

## New Sources of Paper Manufacture

**Inventive Genius Stimulated by Present Scarcity of Wood Pulp and Heavy Demand**

The comparative scarcity of pulp for paper-making and the consequent high prices for newsprint are reflected in the stimulus given to research all over the world in an endeavour to widen the field of raw material for paper manufacture. A brief review of some of the possible competitors with Canadian spruce and balsam may be interesting.

**Esparto** is a grass-like plant found in Spain, Algeria, and Tripoli. It was used for paper-making in Great Britain as early as 1857. During the war, the scarcity of other sources of pulp gave it greater prominence. The fibres are short and weak, and the pulp is best used for filling and is employed largely in mixtures with longer and stronger fibres. In papers in which considerable strength is needed, not more than 20 per cent of esparto can be used.

**Zacaton** is a plant belonging to an American genus of the same family as esparto. It is principally found in Mexico, where it grows profusely in certain regions. Experiments with this material, conducted by the Bureau of Plant Industry of the U. S. Department of Agriculture, showed that a satisfactory paper could be made from it by means of the soda process. Indeed, the report of the investigation was published on paper made from zacaton. The experiments were not, however, conducted on a scale sufficient to make any estimate of the cost of manufacture. At present, zacaton is a waste product and flourishes in a region remote from paper-manufacturing sections.

**Hemp hurds** have also been investigated by the Bureau of Plant Industry. After several trials, under conditions of treatment and manufacture regarded as favourable in comparison with those used for pulp-wood, paper was produced which received very favourable comment both from investigators and from the trade, and which, according to official tests, would be classed as No. 1 machine-finish printing paper. The quantity available is not great, however.

**Flax straw and tow** may replace imported flax-waste in the manufacture of wrapping and writing paper. If this can be done, a market would be furnished to Canadian farmers for disposing of what is now a waste product.

**Bamboo** is coming to the fore in India and Burmah. Mr. William Raitt, consulting cellulose expert to the Indian Government, states that there remain no practical difficulties in transforming bamboo into pulp. Bamboo has the great advantage that it renews itself annually, whereas pulpwod takes half a century to grow.

**Tropical reeds and grasses** found in the Nile "sudd" of the Bah-

al-Ghazal province of the Sudan have been experimented with for paper-making, and, while complete success has not been attained, it is quite possible that the difficulties will be eventually overcome. The supply is unlimited.

**Anhinga**, a plant growing along the banks of the sluggish rivers of the state of Para, Brazil, is stated to be an excellent paper-making material, but the great profits to be obtained in the rubber industry have hitherto hindered its exploitation. Mills are now, however, being put in operation for the utilization of this fibre.

**Ajimo** is a seaweed found in Japan. It reproduces itself in less than six months. It is said that paper can be produced from it at much less cost than from wood, and a Japanese company has been formed for the purpose of turning out ajimo paper.

**Jack-pine** is a promising material in the paper-making field. As jack-pine is very common in Canada's northern hinterland, the commercial exploitation of this species would prove very valuable to supplement our dwindling stocks of spruce and balsam.

In the manufacture of newsprint wood-pulp still dominates the field, but one dare not predict that this will always, or even will long, be so. In the temperate zones, however—and proximity to the world's industrial centres is an important factor—there appear at present no serious rivals to our great pulpwod forest species.

## Gasolene Extracted from Natural Gas

**Its Removal is a Benefit rather than otherwise to the Gas**

It has been assumed by many people that taking the gasolene out of natural gas impoverishes the gas and thus reduces its heating value. Recent investigations by the U. S. Bureau of Mines, however, have demonstrated that this assumption is without any foundation and that, on the whole, its removal is beneficial rather than detrimental.

One gallon of gasolene in the natural gas burned by the domestic consumer as gas is worth to him about one and three-quarters cents in heat value, while this same gallon of gasolene to the automobile user is worth about 35 cents.

Taking the gasolene out of the gas, one gallon will equal 45 cubic feet of gas, but this is not taken from the consumer, because his gas is measured at his home meter and he obtains 1,000 cubic feet of gas irrespective of whether the gasolene is removed or not. The loss to the consumer is therefore the difference between one and three-quarters cents and the cost of 35 cubic feet of gas, which at 35 cents per 1,000 is one cent. The net loss in heating value, therefore, is less than one cent per 1,000 cubic feet.

