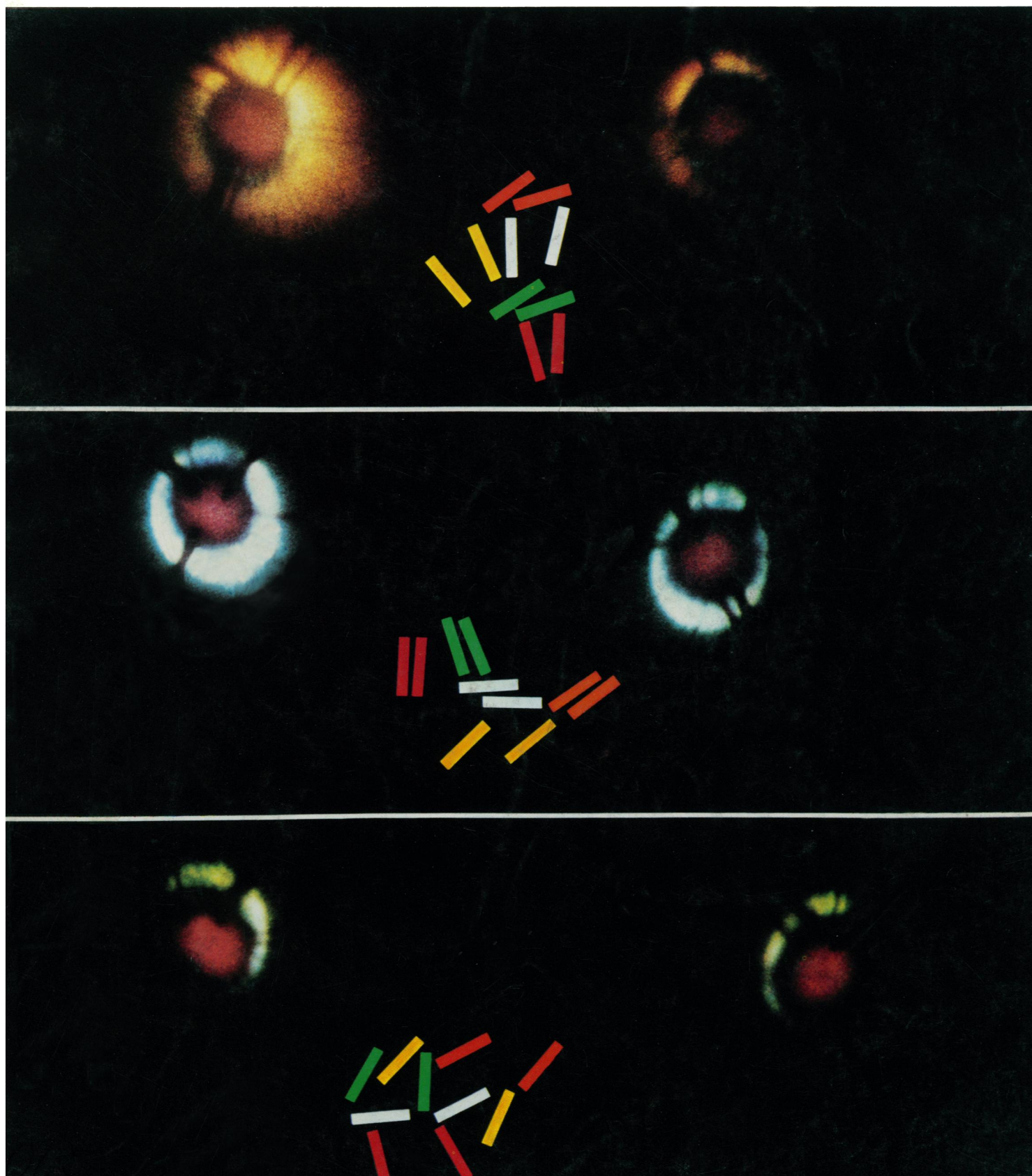


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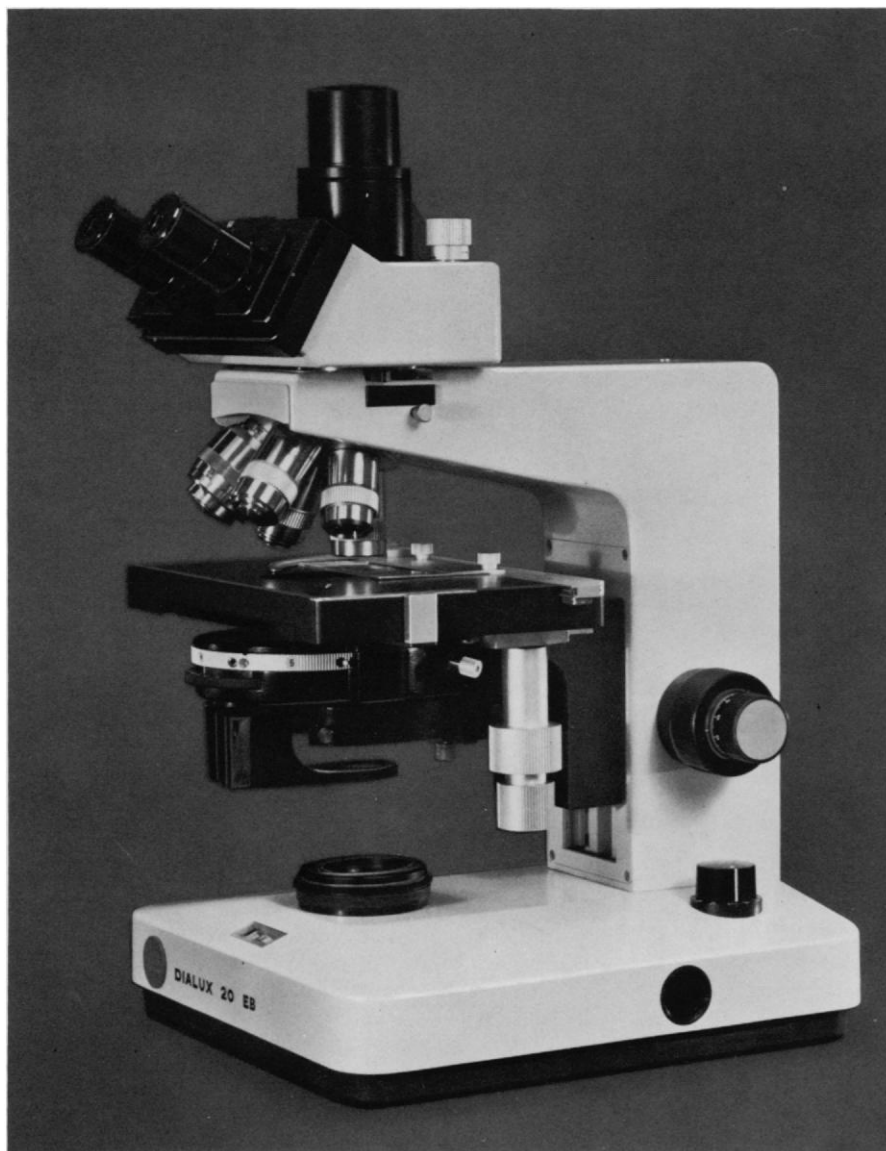
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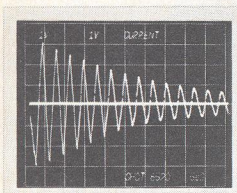
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Time exposures of the left and right optic disks of three kittens, projected on a tangent screen. The colored bars indicate the orientation on the screen of visual stimuli that optimally excited five binocular visual cortical neurons in each kitten. Each color represents one cell's preferred stimuli in the left and right eyes. The top kitten was reared wearing goggles that rotated the image in the left eye eight degrees counterclockwise and in the right eye eight degrees clockwise; the middle and bottom kittens experienced no rotation and the opposite rotation, respectively. See page 285. [Paul G. Shinkman and Charles J. Bruce, University of North Carolina, Chapel Hill]



