Alcohol and Bitumen Sands for Power

Engineering

Following are reports of some of the leading papers presented at the recent meeting of the World Power Conference at London.

Britain's never-setting sun will be called upon to furnish fuel for power and transportation when the world's oil supplies run low, Colonel Sir Frederick Nathan, well-known English ordnance expert, told the World Power Conference in London. Alcohol, though now too costly as compared with oil fuels, stands ready to come to the rescue when the latter send up distress signals in the form of relatively small advances in price.

In fact, alcohol is already a source of power in many countries of Europe, where it is marketed for the most part as a mixture with gasoline or benzol. In Germany the power alcohol consumption as long ago as 1903 went over the million-gallon mark, and now the sale of "Monopolin," a mixed fuel which is a State monopoly, calls for the production of over 3,000,000 gallons of fuel alcohol a year.

Fuel alcohol is a commercial success in Germany, Sir Frederick explained, because its production is based on the German potato crop, which has been especially fostered for many years. Between 5 and 6 per cent. of all German potatoes go into alcohol. In Britain alcohol can not be produced economically from home grown crops; but the colonies and commonwealths within the Empire are in better position to supply starch and sugar materials for conversion into alcohol. The tropical and semi-tropical lands under the British flag are especially well adapted for such production.

But there may be a long day to wait before all the oil resources of the British Empire are exhausted. K. A. Clark, Canadian fuel geologist, reported on the existence of a vast bed of bituminous sand in Alberta, which may be exploited when the easily skimmed cream of the oil wells has been used up. The deposit lies along the Athabaska River in the northern, unsettled part of the province, the southern edge of the area being 300 miles north of Edmonton. The formation varies from 100 to 200 feet in thickness, and is known to exist throughout an area of from 750 to 1,000 square miles. It lies very close to the surface, in most places less than 100 feet below ground level. Various "cracking" processes are reported to be fairly successful in getting a useable oil out of the bitumen content.

Diesel engines, using heavy oils, are now in successful use on Russian railways, according to F. Yanchouschevsky, Russian engineer, who spoke before the conference. Three locomotives of this new type, two of them built in Germany and the other in Russia, have been in experimental use on the Moscow-Baku trunk line, and the results are held to justify further construction.

The locomotives (*Turn to next page*)

Alaskan "Ice Jumble"

Geography

A strange "near-glacier" of mammoth proportions was discovered in Alaska this summer during the expedition of the National Geographic Society to study volcanoes along the Alaskan peninsula, according to C. P. McKinley of the U. S. Geological Survey, who has just returned to Washington. The expedition was led by Dr. Thomas A. Jaggar, director of the Hawaiian Volcano Laboratory.

For lack of a better name, Dr. Jaggar termed the near-glacier an "ice-jumble," since he never before had seen anything like the peculiar geological formation. He expressed the belief that it is the result of the continuous dumping of volcano ash into the area for hundreds of years. The materials consist, Mr. McKinley explains, of ice, gravel boulders, pumice, ash and sand in a vast hummocky sea. Four streams flow from the front of this near-glacier in virtually the same fashion as from an actual glacier. Nearby and above, the mighty Pavlof volcano fumes constantly from its symmetrical cone, a veritable American Fujiyama.

Another natural phenomenon witnessed by the scientists at close range for probably the first time in history was the (*Turn to next page*)

Man's Antiquity in America Debated

Anthropology

That the American continent has been inhabited by men at least twenty thousand years, judging by important evidence unearthed at Folsom, New Mexico, is the claim of Barnum Brown, of the American Museum of Natural History.

Sixteen stone arrow points found buried with the bones of thirty extinct bison are the evidence of a prehistoric buffalo hunt which Mr. Brown said demonstrates the antiquity of man on this continent. The oldest Americans whose skeletons and possessions have been found are the basket-maker Indians, who date back perhaps to 2000 B. C. But the search for older Americans than these has been vigorously pursued. In about forty instances, bones of ancient animals have been found with human weapons, but whether the bones and weapons were really of the same age has been debated to no conclusion.

Mr. Brown, who has just returned from examining the scene of the buffalo hunt, said that he dug out one of the arrows himself. The layers of earth in which the bones have become buried and other geologic features of the site indicate the great age of the deposit, he said. The Colorado Museum of Natural History first examined the remarkable site. Now, the American Museum of Natural History is cooperating in the study of the region.

