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The Oxidation of Glucose by Rhizobium meliloti

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blood (with and without fluorides) kept at –3°, 23°, and 38°C. for periods as long as seventy-two hours was analyzed at given intervals for total and reduced glutathione. Oxygen content of the blood was also determined simultaneously with glutathione on the specimen kept at 38°C.

The rate of disappearance of pure glutathione added to water and to blood kept at 38°C. for periods as long as forty-eight hours has also been studied.

No apparent correlation was found between oxygen content and capacity of blood and the concentration of reduced and total glutathione. The reduced and total glutathione during gestation was within the general range of the normal non-pregnant. The values for the toxemias of pregnancy were approximately the same as those of the normal pregnant. Glutathione values of cord blood were somewhat higher than those of maternal blood.

Oxygen content of aerated and non-aerated blood at 37°C. decreased at a uniform rate over a period of time until oxygen depletion. Glutathione concentration did not change appreciably the first twelve hours, but thereafter decreased slowly until nearly depleted. At a lower temperature (23°C.) the rate of diminution was decreased, while at –2°C. no glutathione was lost after twenty-four to thirty-six hours. Added glutathione disappeared more rapidly from blood than from water kept at 38°C. for several days. Sodium fluoride added to blood at 37°C. slightly increased the rate of diminution of glutathione over a twenty-four hour period.

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THE OXIDATION OF GLUCOSE BY *RHIZOBIUM MELILOTI*

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The extent of oxidation of glucose by *Rhizobium meliloti* has been determined by comparing the amount of oxygen consumed with the theoretical amount necessary for complete oxidation to carbon dioxide and water. With M/540, M/270, and M/180 concentrations of glucose as a substrate, the rate of oxygen consump-

tion increased rapidly for a period of from 4 to 8 hours then decreased to a low and fairly constant value. The total consumption of oxygen was approximately one-third of the amount required for complete oxidation of the glucose.

The respiratory quotient during the period of high oxygen consumption attained a value of about 1.2, then decreased to about 0.8 where it remained fairly constant.

With ammonium nitrogen the percentage of glucose carbon that appeared as CO_2-carbon was less than with nitrate nitrogen. The nitrate apparently was able to serve partially as an hydrogen acceptor.

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ALCOHOL MOTOR FUELS

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The proposal to encourage the use of power alcohol made from farm crops grown in the Continental United States, as an aid to agriculture, is not new. Since the last consideration, something more than ten years ago, anhydrous ethyl alcohol has become commercially available. This development makes it feasible to use alcohol-gasoline mixtures. The power alcohol project is thus placed upon a new basis and is worthy of a new consideration.

An examination of the physical-chemical properties of alcohol-gasoline mixtures shows that these properties are not additive. The blends containing 10 to 20 per cent of alcohol do not differ from gasoline in such a manner as to make them unsuited for use in present day gasoline engines. On the contrary, the differences which do exist are of such a nature as to favor their use as fuels. Thorough dynamometer and road tests have shown that such blends are, in most respects, superior to gasoline. They give the same or better mileage, as easy or easier starting, will stand higher compression without detonation, give smoother engine operation, greater power and cleaner combustion. These blends can safely be handled in present commercial distribution and storage equipment. There are no technical difficulties in their preparation, distribution, or use, and this has been amply demonstrated by widespread commercial sale in foreign countries and lately on an experimental basis in the United States.

The 10 per cent blend will cost approximately 2 cents per gallon