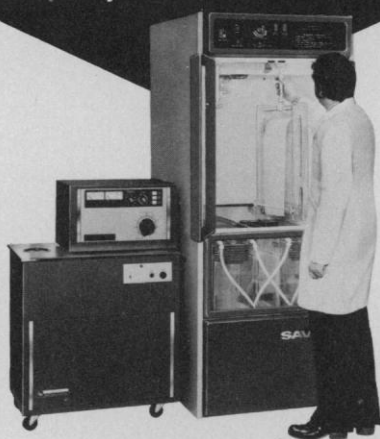


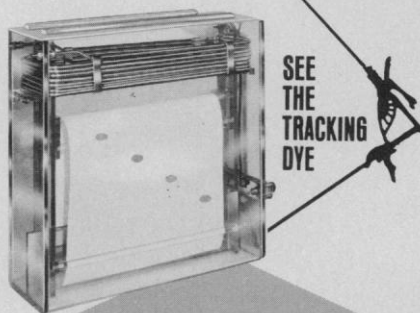
The world's most complete High Voltage Electrophoresis System ...and it's SAFE, TOO!



SAVANT'S HIGH VOLTAGE ELECTROPHORESIS ENCLOSURE WITH TWO LUCITE TANKS.

**A fully integrated ELECTRICAL and
FIRE PROTECTED chamber.**

- ☐ Fire Detection and CO₂ Extinguishing System.
- ☐ Audible Alarm and Remote Alert Signal.
- ☐ Electrical Interlocks for Primary and High Voltage Protection.
- ☐ Ground Fault Detection and Circuit Interruption.
- ☐ Flow-Thru Ventilation for Vapor Disposal.
- ☐ Cooling Water Flow Monitor and Visual Indicator.
- ☐ Unobstructed Visibility.
- ☐ Dimensions: 36" Wide x 39" Deep x 80" High.



Savant HVE Systems are "PROVEN"
in over one thousand laboratories
around the world. Request cat. #8036.

**Savant
Instruments, Inc.**
221 Park Avenue Hicksville, N.Y. 11801
(516) 935-8774

Circle No. 197 on Readers' Service Card

center are successfully coping with the variety of problems which are bound to develop in such a large pioneering project. In terms of the basic scientific value, scientific excellence, ethics, community and scientists' cooperation, administration, and fiscal prudence, MRFIT is maintaining successful progress toward its objectives.*

JOHN C. CASSEL

*Department of Epidemiology, School of
Public Health, University of
North Carolina, Chapel Hill 27515*

WILLIAM INSULL, JR.

*Center for Prevention of Premature
Arteriosclerosis, Rockefeller University,
New York 10021*

DAVID JENKINS

*Department of Behavioral Epidemiology,
School of Medicine, Boston University,
Boston 02118*

DONOVAN THOMPSON

*Department of Biostatistics,
School of Public Health,
University of Washington, Seattle 98105*

PARK W. WILLIS, III

*Section of Cardiology, School of
Medicine, University of Michigan,
Ann Arbor 48104*

CHARLOTTE M. YOUNG

*Cornell University, Ithaca,
New York 14850*

*The undersigned are nonfederal scientists who comprise the MRFIT Policy Advisory Board.

Health Statistics

Horacio Fabrega's article, "The need for an ethnomedical science" (19 Sept. 1975, p. 969) and the comments by Bergner *et al.* (Letters, 9 Jan., p. 26) were indeed timely. This year's AAAS annual meeting included a symposium, Health Status Indexes—Their Role in Tomorrow, which addressed the same issues. Information was presented about the current applications of health indicators, such as morbidity and mortality, within the social indicator framework. Discussion focused on the methodology of measuring positive aspects of health, with implications for developing health indexes for policy purposes.

Measures of health are now becoming sufficiently developed to assist in the decision-making process. Various research efforts during the last 50 years have produced significant literature published in a variety of respected professional journals on the development of measurable concepts of health and disease. Much of this research has been supported by the U.S. federal health establishment, as well as by the United Nations and the World Health Organization.

To coordinate the dissemination of this information and to encourage communication and cooperation among health status researchers, the National Center for Health Statistics, Department of Health, Education, and Welfare, has established the Clearinghouse on Health Indexes. The Clearinghouse prepares annotated bibliographies of current information related to health measurement and generates bibliographies on specific subjects. These services are available without charge.