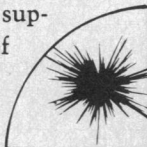
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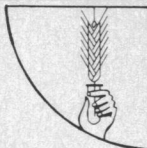
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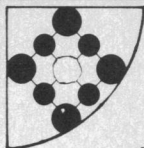
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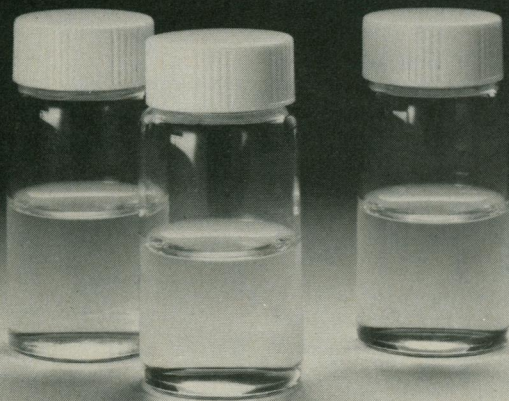
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tigators showed that small amounts of alcohol in humans significantly decreased the ability of the living organism to kill staphylococci.

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Prostaglandin Research

We read with interest Jean L. Marx's review of the rapid advances and possible important clinical implications of recent research on the prostaglandin system in accelerating and inhibiting platelet aggregation and its role in thrombus formation (Research News, 3 June, p. 1072). We wish to respond to some omissions, errors, and misleading statements which concern the discovery of prostaglandin I_2 (PGX, prostacyclin). We reported preliminary findings of the chemical structure of PGI_2 and an isomer in 1970 and published detailed papers in 1971 (1).

At that time we presented chemical evidence of a structure identical to PGI_2 which we called 6(9)-oxy-11,15-dihydroxyprosta-5,13-dienoic acid, or Compound II, abbreviated as 6(9)-oxy- Δ^5 - $PGF_{1\alpha}$. The other isomer which was isolated in larger quantities had a double bond in the Δ^7 instead of the Δ^5 position. It was not possible to know the true stereochemistry of the Δ^5 double bond because of the limited supply of isolated material, so the *E* configuration was drawn for simplicity instead of the *Z* configuration, which Johnson *et al.* (2) recently proved through chemical synthesis. The prostaglandin X isolated by Moncada *et al.* (3) from microsomes of pig and rabbit aorta incubated with prostaglandin endoperoxides appears to be identical to one of the isomers isolated by us 6 years ago and now shown to be

PGI_2 by Johnson *et al.* (2). The similarity in structure of these products with that of the primary prostaglandins suggested to us that they were derived from the prostaglandin endoperoxides which had not yet been isolated (1). Further work by Pace-Asciak demonstrated that purified endoperoxides are indeed converted into these products (4). He discovered that the major stable product in the enzymatic reaction was 6-keto- $PGF_{1\alpha}$, a structure previously unreported (5). The 6-keto- $PGF_{1\alpha}$ appears to be a hydration product of the Δ^5 cyclic ether (PGI_2) which is formed from the prostaglandin endoperoxides specifically by an enzyme termed 6(9)-oxycyclase. This enzyme is abundant in stomach tissue but also occurs in many other tissues (6). The early research on PGI_2 and the discovery of this terminal pathway of prostaglandin endoperoxide metabolism was carried out at the Montreal Neurological Institute of McGill University in Montreal. The statement in the article by Marx that the major breakdown product of prostacyclin, namely 6-keto-prostaglandin $F_{1\alpha}$, was discovered 6 years ago is incorrect. This new prostaglandin was first reported by Pace-Asciak at the Research Institute of the Hospital for Sick Children, University of Toronto, last year (5). Indeed, before the final stereochemical assignment of PGI_2 was known, Pace-Asciak demonstrated that 6-keto-prostaglandin $F_{1\alpha}$ was a major product from the prostaglandin endoperoxides, and he postulated its origin from the Δ^5 cyclic ether now called PGI_2 .

