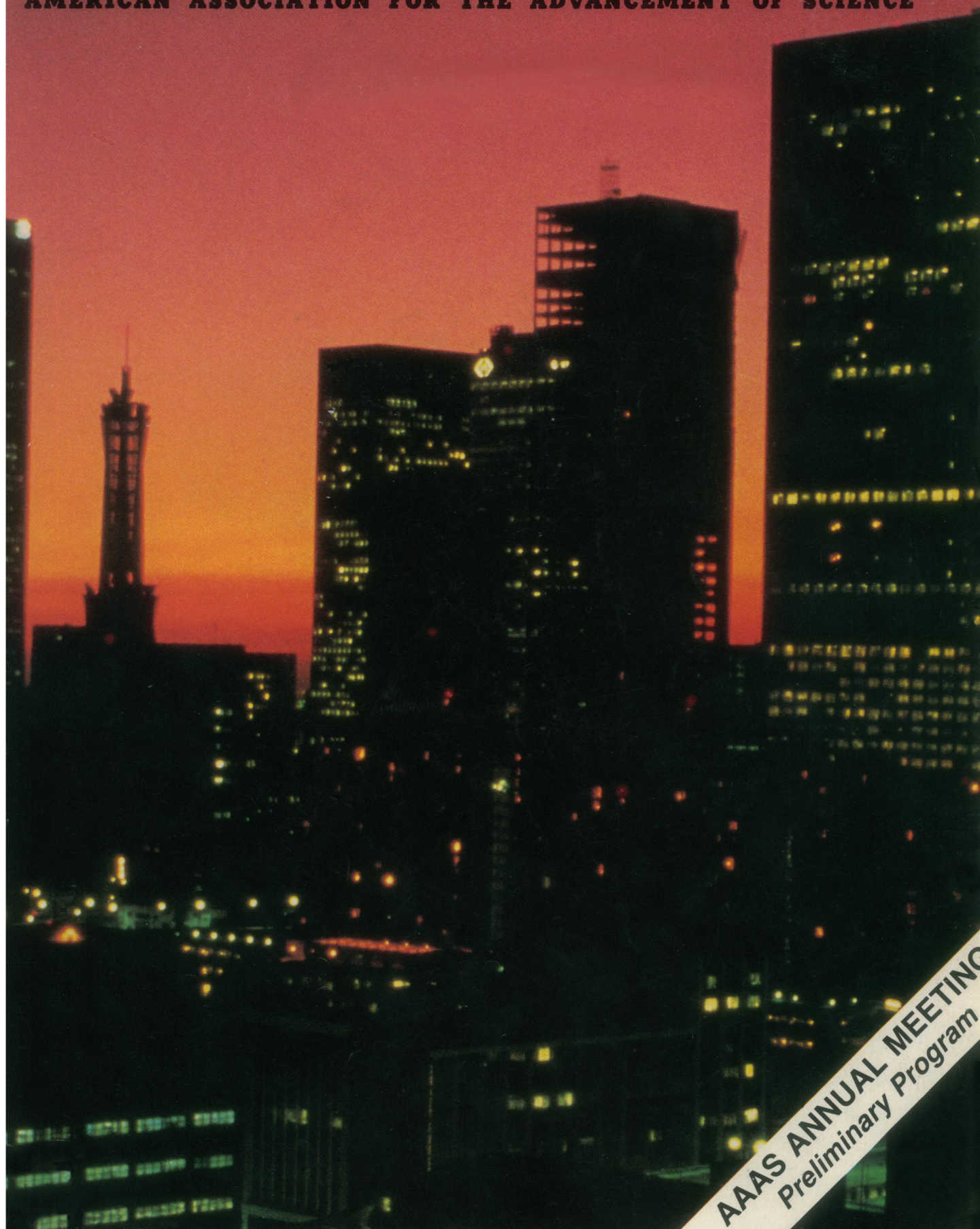


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Skyline of Los Angeles, California, site of the AAAS Annual Meeting, 26-31 May 1985. See page 1207 for preliminary program. [Photo courtesy of Greater Los Angeles Visitors and Convention Bureau, Los Angeles, California 90071]

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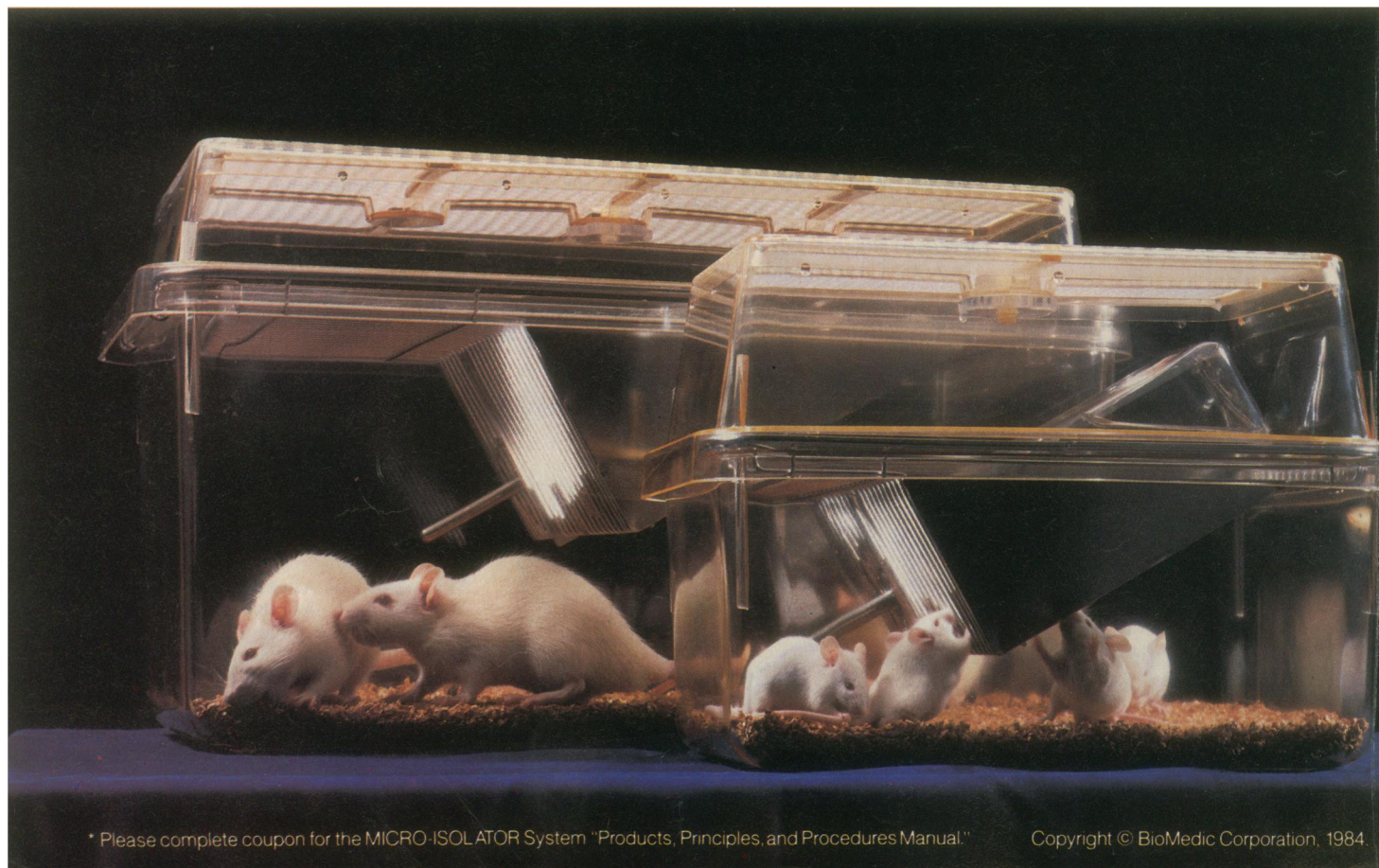
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Patents applied for on the MICRO-ISOLATOR units and other elements of the complete system.

