

suggestion of the senior author of the present paper and under the direction of Professor E. F. Farnau, of the University of Cincinnati, carried out experiments bearing on this hypothesis. Briefly summarized, these experiments suggested that sulphates could be reduced to sulphides at temperatures of approximately 150° C., and thus within the ranges anticipated in oil fields on the basis of the geothermal gradient but above the probable viability of bacteria.

Colacurcio, after autoclaving the reagents to kill bacteria, used potassium, calcium, and magnesium sulphates and obtained reduction with the aid of sulphide-free West Virginia paraffin-base crude petroleum. He employed iron bombs, cadmium chloride as indicator, temperatures ranging from 85° to 250° F., and periods varying from 1 to 24 hours. Though positive results were obtained at the elevated temperatures mentioned, room temperatures for periods of as much as two months gave negative results only.

Bengtson used longer periods, glass bombs, and strip silver as a more delicate indicator. In the main his results also were positive, the sulphate reduction being most pronounced in the presence of ferrous sulphate and of clay as catalysts. His governing temperatures ranged up to 257° F. and his periods were chiefly three days long. Negative results only were obtained at temperatures approaching those of the room despite increases in time up to a total of seven days. The oil was Pennsylvania "crude."

The purpose of this brief notice is two-fold. First, it is desired to present the results of the experiments described above in abstract, in view of their obvious bearing upon the possible derivation of "asphalt"-base petroleums from those with paraffin as base; especially is this summary desirable because of the fact that the results have never been available to students of the subject. Second, the present authors take this occasion to announce the fact that they are now essentially repeating and extending the experiments of Colacurcio and Bengtson with the aid of a furnace constructed to maintain slightly higher but static temperatures for several months at a time. They will vary (a) temperatures and pressures within the ranges known or estimated to exist in present reservoir rocks, (b) the paraffin compounds used, confining themselves, however, to simple paraffin group members in place of complex natural petroleums, (c) the oxidizing agents, and (d) the catalysts which might occur in nature, such as colloidal silica and "kaolin."

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ON A SCURVY-LIKE DISEASE IN CHICKS

HOLST and Halbrook recently reported¹ that in the course of nutritional studies on baby chicks they observed the development of a "scurvy-like" disease the symptoms of which they say are nervousness and lameness, external and internal hemorrhages, bones often brittle and extremely low hemoglobin content of the blood. A cure was said to be effected by feeding five grams of cabbage per bird.

In an attempt to confirm the observation of Holst and Halbrook, three lots of twenty-five day-old Leghorn chicks each were placed on the following diets. Lot 101 was fed the Holst-Halbrook diet, the formula of which was kindly furnished us by Everett R. Halbrook, consisting of fish meal, 20.5 parts; ground yellow corn, 49.5 parts; ground whole wheat, 25 parts; air-dried yeast, 2 parts; ground oyster shell, cod liver oil and salt, 1 part each. Lot 102 received the above diet, except that autoclaved yeast was substituted for 8 parts of yellow corn and for the air-dried yeast. Lot 103 received the Holst-Halbrook diet, except that meat scrap meal was substituted for the fish meal.

At the end of eight weeks no symptoms of vitamin deficiency had been observed in any of the chicks. When the growth data were given statistical treatment it was found that lots 102 and 103 showed significantly better growth than the Holst-Halbrook lot, lot 102 showing the best growth.

No attempt is made to explain the observations of Holst and Halbrook; however, a "scurvy-like" disease could not be reproduced, and better growth was obtained by adding autoclaved yeast to the diet.

The authors are indebted to Professors J. S. Hughes and H. M. Scott for assistance in this study.

ROMAYNE CRIBBETT

JOHN T. CORRELL

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¹ SCIENCE, 77: 354, April 7, 1933.

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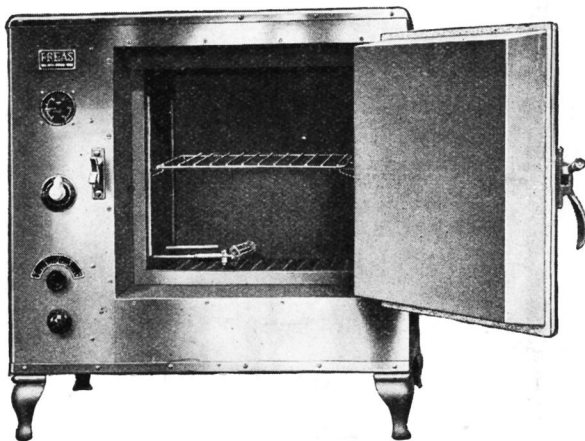
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