As research in this field is advancing extremely rapidly and has considerable clinical relevance, we feel that a more accurate presentation of the course of events and the people involved is important.

L. S. WOLFE

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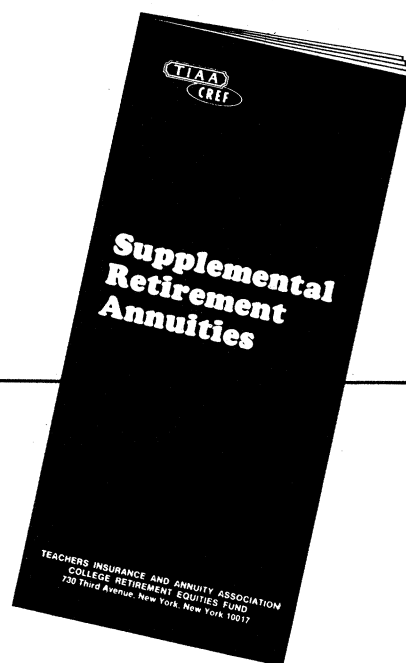
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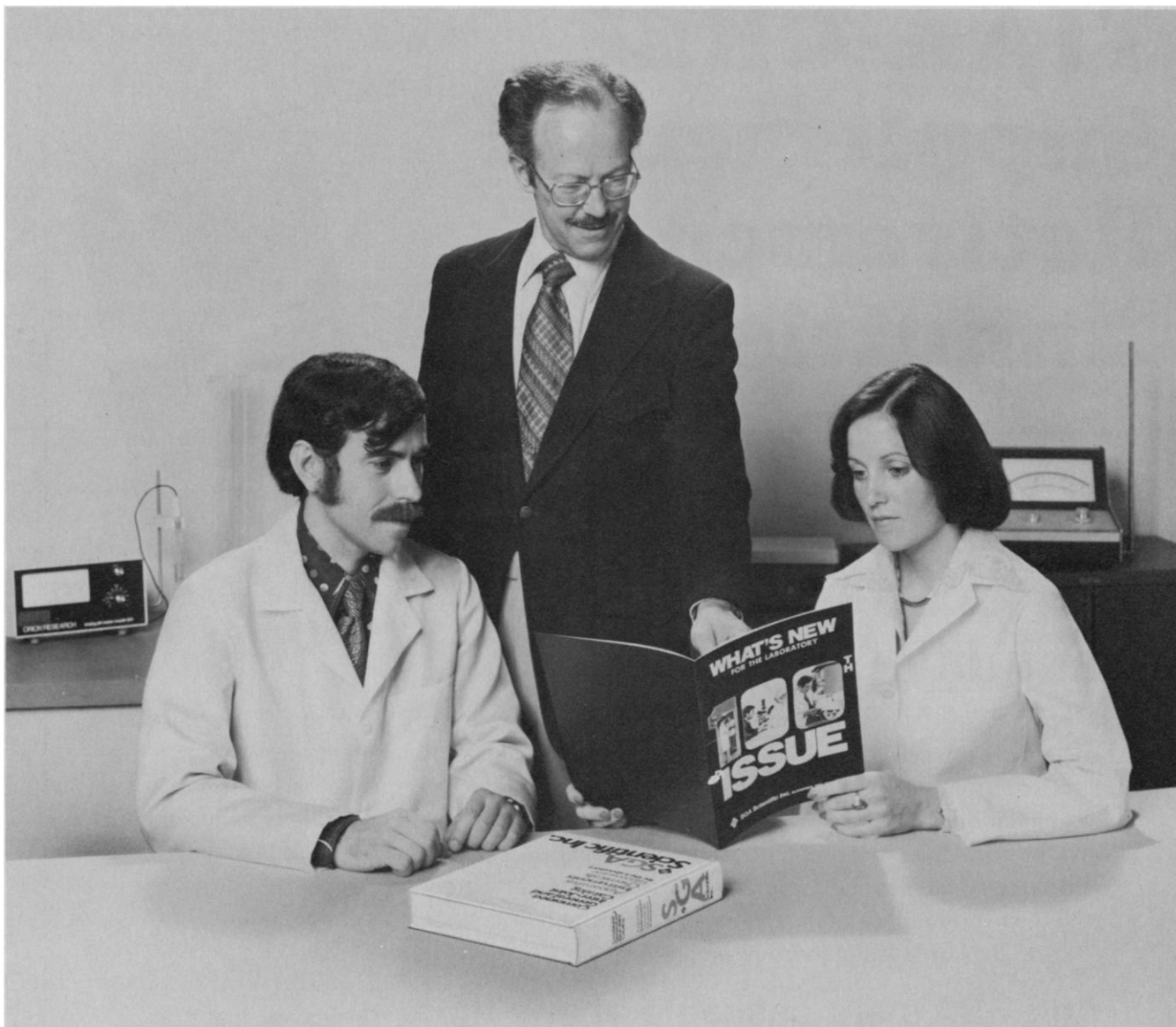
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Soil and Oil