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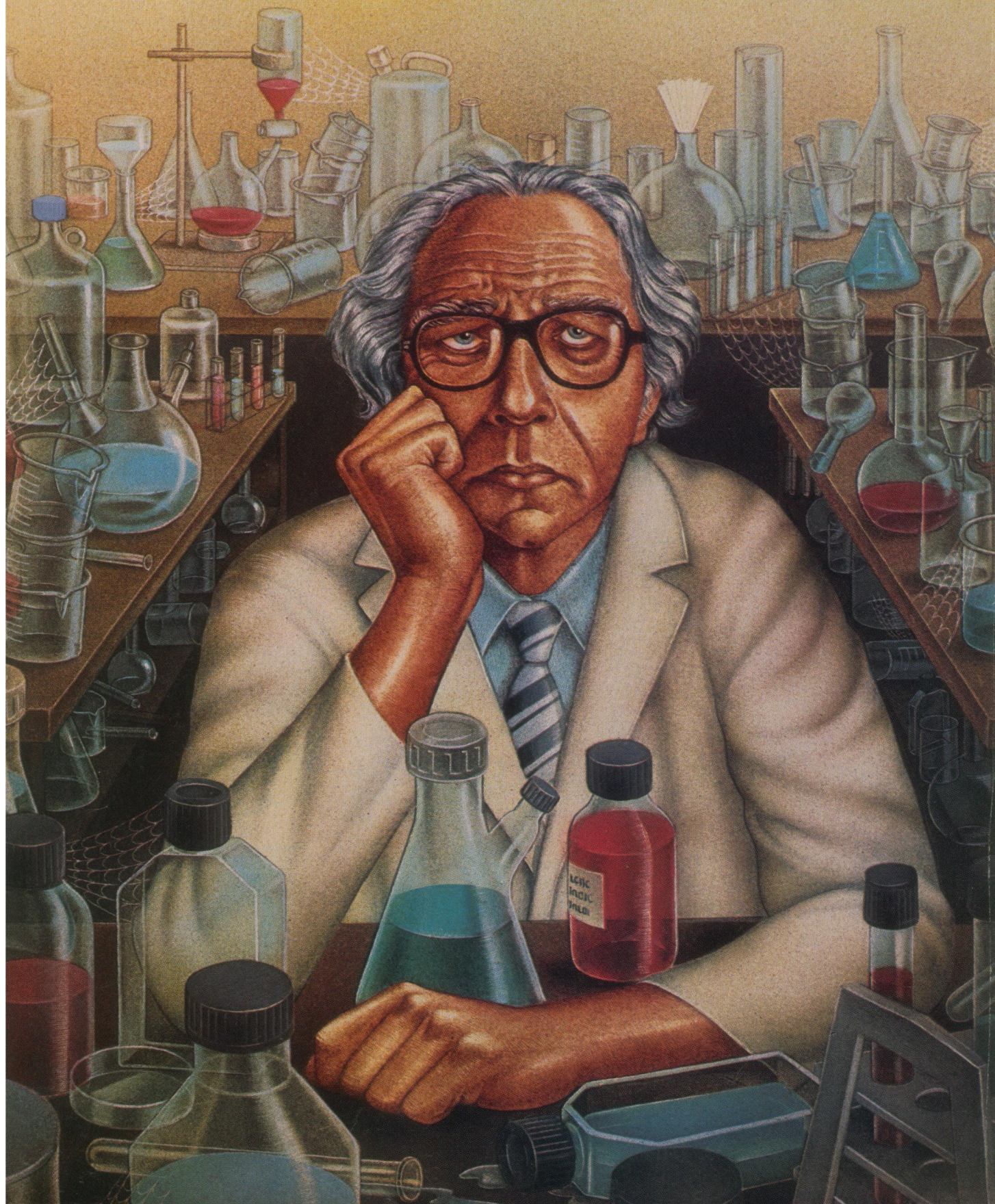
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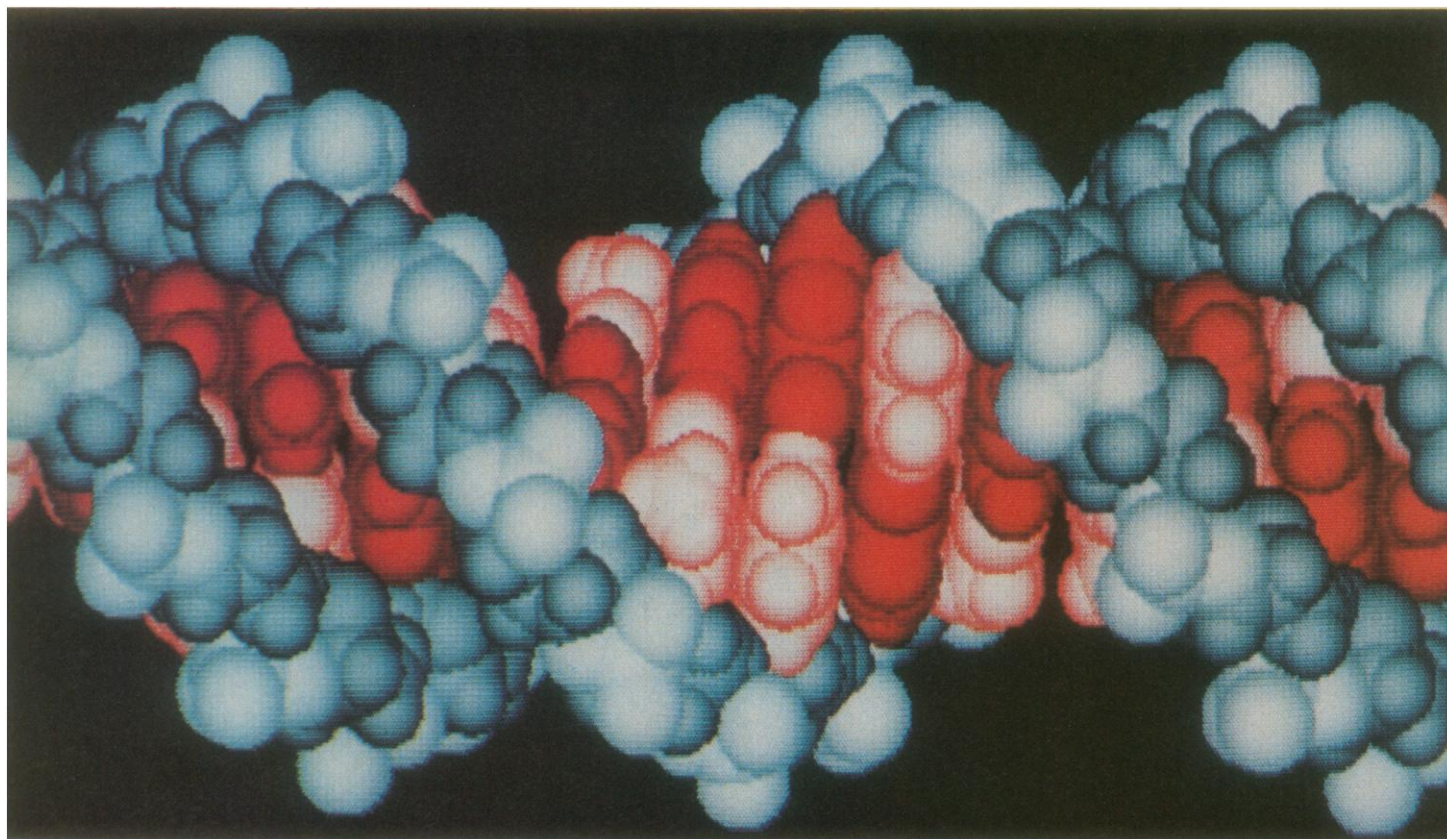
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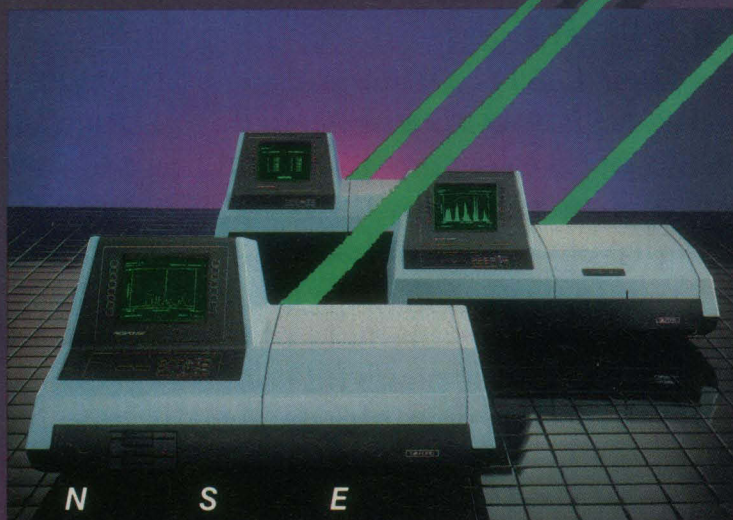
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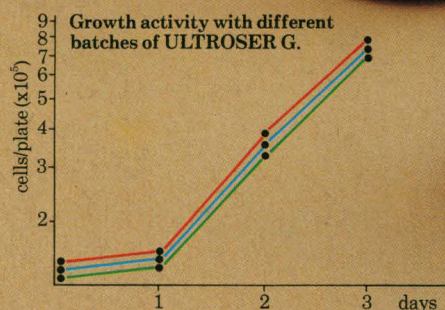
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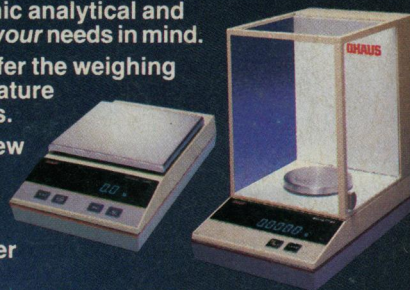
