

DEFECTS.—The defects in timber may be classified according to (a) those developed during its growth, and (b) those occurring after it has been felled. Those which appear during the growth of the tree include Deadwood, Druxiness, Foxiness, Coarse Grain, Twisted Grain, Cup Shakes, Heart Shakes, Upsets and Knots. Defects which develop or are produced after the timber has been felled are Doatiness, Dry Rot, Wet Rot, Shrinking, Swelling, Warp, Wane, Chipped Grain and Chip Mark.

The following is a brief description of these defects, some of them being illustrated in Fig. 31 :—

*Deadwood*.—Applied to redwood which is deficient in strength and weight and having an abnormal pinkish colour ; is the result of trees being felled after they have reached maturity.

*Druxiness* is an incipient (early) decay which appears as whitish spots or streaks ; is due to fungi (a form of plant life) gaining access, probably through a broken branch, and setting up decay.

*Foxiness*.—Reddish or yellowish brown stains in oak caused by over-maturity or badly ventilated storage during shipment ; is an early sign of decay.

*Coarse Grain* timber has very wide annual rings caused by the tree growing too rapidly ; wood is deficient in strength and not durable.

*Twisted Grain or Fibre* (see D).—Fibres are twisted to such an extent that a relatively large number are cut through when the log is converted into planks, etc. ; such planks or boards will twist or warp ; caused by wind action in branches twisting the tree trunk.

*Cup Shakes or Ring Shakes* (see A).—Cracks or clefts developed between two adjacent annual rings ; interfere with conversion of timber, resulting in waste ; caused by sap freezing during its ascent in tree during spring.

*Heart Shakes* (see B).—Shakes which begin at the heart or pith of the log ; a single cleft is not serious. A *Star Shake* consists of several heart shakes somewhat in the form of a star ; render conversion of timber difficult and uneconomical. They are an early sign of decay and are caused by shrinkage in an over mature tree.

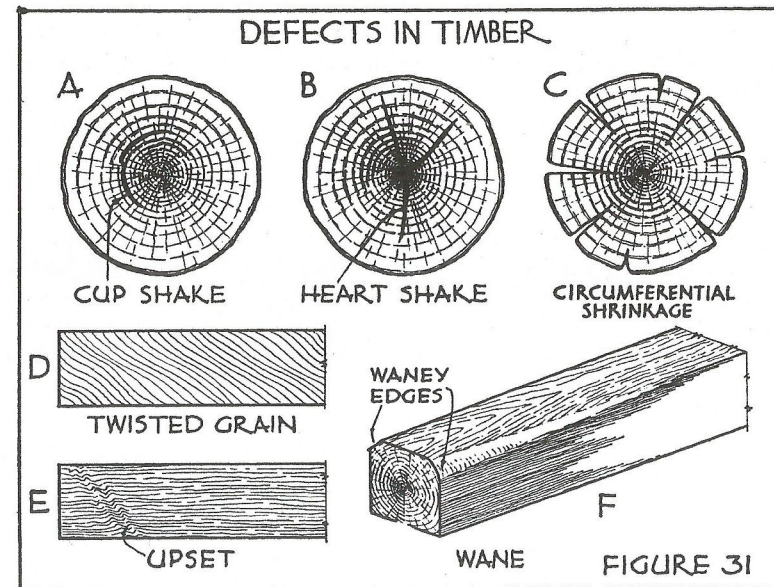
*Upsets or Rupture* (see E).—Fibres deformed due to injury by crushing during the growth of the tree.

*Knots* are sections of branches present on the surface of wood in the form of hard dark pieces. It is almost impossible to obtain certain converted timbers entirely " free from knots " (as is sometimes specified). Those known as " tight knots " are sound (being securely joined to the surrounding wood) and are not objectionable unless large. Wood with " large " or " loose " knots should not be used as they are unsightly and readily removed ; wood containing many knots is difficult to work. Knots are a source of weakness if present in timber to be used as struts or similar members.

*Dote or Doatiness*.—Form of incipient decay indicated by patches of greyish stains speckled with black which are relatively soft ; due to imperfect seasoning or badly ventilated storage and found in American oak, beech and birch.

*Dry Rot*.—Decay caused by fungus which feeds upon the wood and reduces it to a dry and powdery condition. It may appear as masses resembling cotton-wool with grey or brown coloured strands which branch out in network formation to adjacent timber. Badly affected timber has little or no strength and readily crumbles by pressure of the fingers. Timber containing an *excess of sap* and in *badly ventilated positions* is readily affected (see pp. 61 and 76). Diseased or suspected timber must be removed at once.<sup>1</sup>

*Wet Rot* is a chemical and not a fungoid decay of timber ; affected portions are reduced to a greyish brown powder and these only need to be removed and



replaced ; caused by timber being subjected to alternating wet and dry conditions.

*Shrinking and Swelling*.—When the amount of moisture in timber is reduced during seasoning the wood shrinks (contracts), and if wood absorbs additional moisture after seasoning an increase in volume (swelling) results. The extent of this movement is referred to on p. 57 and is influenced by the manner of conversion, moisture content and proportion of heartwood.

*Circumferential Shrinkage* (see c).—Defect denoted by clefts which radiate from the circumference of the log towards the centre ; clefts decrease in width from the outside and are usually limited to the sapwood ; result of shrinkage which occurs during seasoning.

*Warp* is distortion or twisting out of shape which may occur during shrinkage ; in one form (when it is called *bow* or *bowing*) the plank or board is slightly curved

<sup>1</sup> The detection and cure of dry rot are described on pp. 15 and 16, Vol. III.