

## **Wood and Its Distillation**

*The first of a series of articles by Dr. Alfred G. Macintyre, Ottawa*

**T**HE importance of forest reserves was fully illustrated during the recent war and it may be accepted that these, in the future, will be considered one of the "key" resources which must be built up and conserved for any untoward possibilities which may arise.

Early in the war a large number of scientific and technical men predicted that, with a good blockade, the Central Powers could not continue the war for more than twelve months, because, by that time, their enormous reserve of cotton, for the manufacture of smokeless powder, would then have become exhausted and they would have no further supply of raw material to produce the necessary propellant powder.

Such persons were evidently unfamiliar with the fact that, as early as 1909, one of the German Imperial powder factories had made excellent smokeless powder by the substitution of the cellulose of wood pulp for that of cotton and thus, when the supply of the latter was cut off, the explosion factories had recourse to the employment of wood-pulp manufactured from their 25 million acres of forest reserves. The Central Powers, as a result, did not suffer through lack of raw material for making propellants and carried on, in this way, with an ample supply until crushed by other means than the cotton blockade.

Besides the pulp industry there exists another important "key" industry associated with forestry products namely: that of the distillation of wood. The acetone necessary, as a solvent, in the manufacture of cordite, in pre-war times, was solely made from acetate of lime, a product of the destructive distillation of hardwoods. The acetic acid and acetates required for aeroplanes and such like were also obtained in the same way. It is true other methods of preparing these substances were developed, owing to the great shortage, but most of them ceased to be employed as soon as the war ended.

### *Charcoal an Ancient Product.*

No one can say when and where the first primitive method was introduced for the manufacture of charcoal from wood, but it is certain that this substance was made more than 5,000 years ago. The same uncertainty exists regarding the place and date of the first recovery of the condensable gaseous products obtained by the charring of wood. It is probable that it commenced with experiments at the early part of the 18th century, carried out by the phlogistonists in an endeavour to separate the "active spirit" of wood. The earliest British works, for the distillation of wood and recovery of the pyroligneous acid, were erected between 1790-1800 and these existed in connection with the supply of charcoal for the metal industries of the districts of Sheffield and Glasgow, and the production of acetic acid and acetates for the dyeing and calico printing industries. The Scottish works date from the beginning of the nineteenth century and are interesting for two reasons: first, that some of the original factories are operating under the same firms today, and second, that these works sent forth the pioneers who built up this industry on the American continent. Messrs. Turnbull, of Glasgow, who have possessed, at different times, a considerable number of works in Scotland and Ireland, built a plant early in the last century on a small brook called the "mill burn" which flows into the river Leven just south of the town of Alexandria, Dumbartonshire, and it became known as the "Millburn" works. This firm, in 1848, decided to build a plant in America, and early in 1849 men and material were sent from Scotland, the workers largely from Millburn to a site near Binghampton, New York, to erect and operate a factory. The place received the name of Millburn from the home works. This was the first plant for the distillation of wood in America and from it developed the industry in the United States which today comprises 100 factories with a total capa-