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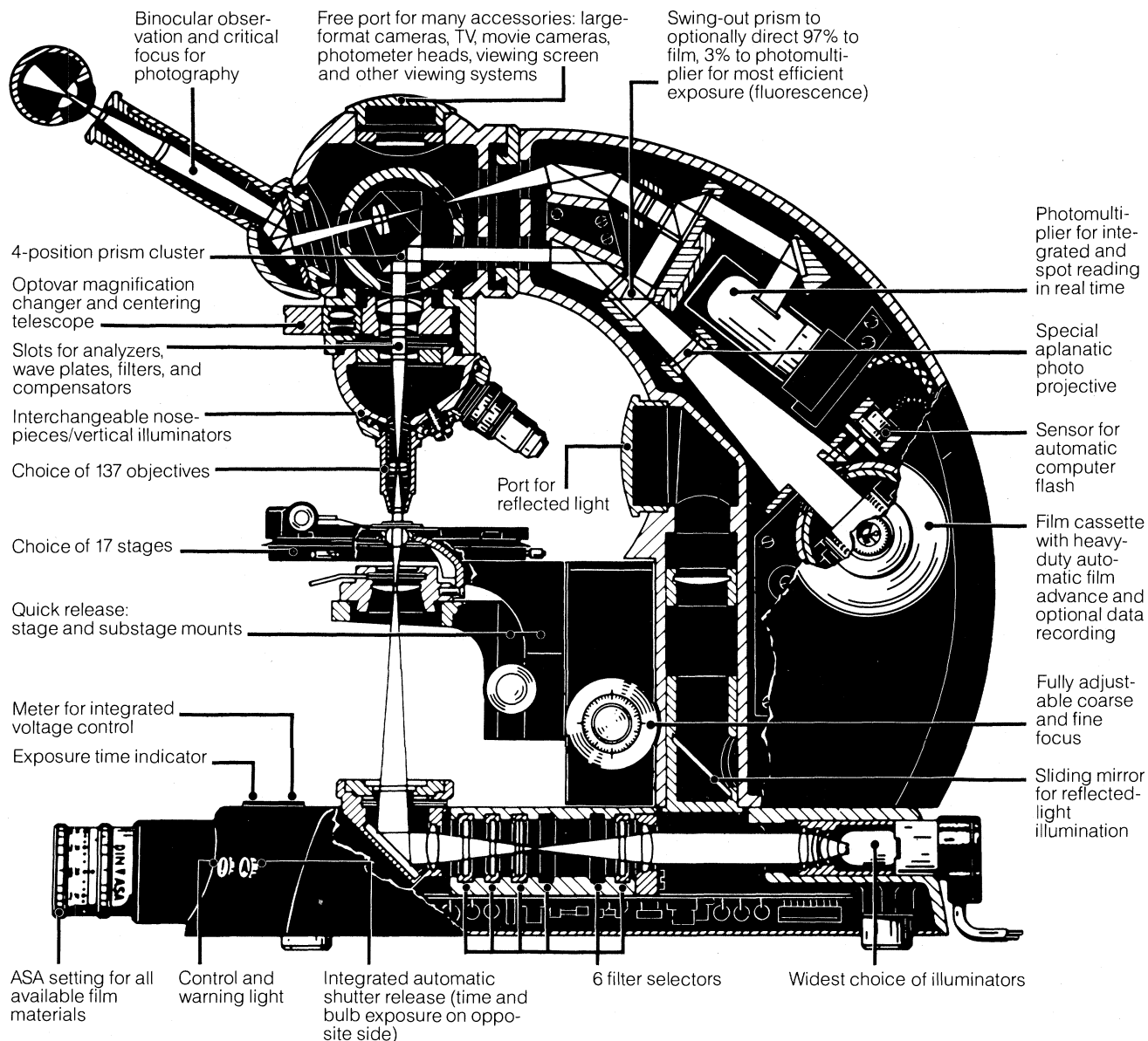
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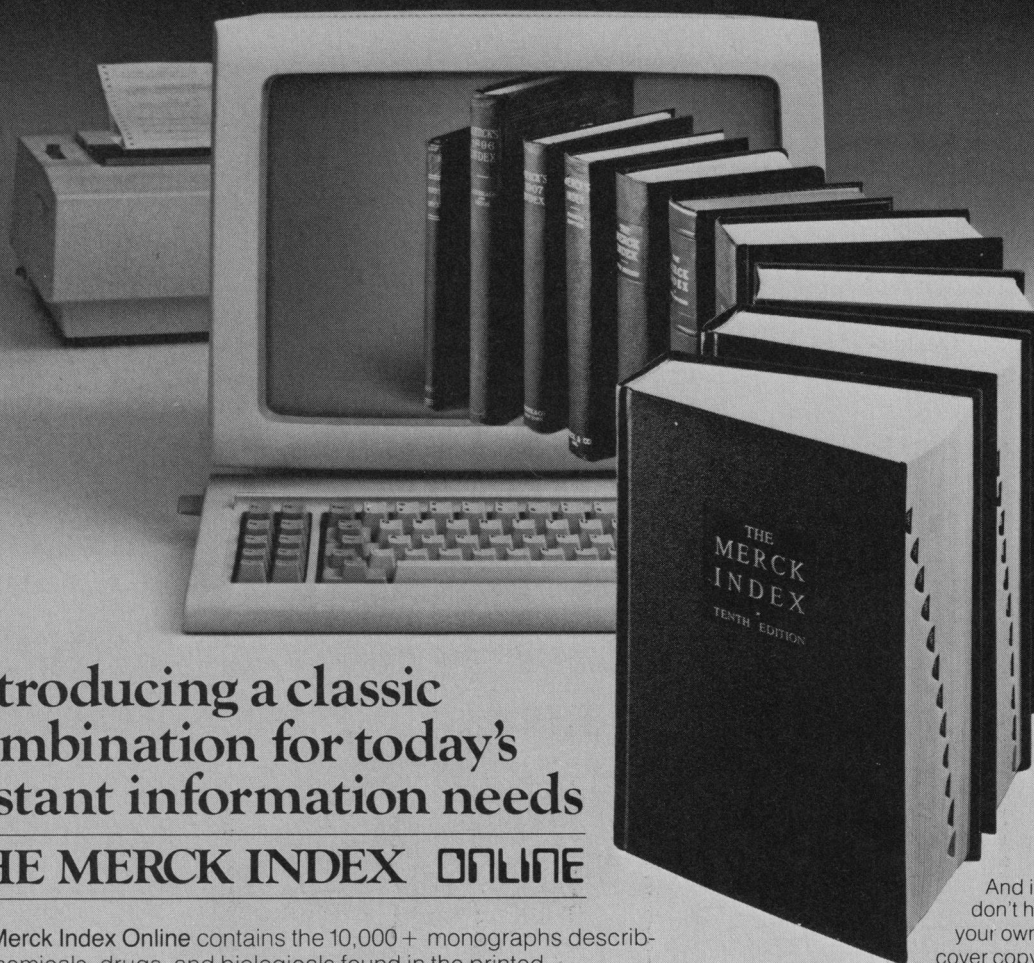
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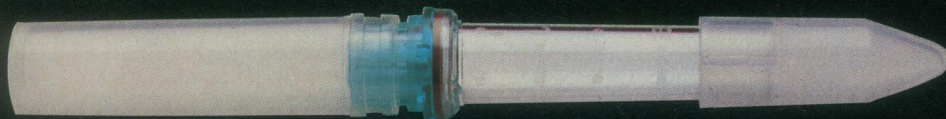
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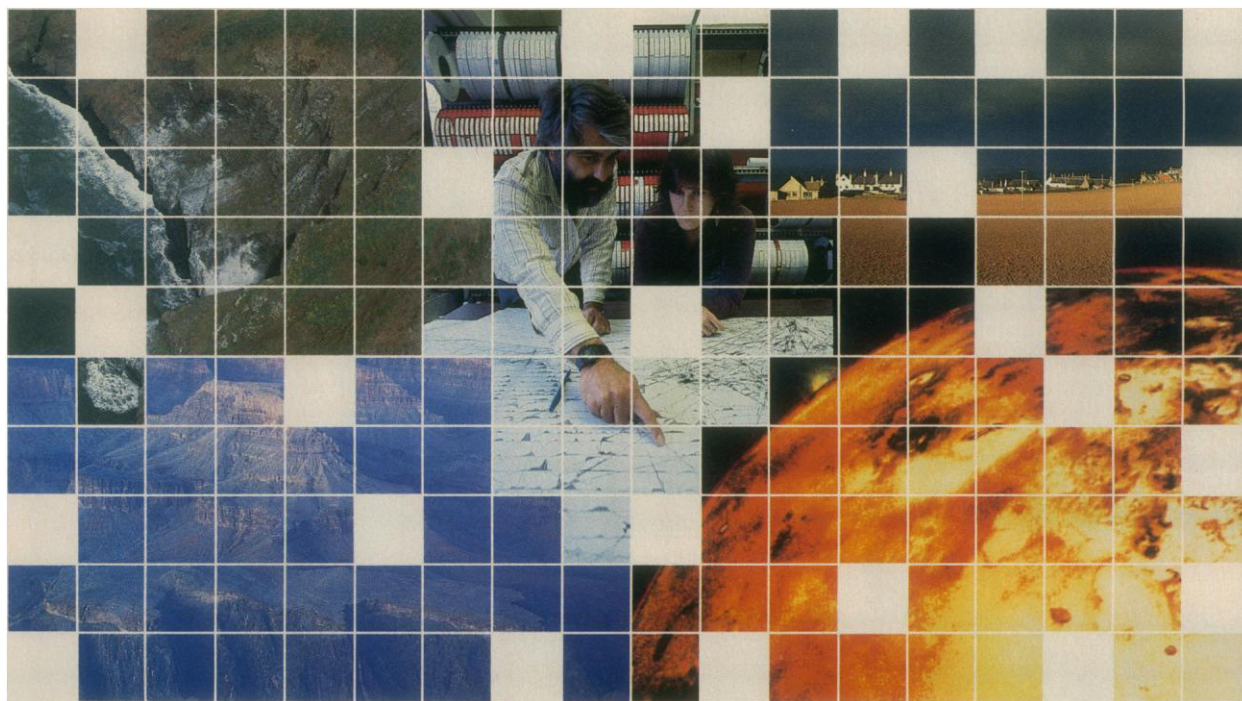
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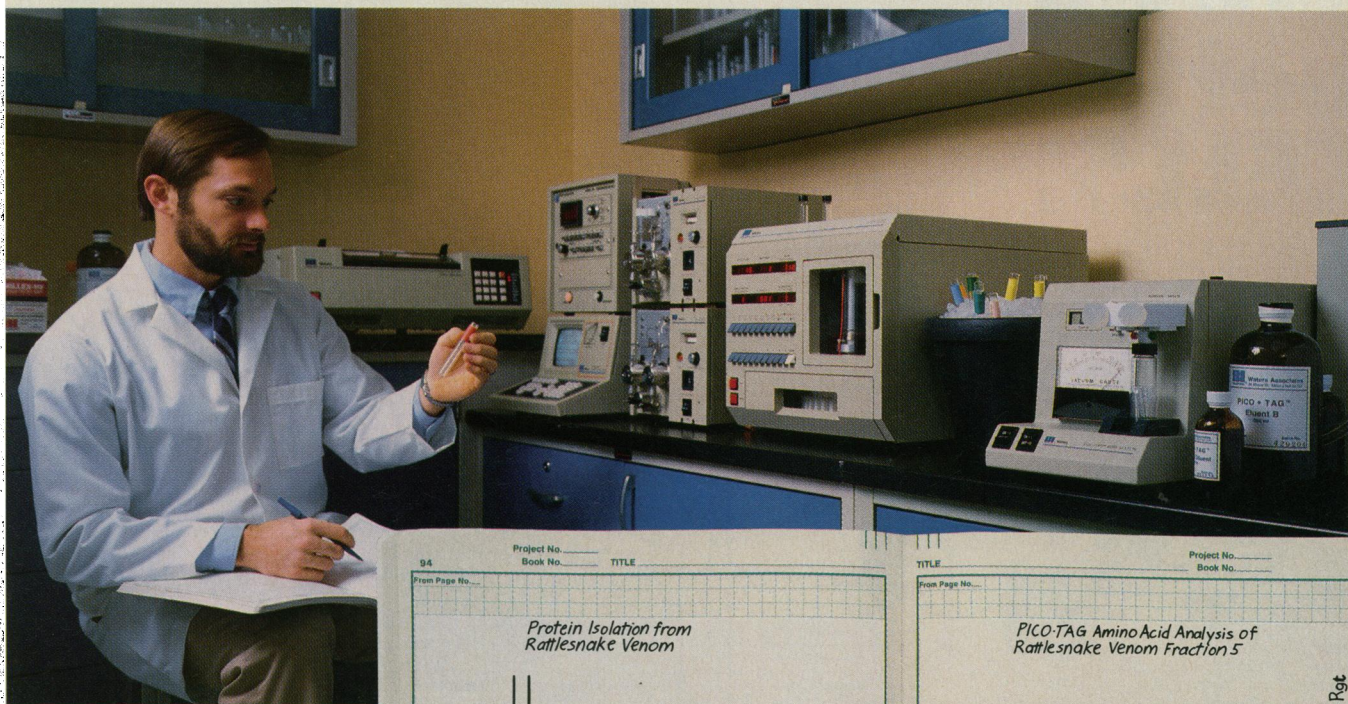


