The Evolutionary Synthesis of the 1930s and 1940s may be seen as culminating in the outpouring of literature and celebrations at the centennial of Charles Darwin's *On the Origin of Species* in 1959. Since then, some prominent biologists have challenged, especially in the light of new discoveries in paleontology and molecular biology, fundamental tenets of the evolutionary synthesis. Others reject these challenges. The centennial of Darwin's death in 1982 is an appropriate time to assess what has happened to Darwinism since 1959, and this is the objective of this symposium.

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The Evolution of Human Diet: New Lines of Evidence

Arranged by GLYNN L. ISAAC (*Prof., Dept. of Anthropology, UC, Berkeley*) and ALAN C. WALKER (*Prof., Dept. of Cell Biology and Anatomy, Johns Hopkins Univ., Baltimore, Md.*)

Fri., 8 Jan. / Washington Hilton / Lincoln West

9:00 a.m. Presiding: GLYNN L. ISAAC

Dietary Adaptations of Later Miocene Hominids
RICHARD F. KAY (*Assoc. Prof., Anatomy Dept., Duke Univ., Durham, N.C.*)

Scanning Electron Microscope Studies of Tooth Wear
KATHLEEN D. GORDON (*Lecturer, Cell Biology and Anatomy Dept., Johns Hopkins Univ., Baltimore, Md.*) and ALAN C. WALKER

Bone Strontium Levels as Indicators of Diet
MARGARET SCHOENINGER (*Lecturer, Cell Biology and Anatomy Dept., Johns Hopkins Univ., Baltimore, Md.*) and ANDREW SILLEN (*Research Assoc., Anthropology Dept., Natl. Museum of Natural History, Smithsonian Inst., Washington, D.C.*)

Dietary Implications of Variations in the Stable Carbon and Nitrogen Isotope Ratios of Fossil Bone
MICHAEL J. DENIRO (*Asst. Prof., Earth and Space Sciences Dept., UCLA*)

Archaeological Evidence Relating to the Diet of Early Pleistocene Hominids
HENRY T. BUNN (*Doctoral Candidate, Anthropology Dept., UC, Berkeley*), GLYNN L. ISAAC, and RICHARD B. POTTS (*Lecturer, Anthropology Dept., Yale Univ.*)

Most versions of human evolution involve the view that feeding patterns underwent successive changes. However, there has been a very wide diversity of guesses regarding the nature, intensity, and timing of the supposed dietary shifts. Some interpretations have envisaged early hominids as ravening carnivores, others as placid omnivores or vegetarians. Lines of evidence which could be used for fairly direct tests of such alternative hypotheses have until recently been lacking, so that discussion has been highly speculative. Now a series of new techniques hold out promise for rigorous investigation. This symposium will report on experiments in the analysis of mineral and isotopic composition of fossil human bone and on SEM studies of tooth wear. The relationship of these to the evidence of the functional anatomy of teeth and jaws and to evidence from archaeology will also be reviewed. Since the digestive physiology and the dietary needs and tolerances of modern humans are the end products of the evolutionary sequence that is under investigation, this research should ultimately be of interest to the health sciences as well as for its contribution to understanding of human origins.

[**Sponsor:** AAAS Section H. **Cosponsor:** AAAS Section L]

The Human Knowledge Process: An Evolutionary Dilemma

Arranged by WILLIAM GRAY (*Dir., Malden Court Clinic, Mass. Dept. of Mental Health, Malden*) and ARISTIDE H. ESSER (*Pres., Assn. for the Study of Man-Environment Relations, Inc., Orangeburg, N.Y., and Director for Quality Assurance, Bronx Psychiatric Ctr.; Faculty, Dept. of Psychiatry, Albert Einstein Coll. of Medicine, New York, N.Y.*)

Fri., 8 Jan. / Washington Hilton / Lincoln West

1:30 p.m. Presiding: WILLIAM GRAY

The Transitional Phase in the Knowledge Evolution
JOHN B. CALHOUN (*Chief, Sect. on Behavioral Systems, Lab. of Brain Evolution and Behavior, Natl. Inst. of Mental Health, NIH, Bethesda, Md.*)

Knowledge as an Autopoietic System
BRIAN R. GAINES (*Centre for Man-Computer Studies, Barbican, London, England*)

Emotional Cognitive Structural Modes for Humans and Computers
WILLIAM GRAY

Building Subjectivity into the Computer as a Form of Knowledge
MILDRED L. G. SHAW (*Centre for Man-Computer Studies, Barbican, London, England*)

Knowledge and Mindscapes
MAGOROH MARUYAMA (*Coal Research Ctr., Southern Ill. Univ., Carbondale*)

Can Human Knowledge Tolerate Human Survival?
ARISTIDE H. ESSER

There is much evidence and related theory accumulated over the past 20 years that indicates that the continuing evolution of the human knowledge process has brought humanity to a brief evolutionary transition period more disruptive and critical to survival than any since the inception of culture. We are being forced to implement the next phase of evolution beyond culture by a commensal relation to the computer as a prosthetic brain. Since human learning is not incorporated without an emotional episode, the development of computers able to operate in the emotional cognitive structuring mode and the enhancement of this mode in humans is critical. Capacity to operate in the emotional cognitive structural mode is crucial also in the necessary development of a genuine semantics dealing with nondiscursive symbolic universes, since it is from these universes that knowledge evolution proceeds. Already it has been demonstrated that subjectivity can be built into the computer as a form of knowledge. But more than this, knowledge must be viewed as an autopoietic, or self-creating system, and it must be considered from the point of view of many mindscapes, or cultural orientations, and not only in terms acceptable to Western, technologically oriented man. Finally, the grave question of whether human knowledge can tolerate human survival must be addressed.

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Gaines, B. R. (1982). Knowledge as an autopoietic system. In Program of 148th Annual Meeting of the American Association for the Advancement of Science, pp. 57, Washington, DC.