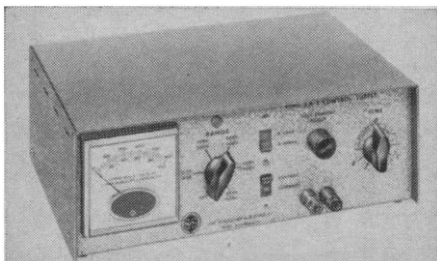


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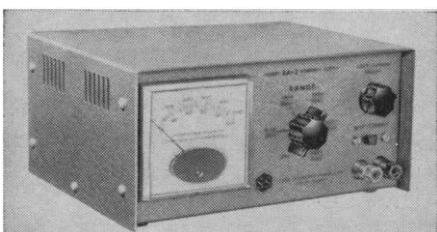
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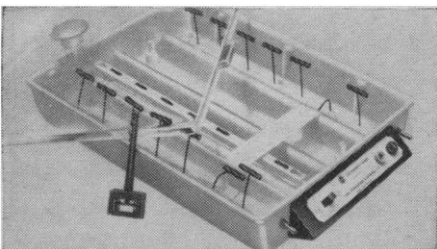
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acetylene reduction, even though the system was sensitive to oxidation and had to be protected with an inert gas during homogenization. When the gas mixture was 5 percent acetylene, 10 percent oxygen, and 85 percent helium, ethylene production proceeded linearly for 7 hours in *Myrica cerifera* and 2 hours in *Glycine max*. This parallels the time course of $^{15}\text{N}_2$ fixation for these tissues. Ethylene production was roughly equivalent to acetylene disappearance in *Myrica* ($5.8 \mu\text{M}$ as opposed to $5.0 \mu\text{M}$ per gram of fresh weight per 4 hours). Acetylene reduction, which could only be detected in nodulated roots, paralleled N_2 reduction patterns in other species of leguminous and nonleguminous plants. Acetylene reduction in homogenates supplemented with $\text{Na}_2\text{S}_2\text{O}_4$ and an ATP-generating system was only one-hundredth that of intact tissues on a comparative weight basis, a relationship not unlike that found for $^{15}\text{N}_2$ with *Myrica*.

R. V. Klucas (Wisconsin) described the use of a simple modification of the French pressure cell which permits disruption of nodules in the absence of air. Soybean root nodules broken anaerobically and exposed aerobically to $^{15}\text{N}_2$ fixed N_2 at reasonable rates.

Work on the primary products of nitrogen fixation in the root nodules of *Serradella* as studied with $^{15}\text{N}_2$ was summarized by I. R. Kennedy (University of Western Australia, Nedlands). Although the labeling patterns obtained were qualitatively consistent with the formation of amino acids and amides from ammonia in a single metabolic pool, a kinetic analysis suggested the occurrence of two or more internal ammonia pools in the early reactions of N_2 fixation. After 45 seconds of exposure to $^{15}\text{N}_2$, the label was in ammonia, glutamic acid, glutamine, aspartic acid, alanine, and asparagine; the asparagine was least labeled. The ammonia pool was saturated within 5 minutes, whereas amino acid and amide enrichment continued at a linear rate. Pulse labeling and displacement experiments with $^{15}\text{N}_2$ indicated that ammonia was a primary intermediate and that glutamic acid and glutamine were the primary amino compounds.

The informal gathering of the colloquium, which was similar to that of previous colloquia [*Science* 147, 310 (1965); *ibid.* 151, 1565 (1966)], provided an opportunity for an exchange

of current data and ideas between workers interested in the mechanism of biological nitrogen fixation, a timely topic of considerable theoretical and practical importance.

W. S. SILVER

Department of Bacteriology, University of Florida, Gainesville 32601

Retirement Crisis

Experts on aging attended a workshop, 3–5 April 1967, in Washington, D.C., aimed at conceptualization of the retirement crisis in developmental terms. The conference was a first and most important step toward stimulating systematic investigation of retirement as a period in human development. There is reluctance, or at least inertia, in perceiving development as life-long. From a life-history viewpoint, it is known, at least in general terms, where the retiring person “came from” developmentally. As yet unknown is the nature of the transition from the producer-adult stage to the end-of-life leisure stage. “Crisis” is used in the sense of a turning point in development that will markedly affect subsequent development.