Americans are perhaps tired of being reminded that annual oil imports have risen to 400 million metric tons per year, equivalent to 16 quads of energy, and costing \$36 billion. They do not hear as much about a counterflow of agricultural products, mostly grains and soybeans, that has increased to 100 million metric tons per year, valued at \$23 billion. These farm products represent a relatively small investment of 0.5 quad of fossil energy for machines, fuel, and fertilizers.

Thus, in large measure, the bounty of our farms supports and extends the profligacy of our energy consumption. At first sight, this trade-off between solar energy trapped in plants and the energy in nonrenewable petroleum resources may appear to be a profitable long-term arrangement.

But can the current levels of productivity in the corn, wheat, and soybean heartlands be sustained? In 1971, it was estimated that in the North Central United States, 67 percent of all cropland needed conservation treatment. Since then, highly erosive and sloping soils have been placed in production of export crops, replacing forage crops.

The seriousness of the erosion problem is further indicated by a more recent analysis showing that unrestricted land use would result in a national soil loss figure of 20 metric tons per hectare per year, twice as high as the maximum tolerable rate, according to expert opinion. This could imply that for each ton of grain going to Europe or Japan, we export several tons of topsoil to the Gulf of Mexico!

Soil is a crucial element in the farm production equation. How shall we live, if both soil and oil are depleted? Perhaps we need a negative severance tax on sediment—that is, payments for keeping soil in place. This idea was basic to the national soil conservation policy that has succeeded in breaking the back of the erosion problem, but not in reducing it to a tolerable level.* Meanwhile, the programs implementing the policy have been allowed to wither over the past two decades.

Ironically, this neglect is in part attributable to the phenomenal success of another national policy of even longer standing, namely federal-state cooperation in the use of public funds for farm production research, development, and demonstration.

Historical trends suggest that soil losses are not necessarily caused by high yields: good conservation and high productivity are compatible. But it is equally clear that some soils are being mined. The implication is that the freedom to use any land for any purpose is to be tempered with a judgment as to how the private and the common enduring interests are best served.

Who is responsible for this? Soil conservation practices often appear not to be good business over the short haul. We should not depend on ethically inspired voluntarism any more than we can in other conservation issues. The stewardship challenge is one for the nation and its institutions, to be met through a voluntary partnership based on material interests. But a mere revival of the old system and adequate funding of existing programs will not be sufficient.


Farm operations can have a significant environmental impact, and undue loss of soil is classified as a nonpoint pollution source. Granting blanket exemptions for farm operations or regimentation through permits and fines are nonsolutions. But much can be said for an amalgam of short-term risk sharing in the production and marketing of crops with long-term risk sharing in the conservation of soils, as long as participation is voluntary.

Such a policy may not be popular. But it is fair to ask whether protection against the vagaries of weather and markets should be extended without assured conservation of the soil resource. Without such a provision, our now profitable solar energy enterprise may well decline through a bad trade of soil for oil.—CORNELIUS H. M. VAN BAVEL, *Department of Soil and Crop Sciences, Texas A & M University, College Station 77843*

*See L. J. Carter, *Science*, 22 April 1977, page 409.

