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FORESTS DEPARTMENT
PRODUCTION
PROTECTION
RECREATION
CONSERVATION
WESTERN AUSTRALIA

Logging Series
No. 1—FELLING METHODS

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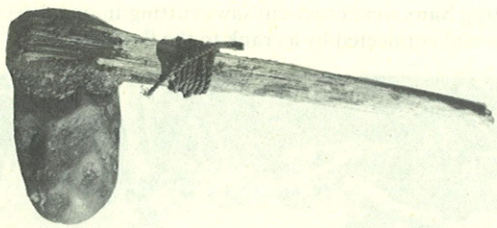
In no other part of the logging operation have the changes from man to machine been so extensive, as in that of tree felling.

There is documentary evidence that primitive man discovered the use of fire while still in the cave, and presumably he fuelled his fire by breaking branches and twigs with his bare hands.

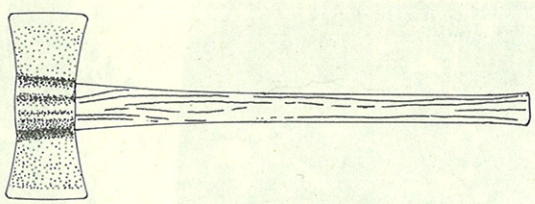
Stone age man developed the first primitive knives and stone axes that were used, not only to kill and prepare food, but also to cut down trees for use in his home and for fuel. The stone age axe looked something like this:



Stone Age axe

This implement had many transitions during the bronze and iron ages, and the "modern" steel axe is thought to have evolved in about the first century A. D. There have been many changes in shape and size but some of the commonest types of axe are:

The **North American Two-bladed** (double-bitted) **Axe.**



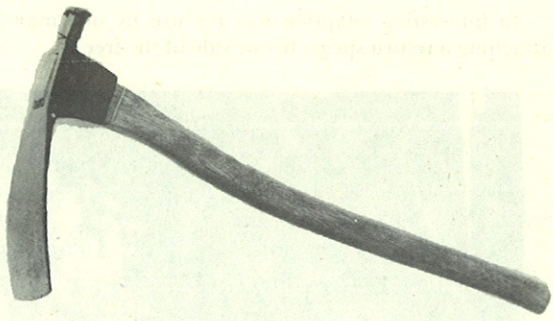
Double-bitted axe

The English and Australian axe (often called a **"Kelly"** from the trade name of an early racing axe) has become a standard for tomahawks, light pruning axes and tree-felling axes. They range in weight from ·5 to 3 kilograms.

In the early days of tree felling in Western Australia, right from the time when Mrs. Dance chopped down a tree in Barrack Street, all trees were cut with an axe of this type, but two other specialised "axes" were also widely used.

Australian axe

The **Adze** is a tool similar in appearance to a mattock and was used to smooth the surface of split posts and rails and to shape the ends of rails in post and rail fencing.

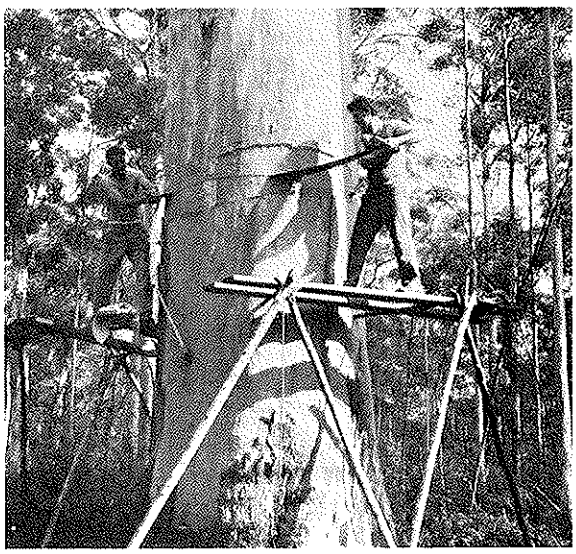


Adze

The **Broad Axe** is still used occasionally for preparing bridge decking, corbels, etc., but in the early days was the main tool in the "hewing" of railway sleepers. There were left-hand and right-hand broad axes with one flat surface and one angled for sharpening.

