

consist of the same substance and one species differs from another chiefly by the way this is arranged in the wood structure. Since all woods *do* consist chiefly of the one substance, the Calorific Values of all of them must be the same. Measurements of the Calorific Value show that 1 pound of *perfectly dry* wood yields 8,220 B.T.U. For comparison it may be stated that 1 pound of good hard coal yields about 12,000 to 13,000 B.T.U. and poor coals go very much lower. Perhaps it would be better to compare these in terms of cords and tons. One cord of air dried maple or birch will contain about 3,250 lbs. of dry wood and about 720 lbs. of moisture. Its heating value will then be

$3,250 \times 8,220 = 26,715,000$  B.T.U.  
less  $1,220 \times 720 = 878,400$  B.T.U.  
giving a net heating value of 25,836,600 B.T.U.

A ton of coal gives a net heating value of

$2,000 \times 13,000 = 26,000,000$  B.T.U.  
These two values are very nearly equal so that we can say that *one cord of well dried hardwood (beech, birch or maple) is equal to one ton of good hard coal*. Other woods have heating values in proportion to their weight per cubic foot.

#### A Guide to Values

The following table shows the number of cords of various common woods required to equal 1 cord of well dried hardwood or 1 ton of coal.

Ash.....	1. 10 cords.
Basswood.....	1. 70 "
Beech.....	1. 00 "
Birch.....	1. 00 "
Butternut.....	1. 60 "
Elm.....	1. 00 "
Maple.....	1. 00 "
Oak, red.....	0. 97 "
Oak, white.....	0. 93 "
Poplar.....	1. 55 "
Cedar.....	2. 10 "
Douglas fir.....	1. 20 "

Balsam fir.....	1. 80 cords.
Hemlock.....	1. 60 "
Jack pine.....	1. 50 "
Spruce.....	1. 60 "
Tamarack.....	1. 15 "

#### Split Wood is Best

This table gives approximately the heating value of well air dried cordwood but the amount of drying is important. Wood piled with the bark on dries very slowly so that when purchasing wood split wood is to be preferred to small sized round wood since the latter will probably not be so dry and will include more bark and rotten wood which has little heating value.

Some other consideration may at times be as important as the actual heating value of the wood. For instance, the ease of lighting is to be considered if the wood is wanted only for kindling or for a quick fire in the kitchen range in the summer. Cedar and pine are especially good for this purpose. For an open fireplace the hardwoods are best. Spruce makes a very "crackly" fire which is sometimes an attraction but there is always some danger that a spark may be thrown out of the fire to the detriment of clothing or the rug.

#### A Comparison of Ashes

Another point worth bearing in mind in connection with the burning of wood in place of coal, is the difference in the amount of ash produced. A cord of hardwood will make only about 60 pounds of ashes while a ton of hard coal will make from 200 to 300 pounds; judging from the grade of hard coal coming to Canada during the past winter, 1917-18; the latter amount is more likely and some lots will run even higher than this, especially the small "steam sizes." The calorific value of these latter may frequently be as low as 10,000 B.T.U. in place of the 13,000 B.T.U. used in the above calculations.