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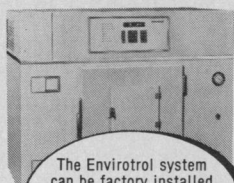
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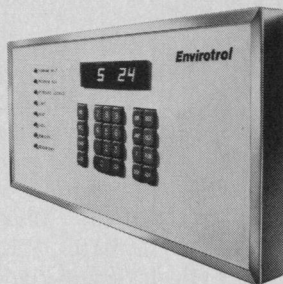
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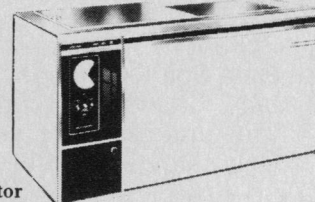
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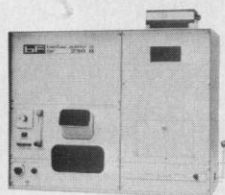
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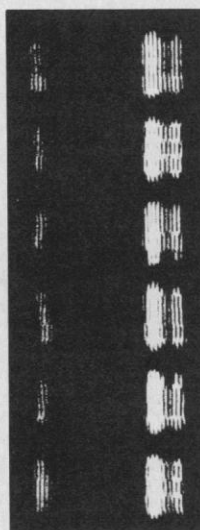


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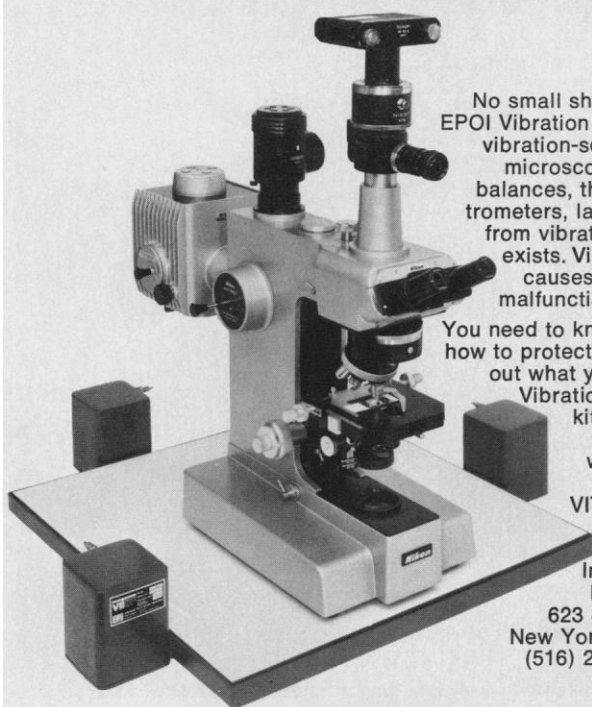
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VIT VIBRATION
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TABLES

RESEARCH NEWS

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birth-spacing in living primate females, which, except for human females, only rarely become pregnant while they still have dependent offspring. Those whose offspring remain dependent for many years thus have long periods between births. This causes a problem for the present-day apes, which, Lovejoy says, are "relict species" occupying ecological niches in which they have little competition.

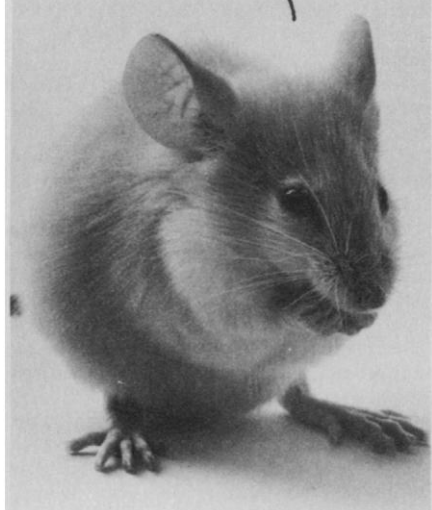
G. Teleki, E. Hunt, and J. Pfifferling of the University of Pennsylvania report that chimpanzees of Gombe National Park in Tanzania give birth on an average of once every 5.6 years. A consequence of this birth-spacing is that every female must live about 20 years in order for the population size to be stable. Old World monkeys, on the other hand, have life-spans roughly equal to those of the apes but have much shorter periods of infant and childhood development. Their average birth-spacings are 2 to 3 years. Most of the world is populated by monkeys rather than apes, Lovejoy points out, "even though apes are more intelligent."