On the other hand, the removal of the gasolene is a positive benefit

to the consumer. Until the gasolene removal plants were installed, the gasolene and water condensed in the pipe-lines, thus disintegrating the rubber gaskets in the couplings, which, in turn, permitted a large leakage of gas, with consequent lowering of the pressure. Such losses aggregate much more than the insignificant heat loss referred to in the preceding paragraph.

Furthermore, the gasolene would be practically wasted if not removed from the gas. The gasolene thus obtained has what is known as a low boiling point; that is, it vaporizes easily, a quality which makes it valuable in starting automobiles, particularly in cold weather. So valuable is it that natural-gas gasolene is blended with straight-run gasolene with a higher boiling point, thus producing a gasolene that automobiles can use without difficulty. If refiners were deprived of the natural-gas gasolene, the automobiles of Canada would have more difficulty in using the gasolene that is being produced from petroleum.

## Cockroaches Convey Cancer among Rats

**Discovery of Danish Scientist Opens up Speculation on Cause of Human Cancer**

Recently Prof. Febejer, Copenhagen, Denmark, discovered that the rats caught in a certain manufacturing plant had cancer of the stomach. Later, this plant was found to be infested with cockroaches.

Further investigation showed that these insects were hosts of a worm hitherto unknown to science. A series of experiments demonstrated that the worm lays its eggs in the body of the rat. These are passed out and eaten by cockroaches. In the cockroaches the eggs hatch and the young worms remain dormant until the cockroach is eaten by a rat. They then begin an active life in the rat's stomach, and appear to have the power of setting up cancerous tumours.

As this is the first time any one has been able to start a cancer *de novo*, the value of this investigation is enormous. Though there would seem to be no doubt that this worm is not the cause of human cancer, it is by no means certain that other types may not exist, having life cycles of a similar kind. Thus a factory infested with cockroaches may conceivably be a great danger, especially if food is handled therein.

All new buildings should be rendered vermin proof, and, wherever possible, existing buildings should also be made safe in this respect. Concrete floors and smooth walls prevent the intrusion of cockroaches, and an absence of unprotected foodstuffs deprives them of any inducement to stay. (Adapted from the London Times.)

## Pulverized Lignite for Power Purposes

**Australian Company Formed to Utilize Low-Grade Coals**

The efficient utilization of lignite coals is a problem not peculiar to our western provinces; indeed, it is a live subject wherever such coal is found. One of the most promising solutions so far as the use of lignite for industry and transportation is concerned, is pulverization.

In Australia a syndicate has been formed "to mine, process and deliver" lignite throughout the Commonwealth. Mining operations are well under way, and the company has erected a pulverization plant in a suburb of Melbourne.

The process employed is briefly described as follows:

"The lignite is mined in either shafts or open cuts, the coal crushed on the spot to egg size, then hoisted to the air-drying tipples at the surface by bucket conveyors. After drying about seven days the coal is relieved of practically half of its moisture content and is ready for final treatment. This final process, which should be undertaken near the place where the fuel is to be used, consists of again crushing the coal—to about half-inch mesh—after which it is passed through a rotary drier, where the moisture content is reduced to about 10 per cent. The fuel is then pulverized, separated by air, and stored in bunkers.

"To use it is blown through pipes, where it is mixed with air in quantity 10 per cent in excess of requirements and ignited at the tip of an adjustable burner, which enables the length and width of the flame zone to be most accurately gauged. Boiler tubes and baffles are kept clear of ash by soot blowers and suction conveyors carry off the ash to any desired place of disposal. Three per cent of the power generated is required to operate the plant, and one experienced man can fire a whole battery of boilers or kilns.

"Under test the boiler efficiency was 80 per cent, the furnace efficiency 78 per cent."

The utilization of pulverized fuel, in relation to Canadian conditions, is treated of in two bulletins published by the Commission of Conservation, entitled *Pulverized Fuel, its Use and Possibilities*, by W. J. Dick, and *Fuels of Western Canada*, by James White. These are available for distribution gratis to interested parties on application to the Commission.

Metallic arsenic, running \$200 in value to the ton, has been discovered on the Queen Charlotte islands.

An ex-Canadian officer, with Prince Edward Island experience, is establishing a fur-farming industry in Scotland. Lynx, beaver and silver foxes will be raised.