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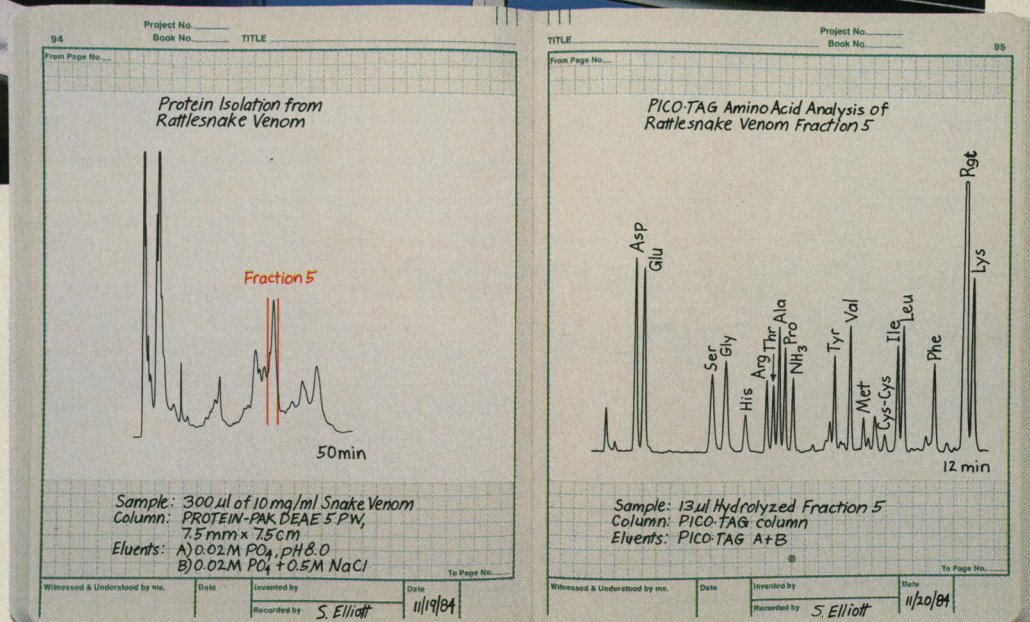