The discussion strove to formulate researchable questions and hypotheses that will answer the question, “What is the retirement crisis?” Participants agreed that retirement is an amorphous concept that can be viewed as a process, an event, or a transitional period. Retirement as a homeostatic crisis was discussed from various viewpoints. Donahue (University of Michigan) raised the question, “What is the gestation period of retirement?” The general feeling was that few arrive at retirement without having thought about it. This raised the question of differences in occupations.

Eisdorfer (Duke University) listed the covariants age, health, sex, socioeconomic status, nature of job, and emotional balance as determiners of one’s subjective and financial readiness and preparedness for objective retirement.

The group turned to the meaning of work, Eisdorfer pointing out that this is a central issue of the retirement crisis. Medically, nothing is more damaging to the older person than retirement from activity, remarked Bortz (Lankenau Hospital). The concept of work as morally, physically, and financially necessary and good is being challenged, noted Eisdor-

fer. Attitudes may be shifting toward the position that a man is entitled to work if he needs to and wants to—it is his money and his life; but that retirement may free man from work that was not particularly exciting, so that he can at last do as he likes.

Donahue likened the retirement process to bereavement, a loss of the symbols of coping ability, youth, achievement drive and one's career. Eisdorfer expressed some of the meanings of work: it structures the day; produces a product; and gives status, identity, a means of self-expression, money, a full life, social contacts, and perhaps, power. Britton (Pennsylvania State University) asked if the participants could assume that substitutes were needed in all of these areas.

Shanas (University of Illinois) suggested that the group's movement toward a substitution theory be shifted to a discussion of a possible resolution theory of retirement. The problem of retirement, concluded Donahue, is how to quit caring about what you've been caring about and how to start caring about what can still be.

Eisdorfer postulated that one must substitute for the components of work. Some substitution can be in the form of memory; residuals may be dealt with by resolution of conflict. Any remaining would be handled by constriction of life space. Regardless of the coping process, the personality is under stress, with a heightened propensity for aberrant behavior.

Gutmann (University of Michigan) applied Erikson's postulation of alternative resolutions to the retirement crisis. Two ideal life styles emerge from retirement, according to Gutmann: one is alloplastic, a denial of the conflict, an attempt to remain active and deny the lessening of vigor and strength. The other style is receptive of the change, with an autoplasic internalizing, a relaxation of the ego, a reliance on memory and perhaps religion. The former life style can cause more depression and pathology. The latter gives a sense of release from the demands of the society. They are not mutually exclusive. Americans value activity, not passivity and receptivity, Gutmann remarked. One's ego involvement in his job determines, in part, his sensitivity to retirement.

Britton suggested the group separate the correlates of aging from those of retirement and each of these from the interaction of the two. The question

arises, said Eisdorfer, of whether there is a developmental stage consisting of reduction in life space and a desire to give up certain activities in order to conserve energy. If such a stage exists, retirement occurring before this stage is undesirable; after this stage, retirement is desirable.

One researchable question is the environmental theory that aging is a series of failures eventually involuted, said Eisdorfer. Lowenthal (Langley Porter Neuropsychiatric Institute) and Taylor (Pennsylvania State University) cited evidence that problems of aging are very individual; that traumas in the aged occur in those persons who experience traumas over other situations earlier in life.

Tibbitts (Department of Health, Education, and Welfare) identified topics needing further consideration by the group: employment trends of the future; implications of retirement for financial support; the role ascribed to older people; and the physical environment of the community. Lowenthal added to this the developmental aspects of the individual's perceptions of the social context.

Eisdorfer suggested that study is needed of the extent to which the older person is able to live in his context. The disparity between his context and society's causes a measurable stress.

Gutmann pointed to age-grading as a researchable area of retirement. Shanas reminded the group that women had not been looked at yet—the career woman, the housewife, and the woman who is both.

Participants were expected to return with afterthoughts and further considerations of these and related questions about retirement when they met again 15–17 May 1967 for part two of the conference, at Pennsylvania State University. The two-part workshop will be followed by conferences and working groups in fiscal years 1968 and 1969, which will clarify the formulations of the workshop and move toward development of an active research program in retirement under the NICHD's Adult Development and Aging Branch.

The workshop was sponsored by the National Institute of Child Health and Human Development, Bethesda, Maryland.

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