PENNIFER ERICKSON

*Division of Analysis,
Clearinghouse on Health Indexes,
National Center for Health Statistics,
Rockville, Maryland 20852*

Climate Research

Among the host of warnings of environmental degradation now facing the public is the claim that disaster is in store if mankind fails to realize that his well-being depends on a stable global climate and that climatic change, either natural or man-made, is a real threat which must be attended to today.

As is true in the case of many environmental advocacy causes, some claims are gross exaggerations, thereby lending less credibility to the remainder. In addition, due in large measure to the degree of ignorance regarding the fundamentals of the nature of climatic variability and change, disagreements among climate experts concerning the plausibility of possible traumatic effects of climatic change have caused confusion on the part of the lay-public and within government circles, making it difficult to assess the true state of affairs.

However, these circumstances are hardly sufficient to account for the lack of federal funding of climate research in response, not just to the clamor of the doomsday prophets, but also to a series of highly authoritative and respectable reports (1), all of which have reiterated the need for a major increase in climate research activities. No doubt the demise last spring of the National Climate Program (2) can in part be ascribed to the nation's economic difficulties, but there is another more trenchant cause for the problem, specifically a failure to demonstrate to funders of such research the practical benefits that can result within a time frame of relevance to their mandate. For example, at its most ambitious, climate research would generate untold benefits if it could lead to a predictive capability; at present, however, this is more a hope than an expectation. Research funding with such an objective would be long-term, high-risk, and have a

Isn't Your Work Too Important ... For Anything But The Best?



Product safety is our prime consideration. When Forma Scientific builds a biological storage freezer, we start with a heavy-duty steel cabinet bonded to an embossed aluminum liner with a minimum 5" foamed-in-place urethane insulation. With this superior quality construction and high-performance refrigeration system our cabinet temperatures of -75°C and -90°C are guaranteed in a very warm $+85^{\circ}\text{F}$ ambient. And overall temperature control and uniformity is the best. *No other manufacturer can match that guarantee!*

The dependable safety alarm system with life-time self-charging nickel cadmium batteries is standard. Forma's easily interchangeable liquid CO_2 and LN_2 automatic back-up systems are designed to meet OSHA requirements.

Forma Biological Storage Freezers. Available in low-profile 12 and 20 cu. ft. chest and space-saving 13 cu. ft. upright models. Temperatures to -75°C and -90°C . From Forma . . . the Freezer People.



Forma Scientific

BOX 649 • MARIETTA, OHIO 45750 • AREA CODE 614/373-4763
TELEX 24-5394 • TOLL FREE IN-WATS SERVICE 800-848-9730 AREAS 1, 2 & 3

Circle No. 14 on Readers' Service Card

high payoff. A conservative program would emphasize the collection and analysis of more data on climate the world over. Such knowledge would be of interest to planners in climate-sensitive sectors of the economy, for example, in determining the magnitude of buffer stocks of food. This type of research is easy to justify in terms of short-term goals but has attracted little attention from the research community, presumably because of its relatively mundane scientific content. Finally, there remains the very real possibility of an eventual man-made disturbance of the world's climate through any one of a variety of mechanisms, most of which were reviewed in the Study of Man's Impact on Climate report (3). The Climatic Impact Assessment Program (4), based on one such possibility, was in fact funded but ended without gaining the advances needed to predict the climatic consequences of a reduced ozone layer—its stated objective. Other man-induced impacts have been judged potentially serious, but far off, and thus those investigating them have not been able to compete for restricted research funds.

Within the last few months, new information has come to light: there is now a demonstrable case of a man-made global climatic change whose magnitude depends on planning decisions made today but which cannot be quantitatively assessed because of our ignorance of the dynamics of the climate system. The increase in global atmospheric carbon dioxide since the start of this century is well documented and the first-order climatic response well known (the "greenhouse" effect). Best estimates suggest an increase in global mean temperature of perhaps 2°C , with a doubling of ambient CO_2 levels above their preindustrial value (5), but reliable estimates are far from possible at present, due, not only to a lack of understanding of atmospheric dynamics, but to a wide variety of feedback mechanisms within the climate system that need to be investigated and taken into account. The latter, it should be pointed out, can result in diminution or enhancement of the climatic response (6). Projections have also been made of expected levels of atmospheric CO_2 by extrapolation of present-day trends of industrial generation. The recent report by Broecker (7) estimates a 50 percent increase by the year 2020, a figure that agrees with that used by Häfele and Sassin in an important new study (8) made for the International Institute for Applied Systems Analysis (IIASA). They assume a fully fossil-fuel energy production system for the world well into the next century (that is, insignificant nuclear or other forms of energy production) and report a date of 2035 for a doubling of the ambient CO_2 level. They also assume a 3 percent