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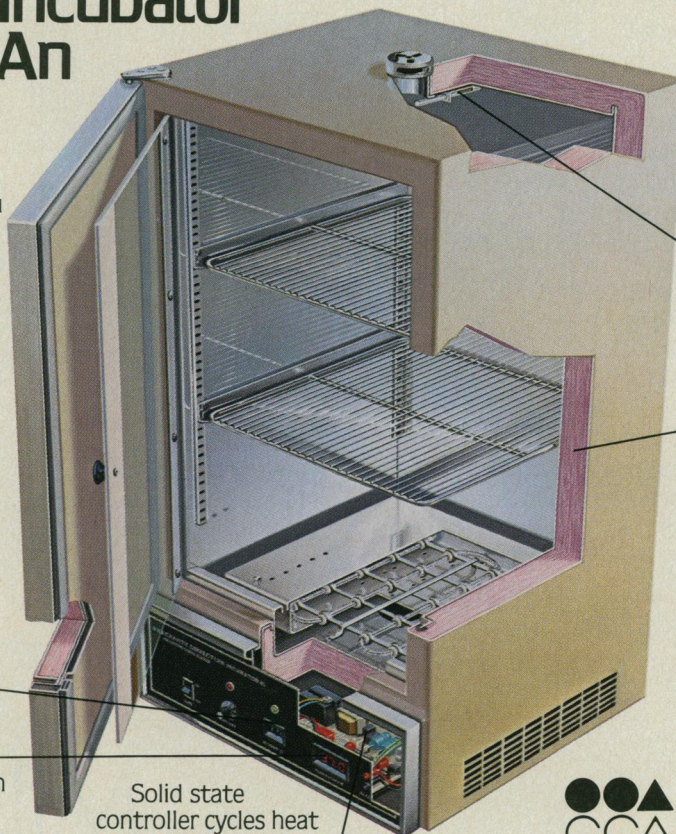
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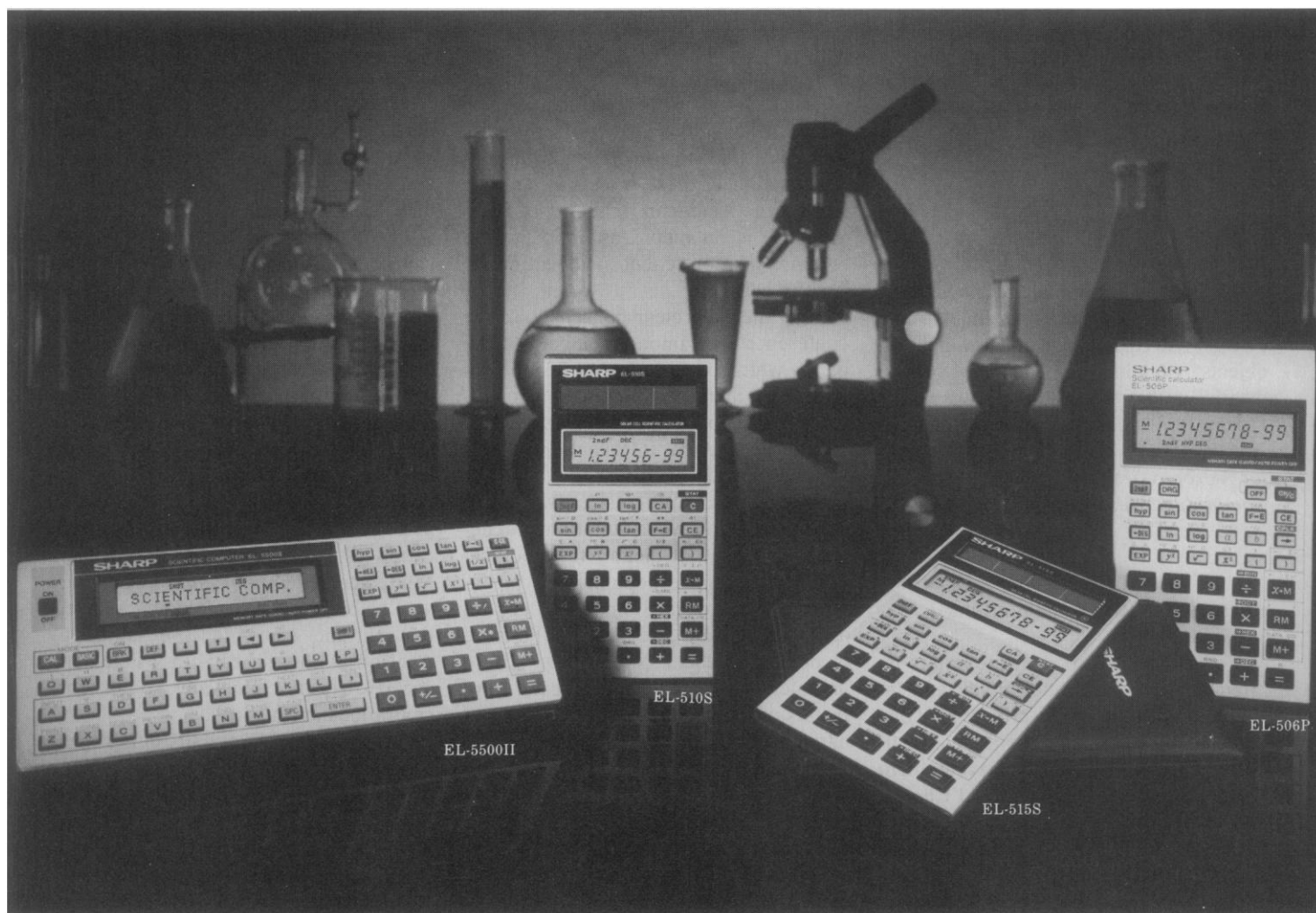


