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PRODUCTION OF OIL FROM PLANT MATERIAL

By Professor E. BERL

CARNEGIE INSTITUTE OF TECHNOLOGY

INTERESTING information is given about the oil situation in this country in the excellent article by Dr. P. K. Frolich,[1] past president of the American Chemical Society. Dr. Frolich states that the time is not far off when oil products should be obtained from sources other than natural oil, for example, by the hydrogenation of coal or carbon monoxide produced from coal or from natural gas or from oil shales. Not all experts in this field agree with statements about the coming scarcity of oil within the boundaries of the United States.[2]

In previous communications to SCIENCE,[3] I have stated that carbohydrates which are contained in farm products, wood, algae, etc., and which are formed by nature in enormous amounts and with greatest ease (see Table 1) can be converted into liquid fuel.[4]

[1] P. K. Frolich, SCIENCE, 98: 457, 484, 1943.
[2] W. Pratt, *Oil and Gas Jour.*, January 30, 1944, p. 78.
[3] E. Berl, SCIENCE, September, 1934, and January, 1935.
[4] J. G. Lippmann, *Ind. Eng. Chem.*, 27: 105, 1935.

According to such statistics, at the present rate of oil extraction, the cheap oil in this country would be gone in about fourteen years; therefore, it is imperative that ways and means should be used in order to allow a continuous production of liquid fuel after the exhaustion of that oil under ground which can be recovered at relatively small cost.

TABLE 1

Plants	2.7×10^{11}	metric	tons	of	C	content
Annual production of cellulose and other carbohydrates	3×10^{9}	"	"	"	"	
Crude oil reserves in U. S. A.	2.64×10^{9}	"	"	"	"	
Crude oil reserves in world	4.4×10^{9}	"	"	"	"	
Annual oil production U. S. A.	1.93×10^{8}	"	"	"	"	
Annual world oil production	2.94×10^{8}	"	"	"	"	

One can get from cornstalks, corn cobs, sugar-cane, bagasse, seaweed, algae, sawdust, Irish moss, molasses, sorghum, grass or any other carbohydrate-containing