The arrow points are of strangely fine workmanship, rivaling the weapons of Stone Age Egyptians.

The antiquity of these cleverly made weapons is questioned by Dr. Ales Hrdlicka, of the Smithsonian Institution.

Dr. Hrdlicka states that there are five weaknesses in the evidence which argue against the high antiquity of the finds. The Indians rarely killed game in large quantities, and after a killing the parts of an animal were economically made use of, including the bones. The skillfully made weapons, he believes, could not be very ancient. Dr. Hrdlicka's interpretation of the scene is that the buffalo herd became mired there while trying to drink at the stream, and that the arrow points might have been thrown into the stream much later by Indians making religious offerings, and so have been washed into proximity with the bones. The evidence so far recovered is not sufficient, he declares, indisputably to prove man's geological antiquity on this continent.

World Power Conference—*Continued*

weigh 118, 131 and 182 tons, respectively, and are designed for freight hauling at relatively low speeds. One of them has electric transmission, while the other two are equipped with mechanical transmissions, operated through a specially designed magnetic clutch.

The advantages of heavy-oil engines in general, in view of the constantly increasing shortage of gasoline and other vaporizing oils, formed the theme of much of the discussion. Prof. M. Defays, a member of the Belgian delegation, stated that the cost of the fuel consumption in the heavy-oil types of engine as compared with that of gasoline is three to six times less, while in weight the consumption is reduced to 80 per cent. and even to 50 per cent. of that of gasoline. The fuel cost for locomotives, compared with that of coal, is noticeably less; in weight the consumption is at least six times less. For aviation, the saving in fuel cost compared with that of gasoline is very marked, while the fire danger is practically eliminated. Diesel engines for automobiles, Prof. Defays declared, can get along on a third or even a fiffth of the fuel required for the present gasoline-burning types.

"The struggle between the railway and the road will become more and more in favor of the road," he prophesied. "The result will be that in order to defend itself against the heavy oil engine the railway will have to adopt the same prime mover. The chief use of the railway will be for transporting heavy goods and passengers over considerable distances.

"Aviation will gain in security while the cost of air transport will be considerably decreased. Commercial aviation will be used more freely for the transport of passengers and mails as well as for merchandise."

The conference was not wholly occupied with questions of huge engines for railways and factories. Power for the housewife's work came in for its share of discussion. And the old kitchen range had to accept condemnation for extravagance as well as for discomfort. Dr. Margaret Fishenden declared that with gas or oil a meal can be cooked at one-fifth of the thermal consumption in the use of a coal stove, while the heat used in an electric range is only one-thirteenth that of coal.

Swedish frugality in the use of wood was related by Axel Härlin. Not only is every scrap used for the conventional wood purposes, but at the end even the shavings and sawdust find chemical employment. Investigations are now being carried out, he said, with a view to producing oil from waste wood, and the production of sugar from wood is now a definite technical possibility.

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The water ouzel is an unusual American bird which can walk under water, and which sings all winter.

Bright red catsup can be made without artificial coloring matter, if simple precautions are taken.

"Ice Jumble"—*Continued*

great group of pinnacle-formed peaks on the peninsula known as the Aquileen Pinnacles. Averaging 4,800 feet above sea level, they resemble a vast number of church spires.

The expedition's route lay from Squaw Harbor on Unga Island, in the Shumagin group, to Canoe Bay, head of Pavlof Bay on the Pacific side of the Alaska peninsula, then along the shore of the Pacific westward to King Cove. Besides Dr. Jaggar and Mr. McKinley, the personnel consisted of R. H. Stewart, photographer; John Gardner and Peter Yatchmeneff, field men, and a cook.

From a scientific standpoint, Mr. McKinley says, the expedition was a signal success. This was the second summer of the Society's four to five year survey, under Dr. Jaggar, of the greatest chain of volcanoes in the North American continent. The party scaled a newly found volcano peak in the northern part of the Alaska peninsula; collected data for a topographic map of 1,500 square miles of hitherto unknown territory; and assembled a wide variety of geological, botanical and biological specimens.

Being marooned on an island without food for four days; hiking across miles of rough country filled with volcano ash that was knee deep at times; and pulling horses out of almost impenetrable marshes, were a few of the unusual experiences that removed the daily routine from monotony.

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