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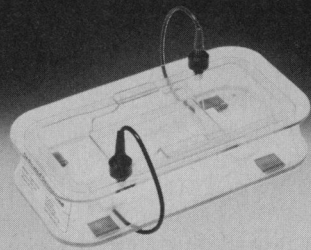
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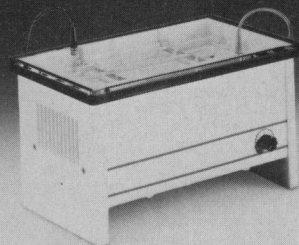
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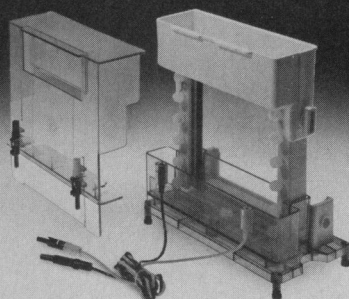
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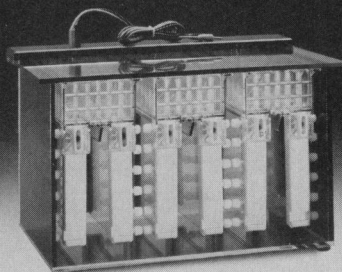
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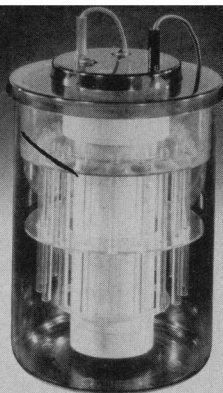
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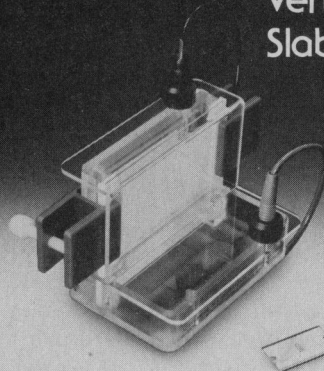
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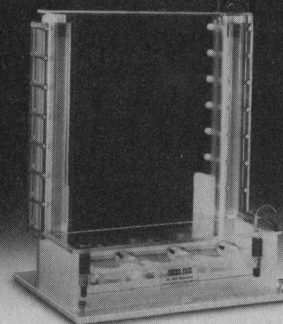
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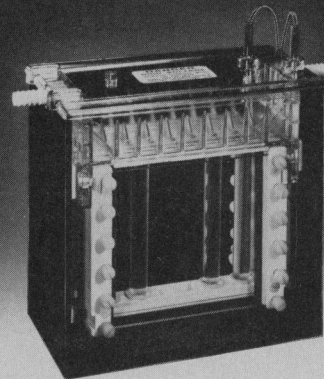
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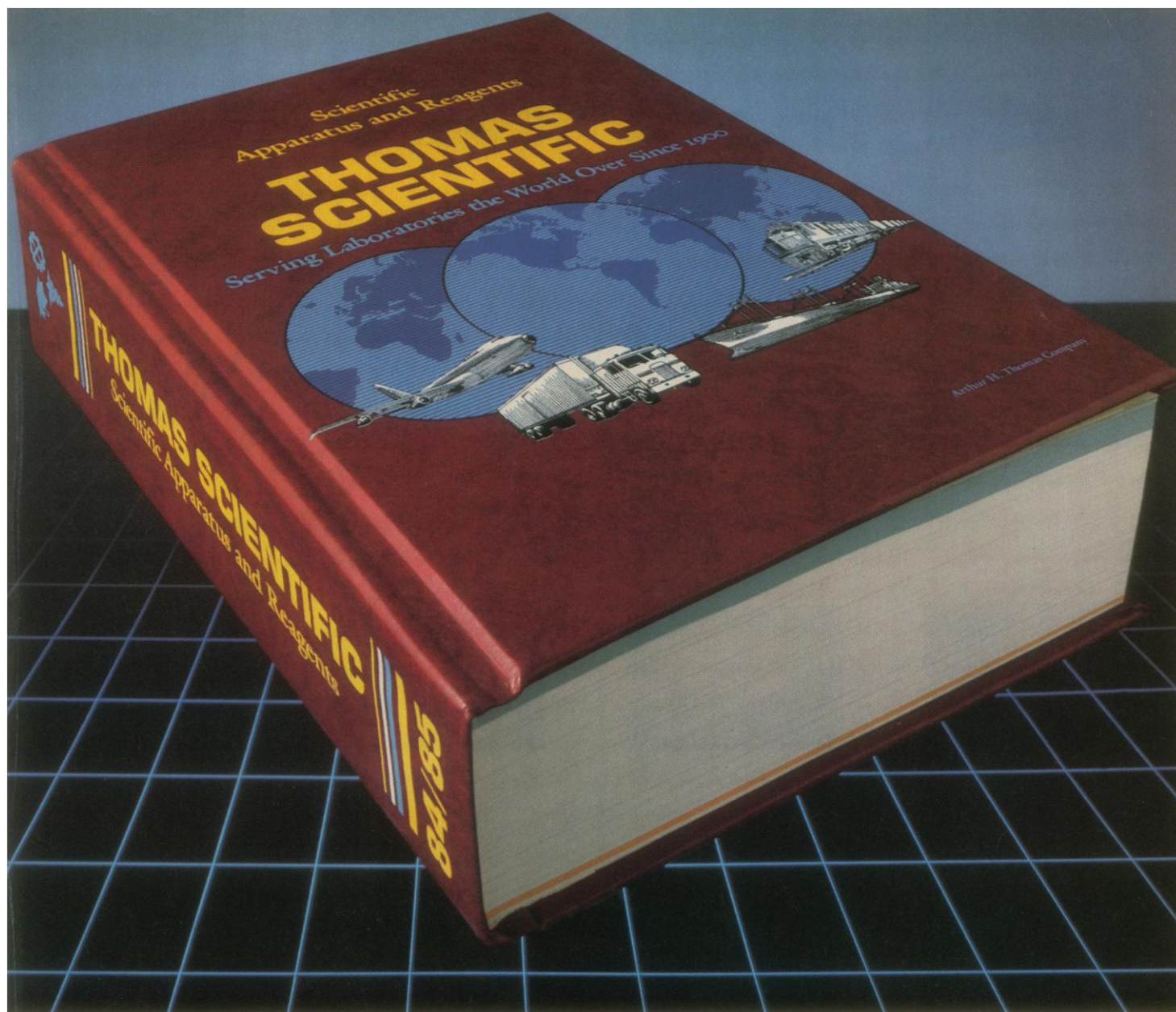
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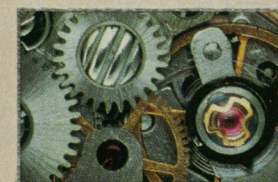
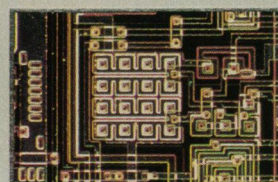
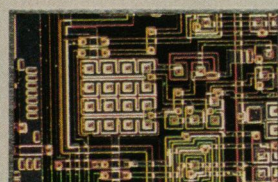
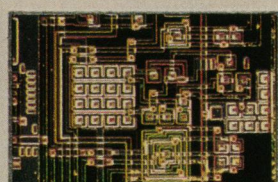
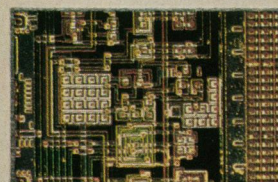
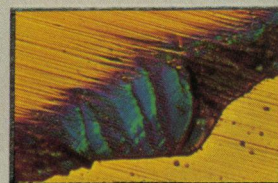
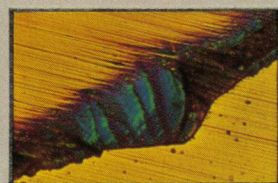
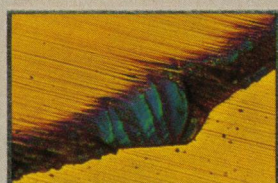
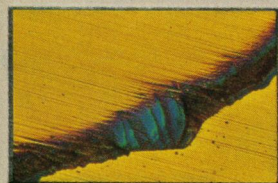
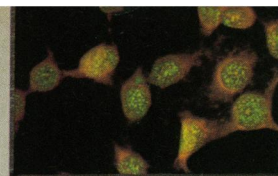
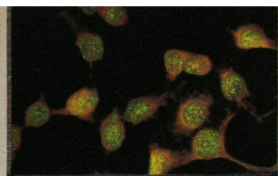
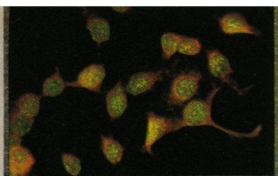
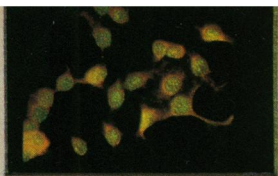
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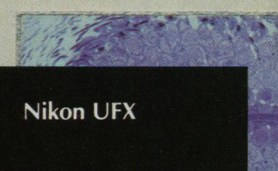
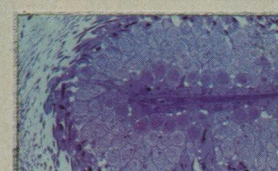
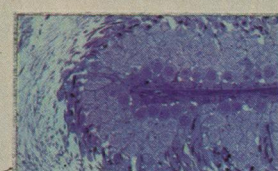
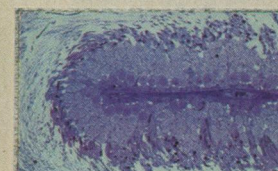
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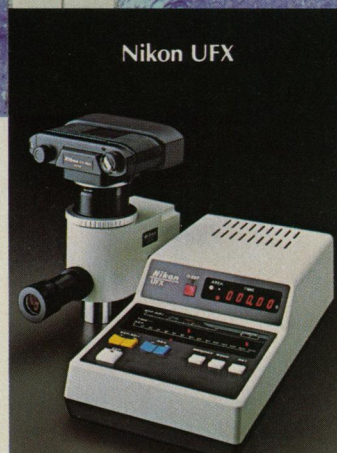
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For some months, media coverage has focused the world's attention on the human tragedy striking Ethiopia and seven other African countries. Millions of people are hungry, hundreds of thousands are starving, and thousands have already died. As individuals and as a nation, we are responding. Since 1 October 1984, the Agency for International Development has approved more than 1.9 million metric tons of food aid for Africa, valued at about \$603 million. In addition, food and on-the-ground support have come from more than 120 private voluntary and church organizations.

