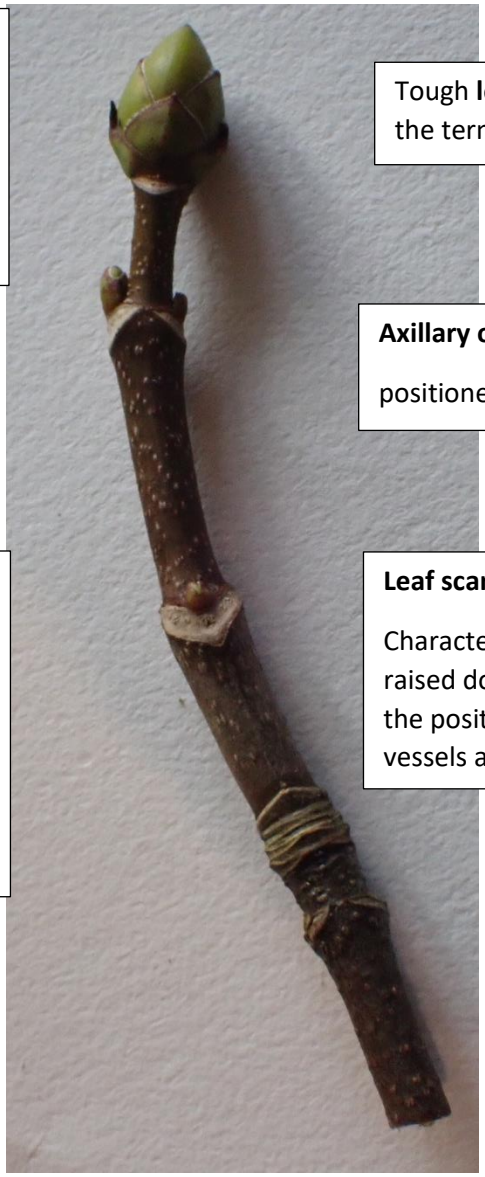
Leaf scar sycamore

Leaf scar alder

Summary of Structure of a Winter Twig

Terminal bud

Formed at the ends of main shoots and branches. They are condensed shoots containing the tightly packed foliage leaves needed for the coming Spring.



Tough **leaf scales** protect the terminal bud

Axillary or lateral bud

positioned above the leaf scar

Girdle scars

The bud scales on the terminal bud are tightly packed and leave narrow scars when they fall off.

The length of stem between each set of girdle scars represents one year's growth.

Leaf scars

Characteristic for the species. The tiny raised dots within the scar showing the position of the blocked xylem vessels after leaf fall

Lenticels

Arrangement of lateral buds on Winter twigs

The lateral buds can be arranged in several ways along the branch. Remember the lateral buds are found at the base of the leaf stalk or petiole when the leaves are present on the trees.

1. **Opposite. Leaves grow opposite each other along the branch**

2. Leaves grow **alternately** or **spirally** along the branch

Lenticels

The lenticel is used for gaseous exchange to support respiration in trees and woody plants. The outer protective bark on the tree is impervious to gases. Lenticels are pore-like openings which provided a direct route into the outer tissues of the tree . They enable entry of oxygen into the tissues in one direction and outward movement carbon dioxide in the other direction

The tissue behind the lenticel contain large airspaces to store gases and facilitate effective gaseous exchange. They vary in shape and size and can help in identification of a tree species.

Some interesting features to look out for in the woodland at the moment

Reproduction in Hazel

Female hazel flower

Look out for these tiny red flowers on the hazel

Male catkin flowers in hazel

The male flowers are arranged in catkins which dangle down from the branch

Lichens growing on the winter twigs

Bracket Fungus growing on dead tree trunk