# MOLECULAR BASES FOR UNITY AND DIVERSITY IN ORGANIC EVOLUTION

S. W. Fox*, P. Ruecknagel, and G. Braunitzer+
Departments of Engineering and Plant Biology, Southern Illinois University/
Max Planck Institute for Biochemistry

The origin of biological information on the Earth has been ascribed at various times to DNA, RNA, or protein. The origin of nucleic acids without the action of prior informed protein has not been supported by plausible experiments, although such possibilities have been examined (e. g. Schwartz and Fox, 1964). DNA synthesis has been assigned to a distant unnamed planet (Crick, 1981). The fallacies of concepts involving RNA in this context, despite demonstrated catalytic activity (Cech, 1983), have been reviewed by Waldrop (1989) and Fox (1984).

The one experimentally based explanation for the origin of biological information is the endogenously ordered synthesis of thermal proteins due to the stereoelectronic specificities of the types of precursor amino acid (Fox and Dose, 1972). This method of selfsequencing of amino acids and its results have been described in numerous reports (summaries in Fox, 1981; Dose, 1984; Melius, 1982). Moreover, Ivanov and Foertsch (1986) have accumulated data from the Martinsried protein primary sequence data bank that indicate the selfsequencing of amino acids is part of the ordering mechanism in modern protein synthesis.

The behavior of the thermal proteins and of the microspheres selfassembled therefrom explain the origin of the first cells, the first membrane, the first reproduction cycle, ancient metabolism including ATP-aided syntheses of peptides and polynucleotides, growth, bioelectricity, and of polybiofunctionality in general (Fox, 1980, 1989). Closer study of the products of heating mixtures of amino acids may explain evolutionary origins of unity and diversity in thermal proteins and in organisms.

+ Deceased, 1989