have curbed photosynthetic activity of green plants over large parts of the earth, resulting in a slight lowering of the oxygen content of the air. Such a hypothesis can be verified only by better determinations of the diffusibility of gases through ice and by more accurate laboratory procedures for the extraction and analysis of the gas. No particulate matter could be detected in our ice pieces, but we cannot exclude the possibility of oxygen loss from dust oxidation. Whether or not enough organic material can be obtained from the ice for radiocarbon dating we do not know.

In our random investigation we did not encounter ice with gas bubbles rich in oxygen, which is suggestive of frozen, air-saturated water such as one might encounter in temperate-type glacier ice.

The bubbles in our icebergs were found to be under pressure, usually between 2 and 6 atm. Why the pressure seems to vary so much from one part of a berg to another is a puzzling problem. If such pressure gradients can persist in the bergs for a long time they might reflect something of the history of the berg such as the depth in the glacier from which it came.

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References and Notes

1. P. F. Scholander *et al.*, *J. Cellular Comp. Physiol.* 42, suppl. 1 (1953).
2. Distilled water equilibrated at 20°C with air was frozen in a horizontal, rotating tube so that the gas and a small amount of unfrozen water collected in the center. The gas phase held 32.6 percent oxygen as against a theoretical value of 34.0 percent. The deficit undoubtedly remained dissolved in the unfrozen water.
3. Contribution No. 818 from the Woods Hole Oceanographic Institution. This work was carried out on the *Blue Dolphin* Labrador Expedition, 1954, under the auspices of the Arctic Institute of North America, project ONR-138, with funds provided by the Office of Naval Research.
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6. P. F. Scholander *et al.*, *Biol. Bull.* 101, 178 (1951).
7. P. F. Scholander *et al.*, *ibid.* 109, 328 (1955).
8. Analyses of the air at Point Barrow, 71°N, in Alaska showed it to be constant throughout the year and exactly the same as air in southern latitudes, namely, 20.94 percent oxygen. R. J. Hock *et al.*, *J. Meteorol.* 9, 441 (1952).

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Synthesis of Coffinite—$USiO_4$

A recent communication by Stieff, Stern, and Sherwood (*1*) gave a preliminary description of a new mineral, coffinite ($USiO_4$), which has become recognized as a major uranium mineral on the Colorado Plateau. Coffinite is described as a fine-grained black mineral; it is best identified by its x-ray powder pattern. The crystal structure is tetragonal, isomorphous with thorite ($ThSiO_4$). It was also noted that all attempts to synthesize $USiO_4$ had been unsuccessful to date. We have spent some time on attempts to prepare $USiO_4$, and our work has now progressed to the point where a preliminary report can be made describing the synthesis of coffinite by a hydrothermal process (*2*). The synthetic coffinite has been identified by its crystal structure, even though pure material suitable for chemical analysis has not been isolated.

Our procedure is, briefly, as follows: 1 mmole each of uranium tetrachloride and sodium metasilicate are dissolved in 10 ml of water. Sodium hydroxide solution is added dropwise to the uranium-silicate solution until a stiff gel forms near the neutral point. Enough additional base is added to make the mixture slightly alkaline (*p*H 8 to 10) (*3*). The gelatinous precipitate is then centrifuged and transferred to a vitreous silica tube, which is placed in an Inconel bomb tube. We carry out these operations in a nitrogen atmosphere to prevent oxidation of the uranium. Whether this precaution is necessary remains to be determined. Other variables in the procedure must also be evaluated. The sealed Inconel tube is heated 4 to 5 days at 250°C to crystallize the $USiO_4$.

Synthetic coffinite appears as a bluish-green solid in the reaction products. The material prepared to date appears to be isotropic under the microscope, but x-ray powder patterns confirm the presence of tetragonal crystals of coffinite. Quartz or cristobalite have been identified as contaminants in all the coffinite preparations that have been made to date. A comparison of lattice dimensions of natural coffinites with the synthetic material gives the following: Arrowhead Mine (*1*), Mesa County, Colo., $a = 6.93$ kx, $c = 6.30$ kx; Jack Pile Mine (*4*), Laguna, N. M. (AE1019), $a = 6.937$ kx, $c = 6.285$ kx; and synthetic coffinite (*5*) $a = 6.977$ kx, $c = 6.307$ kx. The refractive index of synthetic coffinite has been found to be 1.83 to 1.85.

We have heated the black, naturally occurring coffinite (AE1019) in air at 375°C to oxidize away the organic matter with which it is associated. The inorganic residue retains the tetragonal structure, but is then a gray-green color that is characteristic of tetravalent uranium compounds and quite similar to that of the synthetic coffinite.

Naturally occurring $USiO_4$ is reported (*6*) to decompose to UO_2 and amorphous silica when it is heated above 400°C, although Grüner (*7*) reports retention of the tetragonal structure of the Jack Pile Mine coffinite on ignition to 500°C. Our synthetic coffinite has been found to be thermally stable, in vacuum, for at least 5 hours at 700°C.

Work on coffinite, its preparation and its properties, is continuing and will be reported in more detail at a later date.

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References and Notes

1. L. R. Stieff, T. W. Stern, A. M. Sherwood, *Science* 121, 608 (1955).
2. This work was performed under the auspices of the U.S. Atomic Energy Commission.
3. Our reaction products have invariably been UO_2 and silica whenever the mixture is allowed to remain slightly acidic during the heating process.
4. This sample was obtained through the courtesy of J. W. Grüner of the University of Minnesota.
5. Cell constants of the Jack Pile Mine and synthetic coffinite were measured by S. Siegel.
6. L. R. Stieff, personal communication.
7. J. W. Grüner, personal communication.

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Interference in Salkowski Assay of Indoleacetic Acid

The Salkowski reaction (*1*) has long been used as a simple assay for indole derivatives (*2*), although it is not entirely specific for them. In their study of the enzymatic destruction of growth substances, Tang and Bonner (*3*) utilized the Salkowski reaction as an assay for indoleacetic acid (IAA), one of the few compounds that gives a carmine-pink color with the reagent (*2*). Lately the reaction, especially in the modification of Gordon and Weber (*4*), has been widely used for the assay of IAA and other indole-containing growth substances, both in solution and on paper chromatograms. The colored product has recently been ascribed to hydroxylation of the indole nitrogen (*5*).

The assay method is, however, subject to interference from various sources. Siegel and Weintraub (*6*) and others have noted that peroxides interfere by making the pink color too fugitive to be measured, and Brauner (*7*) observed that the reaction is inhibited by light. The experiments described in this report show that a number of other commonly occurring compounds may regularly interfere with the assay and that important changes are caused by exposure to light during, before, or after color development (*8*).