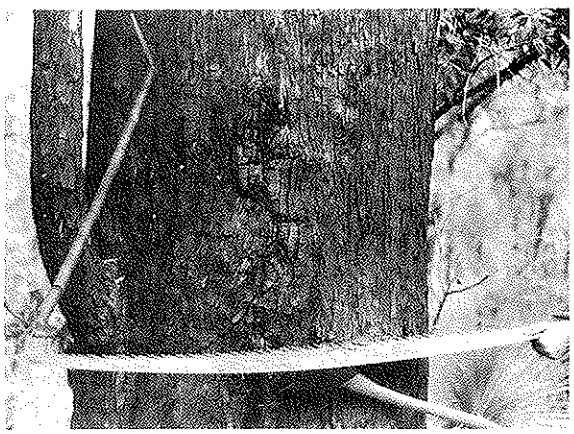
Broad axe

With the advent of high quality steel that could be produced as a thin, sheet material came the **Cross-cut Saw.** There were many styles and tooth shapes but by far the commonest cross-cut used in Australia was the "peg and raker" saw. The peg and raker has large coarse cutting teeth alternating with flat "rakers" to remove the sawdust, and was generally used as a two-man saw.



Cross-cut saw

An interesting adaption was for use by one man by attaching a return spring to one side of the tree.



Cross-cut saw with spring

For smaller trees and for softwoods a Scandinavian innovation had a long period of popularity. This was the **Bow Saw** or **Bushman Saw,** of which there are many variations.

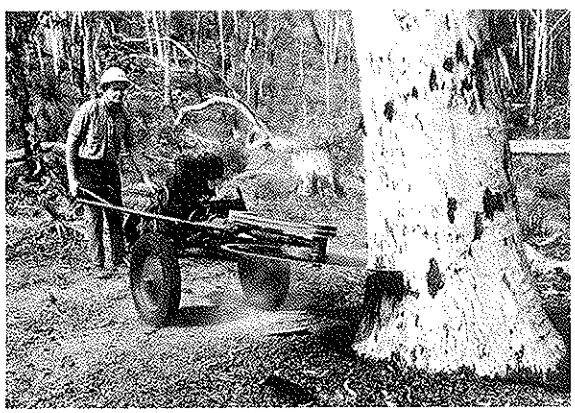
Bow saw

These saws were manually tensioned by turnbuckles or levers and had light, flexible, disposable blades. They could be used by two men but were usually one man tools.

The development of portable two-stroke motors for motorcycles paved the way for mobile power saws. The first of these were known as power saws or **Swing Saws** mounted on two (occasionally one) wheels and fitted with either circular or cross-cut saw blades. In principle they were similar to a large wheel-barrow but with a central axle taking the dead-weight of the motor. Some were pushed from tree to tree by sheer brute strength but many had a belt- or chain-drive to the wheels. The best-known powered circular saw in Western Australia was the **Blue Dennis,** manufactured by Dennis Brothers of Maylands and using the once famous J.A.P. motorcycle engine, either single- or twin-cylinder versions.

Drag Saws were cross-cut saws cutting in one direction only, and connected by a crank to the fly-wheel.

Mobile drag saw



Mobile circular saw

In the late 1940s a new type of saw, that was to revolutionise tree felling and log preparation became available on the Australian market. This was the **Chain Saw.** Like the power circular saws, they were powered by two-stroke motorcycle engines and the first models were two-man saws about 2 metres long and very heavy. The Teles, Blue Streak and Danarm saws were used for about seven years until the first of the American one-man saws

Two-man chain saw

One-man chain saw

arrived in Australia in about 1956. These were still very heavy by modern standards but had specially designed motors and another great innovation—the Chipper Chain.

The earlier "scratch" chain was inefficient, very heavy and extremely difficult to maintain. By contrast the chipper chain had a narrower gauge, less teeth (and

Tree harvester

hence more power per tooth) and was easily sharpened in the bush with a series of round files. Through the '50s to the '70s, these saws have been progressively modified, fitted with noise and vibration suppressors, and decreased in weight.

In the '50s, one-man chain saws weighed about 23 kilograms, whereas the latest comparable models in 1978 weigh 12 kilograms, with lighter versions for softwood felling weighing 10 kilograms and pruning versions 4 kilograms. Small "garden variety" chainsaws not used for forest work may be even lighter.

Shears—Secateurs. In high yield forests, particularly for softwoods, many operations in the northern hemisphere have turned to a machine-mounted felling device. It is usually known as a **Log Shear,** and is in effect, a massive secateur mounted on a heavy tractor, that simply clips off the tree near its base.

Shears are not yet very common in Australia, partly because they work best in a conifer clear-felling operation—a treatment not yet commonplace here. There are, however, a few logging machines at work in south-eastern Australia using a shear to lop the top of pines, then cut the base and load the whole tree on to the back of the machine. Capital costs are high but such machines can offset high labour costs wherever the yield and terrain are favourable.

In Western Australia several tree harvester machines are being used in pine forests. This machine cuts the tree, then delimbs and debarks it before lopping off the top at a predetermined diameter and stacking the logs to one side. The machine will handle over 100 trees an hour in suitable conditions.