Although the current drought is being blamed for the immediate crisis, several underlying causes are responsible for Africa's continuing food deficits. Per capita food production in sub-Saharan Africa has declined during the past several years, even though overall food production has remained level or even increased slightly.

Said to be contributing factors are high population increases, short-sighted government policies that discourage farmer productivity, poor transportation facilities, and civil strife. But a major factor is a shortage of yield-increasing technologies, such as those that stimulated the Green Revolution of Asia and Latin America. The variety of climatic and ecological conditions facing African agriculture demands an equally varied mix of improved technologies. So far, few are yet available.

It would be unfair to imply that nothing has been done to develop improved food-producing technologies. For several years, support for agricultural research in Africa has been a primary pillar of AID's development assistance program. AID has funded national and regional research programs, as well as the international agricultural research systems that produced the Green Revolution's high-yielding wheats, rices, and maize. AID also supports cooperation between U.S. universities and counterparts in Africa through the Collaborative Research Support Programs (CRSP); these deal with sorghum and millet, beans and cowpeas, peanuts, small ruminants, nutrition, and tropical soils. Total U.S. support for agricultural research in Africa rose to \$85 million in 1984.

These efforts are already showing results. For example, a drought-tolerant sorghum variety recently introduced in the Sudan produces yields that are twice those of traditional varieties. New cowpea varieties, with short growing seasons, drought tolerance, and resistance to virus and bacterial diseases, have been developed at the International Institute for Tropical Agriculture in Nigeria. A disease-resistant cassava, with three times the yield of native strains, has also been developed at the institute. In Kenya and Zimbabwe, hybrid maize varieties have been adopted widely by small farmers. Native cattle tolerant to the dreaded sleeping sickness have been discovered, and this tolerance is being bred into susceptible native stock by the International Livestock Center for Africa and the International Laboratory for Research on Animal Diseases.

This is just the beginning. To give Africa the tools to meet her food needs will require the best that science can offer worldwide. Biotechnology techniques such as cell and tissue culture can be used immediately to accelerate the production of drought-tolerant and disease-resistant crop varieties. Embryo transplantation offers the possibility of rapidly developing and introducing improved livestock species. In the future, recombinant DNA technology may be appropriate.

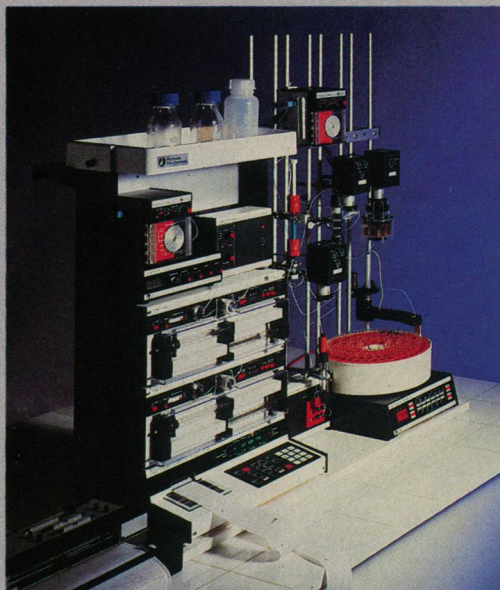
The current tragedy in Africa has created a climate of concern for long-term solutions beyond emergency relief. Sustained commitment to agricultural research is crucial if we hope to remove the specter of famine in the future.—N. C. BRADY, *Senior Assistant Administrator for Science and Technology, Agency for International Development, Washington, D.C.*

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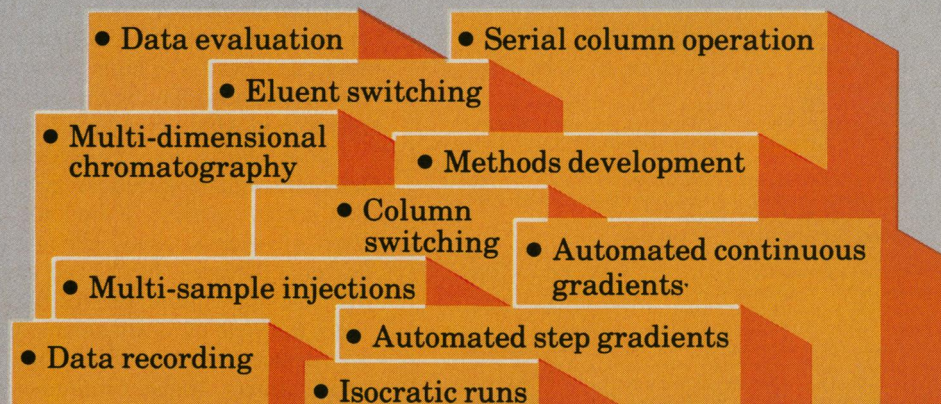


buffer solutions and organic solvents may be used for separating biological molecules while maintaining biological activity.

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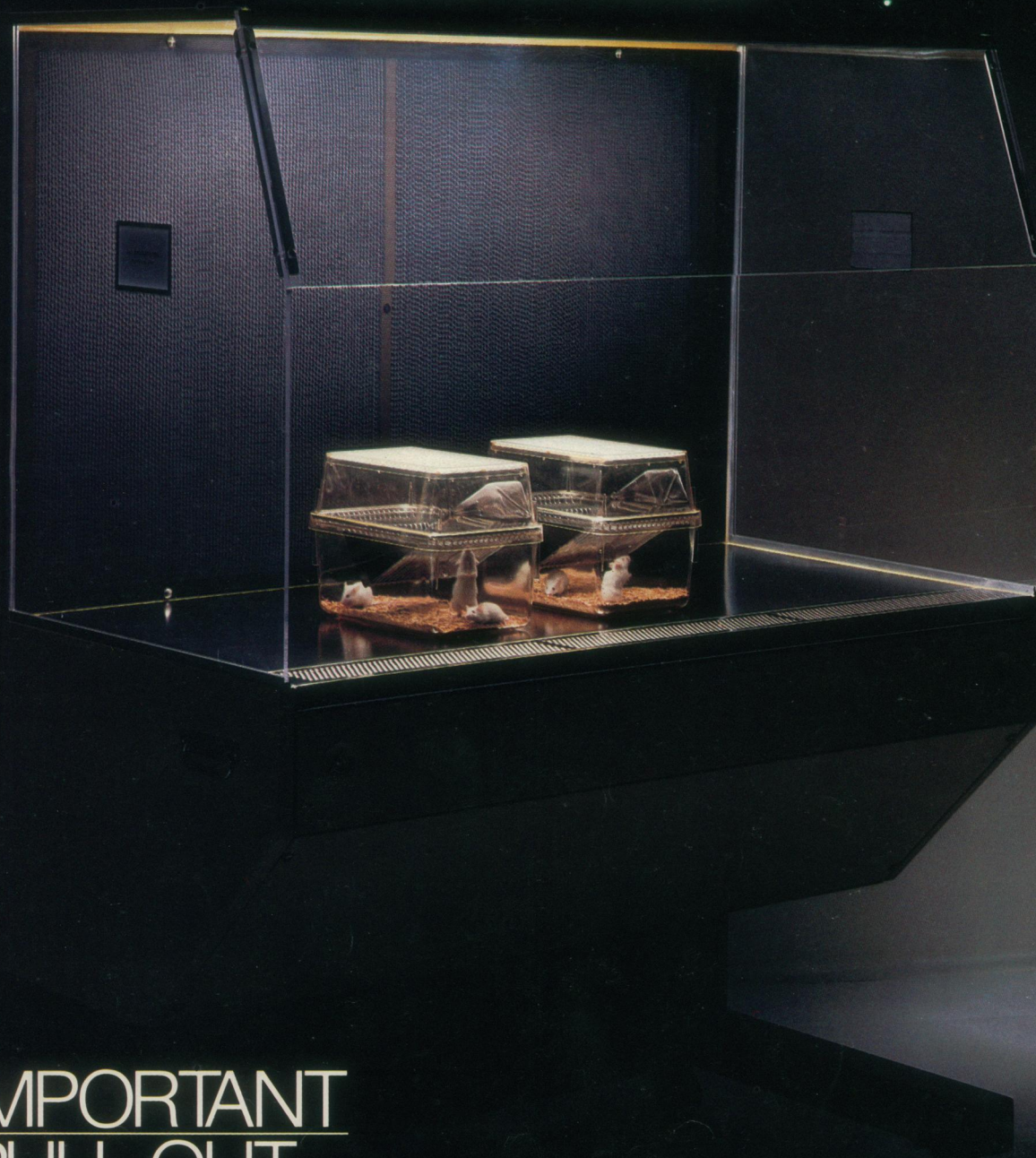
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The MICRO-ISOLATOR™ System