energy growth rate for the world with an ultimate leveling off at 5 kilowatts per capita using 1974 U.N. population projection figures. The crucial new consideration introduced in the IIASA study is the juxtaposition of this fact with an assessment of our ability to massively deploy a new energy production technology. It points out that the "market penetration time" (that is, the time for a new energy production system to gain a 50 percent share of the total market, starting from a 1 percent level) is 60 years in the case of the United States and longer for the rest of the world. Moreover, this number appears to be an indigenous property of the economic forces that drive the market system and is difficult, if not impossible, to reduce materially. Thus, it so happens that the market penetration time just matches our current best estimate of the CO₂ doubling time, and if planning decisions for avoidance of possible CO₂ climatic impacts are to be effective, the time to make them appears to be now.

If the nation's energy planners take their public charge seriously, it is evident from these fundamental considerations that they should be pressing for assured predictions of the climatic consequences of their decisions on energy production deployment, as error could be disastrous. Understanding climatic change is a truly massive task; social responsibility dictates that we get on with the job diligently and expeditiously.

J. A. LAURMANN

3372 Martin Road,
Carmel, California 93921

References and Notes

1. Federal Council for Science and Technology, Interdepartmental Committee for Atmospheric Sciences, *Report of the Ad Hoc Panel on the Present Interglacial* (Government Printing Office, Washington, D.C., 1974); National Advisory Committee on Oceans and Atmosphere, *Third Annual Report* (Government Printing Office, Washington, D.C., 1974); U.S. Committee for the Global Atmospheric Research Program, *Understanding Climatic Change: A Program for Action* (National Academy of Sciences, Washington, D.C., 1974); Ocean Science Committee, *The Role of the Ocean in Predicting Climate* (National Academy of Sciences, Washington, D.C., 1975).
2. Environmental Resources Committee, Subcommittee on Climate Change, *A United States Climate Program* (Domestic Council, Washington, D.C., 1974).
3. *Inadvertent Climate Modification: Report of the Study of Man's Impact on Climate* (MIT Press, Cambridge, Mass., 1971).
4. A. J. Grobecker, S. C. Coroniti, R. H. Cannon, Jr., *The Effects of Stratospheric Pollution by Aircraft. Report of Findings* (National Technical Information Service, Springfield, Va., 1974).
5. S. H. Schneider and R. D. Dennett, *Ambio* 4, 65 (1975).
6. There are, of course, other possible man-made as well as natural causes of climatic change. Particulates from industrialization have until recently been thought to reduce global temperature. This is no longer believed to be necessarily the case [see S. H. Schneider and C. Mass, *Science* 190, 741 (1975)].
7. W. S. Broecker, *ibid.* 189, 460 (1975). Broecker also makes estimates of global temperature response allowing for projected natural climate change, an important consideration in predicting increased global temperatures.
8. W. Häfele and W. Sassin, "Energy strategies", paper presented at the European Physical Society Annual Meeting, Bucharest, 1975.

clean living

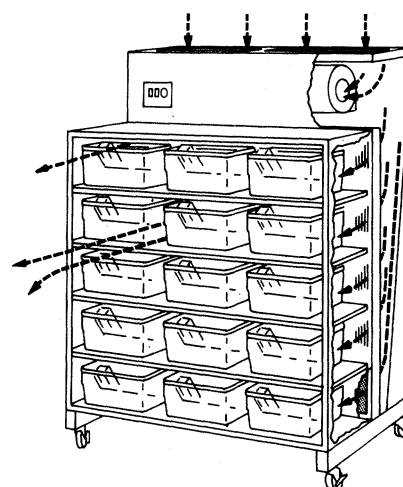


Laminar air flow is a technique which significantly reduces concentrations of airborne contamination in your animal breeding or research area.

Our laminar system, called **stay-clean®**, filters air at the source, and the velocity of the air—directed outward over the cages—carries away enclosure generated airborne contamination and also prevents entry of other contaminants.

Air flow from the **stay-clean** system is filtered to remove particles of 0.3 microns or larger. Air velocity is adjustable from 50 ft. per minute to 90 ft. per minute.

The **stay-clean** system is completely self-contained, easy to operate and requires little or no maintenance. The roll-around system is constructed of Type 316 stainless steel and is equipped with adjustable shelves so that a variety of cage sizes can be accommodated.



For complete details, prices and delivery, please write or call, Lab Products, Inc., 635 Midland Avenue, Garfield, New Jersey 07026. Phone (201) 478-2535.

lab products inc
a BioMedic company