Lovejoy speculates that the early hominoids gained a competitive advantage over other primates because they overcame this birth-spacing problem. He goes still further and says that more than the demography of the early hominoids was affected by this development. It may have led the hominoids to become bipedal, for example, in order to carry and care for several dependent offspring. Hominoids with several dependent offspring may have banded together and developed a social organization for mutual support and protection.

As always, anthropologists are hindered by a paucity of data when they try to formulate and evaluate their theories of human evolution. But as more and more Miocene hominoids are discovered, anthropologists are convinced that devising scenarios to explain evolution will lead them to a fuller understanding of the human past. Now that they are increasingly aware of the problem of developing preconceptions about what to expect from new finds, they believe the scenarios will be more useful. According to Glynn Isaac of the University of California at Berkeley, "Most people think that what is important is to have a series of alternative models that can be tested." As anthropologists begin to focus on the Miocene, such a series of models is being developed.

—GINA BARI KOLATA

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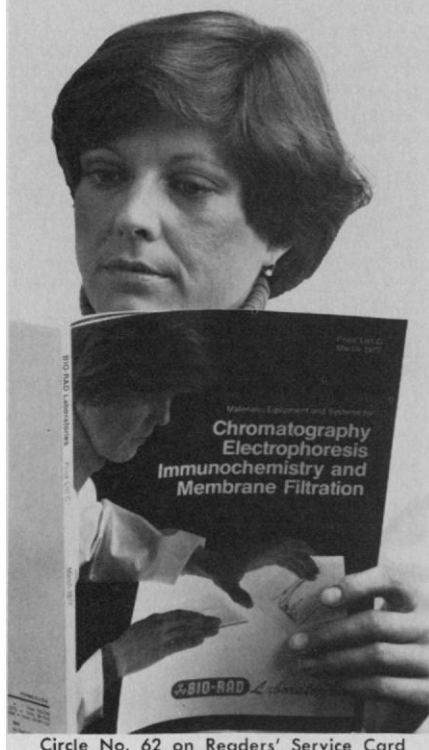
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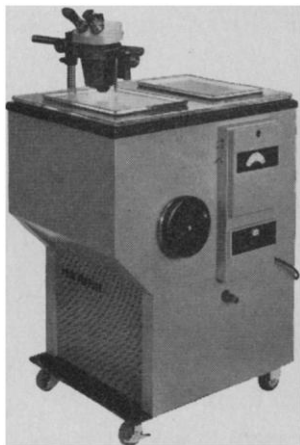
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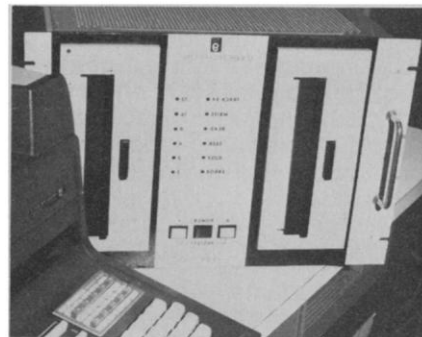
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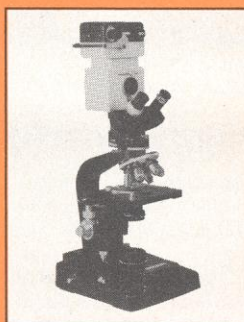
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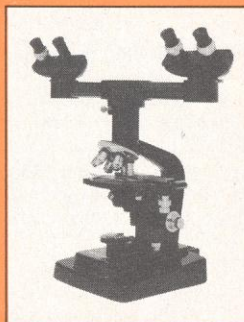
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