A simple and versatile animal housing system that offers greater microbiological control than complex barrier rooms ... but without the inconvenience and inefficiency that barrier rooms impose by limiting the movement of people and animals.

Products, Principles & Procedures Manual



IMPORTANT
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Patents have been applied for on the MICRO-ISOLATOR Units and other elements of the complete MICRO-ISOLATOR System.

Introduction

The MICRO-ISOLATOR System is a simple alternative to the complex barrier room system.

Barrier rooms are undesirable for many reasons. Almost without exception, they *eventually* fail to protect the animals they house from exogenous contagion from other lab animals and, in *every* instance, they *immediately* fail to protect the animals from people. As soon as animals are introduced into barrier rooms, they become colonized with numerous microorganisms from caretakers and/or investigators. These microbial agents often render the animals useless for research purposes, e.g., the most common opportunistic pathogen that people carry into barrier facilities is *Pseudomonas*, which interferes with radiation research by killing mice following whole body irradiation. People are also capable of contaminating barrier room animals with *Salmonella*, pneumococci, *Hymenolepis nana* (the dwarf tape worm of man), lymphocytic choriomeningitis virus, reovirus 3, *Mycobacterium tuberculosis*, *Citrobacter freundii*, staphylococci (that can cause peri-orbital lesions in nude mice), *Pasteurella*, *Proteus*, *Campylobacter*, etc.

The MICRO-ISOLATOR System protects animals from becoming contaminated via other lab animals or people by placing the barrier at cage level and never allowing that barrier to be opened *except* in a protected, Class 100 environment (LAF workbench) by personnel whose pertinent body surfaces (hands, wrists, and arms) are covered and decontaminated with a sterilant. Personnel then practice aseptic technique during *all* manipulations. The MICRO-ISOLATOR Unit is analogous to a "giant Petri dish" which, following manipulation in the Class 100 workbench, can be removed and placed on a standard animal rack until the next manipulation is necessary.

Barrier rooms are also undesirable because they impose the inconvenience of requiring personnel to shower prior to entering and prohibit the movement of animals from one room to another. In addition, barrier rooms are especially vulnerable when ancillary environmental equipment fails. Air conditioning units periodically break down causing a temporary lack of positive pressure and, in some instances, doors have to be opened to allow cooler air to enter, thereby further breaking the integrity of the system.

In the MICRO-ISOLATOR System, since the barrier is at cage level, racks of cages and the LAF workbench can easily be rolled to an alternative room for housing and continued use without interfering with the integrity of the system. As with barrier rooms, however, the MICRO-ISOLATOR System requires an effective insect control program where the MICRO-ISOLATOR Units are housed. Also, as with Petri dishes, MICRO-ISOLATOR Housing Units should never be placed on the floor where the highest concentrations of dust and air turbulence occur.

The MICRO-ISOLATOR System is not only superior to the barrier room concept because it is less expensive, more convenient, and offers greater microbiological control, but also because each MICRO-ISOLATOR Unit functions as a *separate* giant Petri dish and therefore multiple species of animals can be housed in the same room! This is of enormous importance in facilities where space is at a premium and a variety of laboratory animals (mice, rats, hamsters, and/or guinea pigs) must be maintained on study.

Effective utilization of the MICRO-ISOLATOR System

Although the MICRO-ISOLATOR System is simple and effective, its basic principles must be understood and the appropriate protocols followed carefully and consistently. The integrity of the system must be protected at all times and every step of the procedure followed to the exact letter lest it become the "weak link" in the chain. As with any effective system, compliance with the appropriate operating techniques is vital and therefore shortcuts or technique inconsistencies must be avoided.

The elements of the complete MICRO-ISOLATOR System

The complete system consists of three units:

The MICRO-ISOLATOR Housing Unit

- Basic autoclavable plastic cage (sizes for mice, rats, hamsters, and guinea pigs)
- Stainless steel wire bar lid
- Autoclavable plastic filter top
- Usual accessories: water bottle, rubber stopper, stainless steel sipper tube

The STAY-CLEAN Laminar Flow Workbench

A compact, moveable, self-contained Class 100 environment for use with laboratory animals

The Service Cart

For carrying all necessary supplies to the laminar flow workbench for servicing the MICRO-ISOLATOR Housing Units

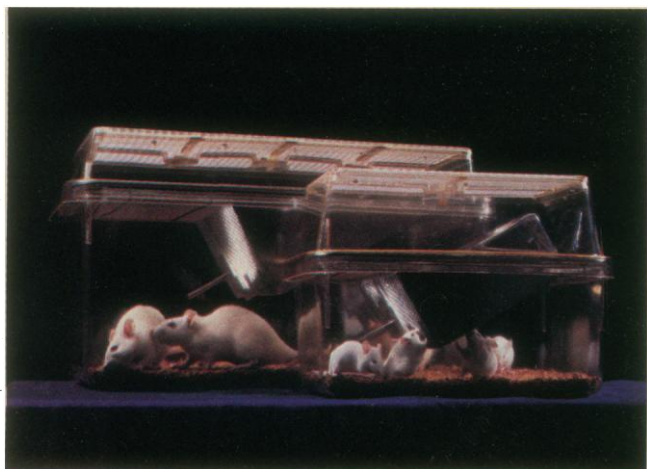
The MICRO-ISOLATOR Housing Unit

What's different about the MICRO-ISOLATOR Unit?

The MICRO-ISOLATOR Unit incorporates a *durable* filter top frame (that does not dislodge when cages are pushed against one another) *and* insists that the cage only be opened within a laminar air flow workbench that supplies Class 100 air while the operator practices aseptic technique. When not in the workstation, the MICRO-ISOLATOR Unit protects the animals it houses against contamination by relying upon a classic Petri dish-like effect, i.e., the top filter frame overlaps the cage bottom. This results in protection against microbial contamination while allowing for gaseous exchange.

What are the advantages of this unit?

1. Animals from different sources with different micro-biological profiles can be maintained in the same room without cross contamination.
2. Investigators can experimentally infect animals with a variety of microbial agents in the same room without interfering with one another's research.
3. Many different species of animals can be maintained on study within the same room.
4. Personnel do not have to shower into or out of the room.
5. There is no need for a clean/dirty corridor system.
6. Personnel with allergies to animal dander can work in comfort.
7. Animals can be moved to a different room when HVAC units fail without jeopardizing the integrity of the system, and thereby allowing expensive research studies to continue.
8. Animals housed in MICRO-ISOLATOR Units are not only protected from contamination from other lab animals, but are also protected against contamination by people.
9. Animals can be maintained in the total absence of ammonia if the MICRO-ISOLATOR Units are stocked with isolator animals devoid of urease-positive bacteria.



But is the air interchange really adequate?

Institutions now using this system report that hypoxia is not a problem and three laboratories have tested the levels of oxygen inside and outside of the unit and report no difference. Levels of carbon dioxide are only slightly increased. Additionally, ammonia level is not a problem if the population density per cage is kept low, or if the bedding is changed every three or four days... especially when relative humidity cannot be well controlled.

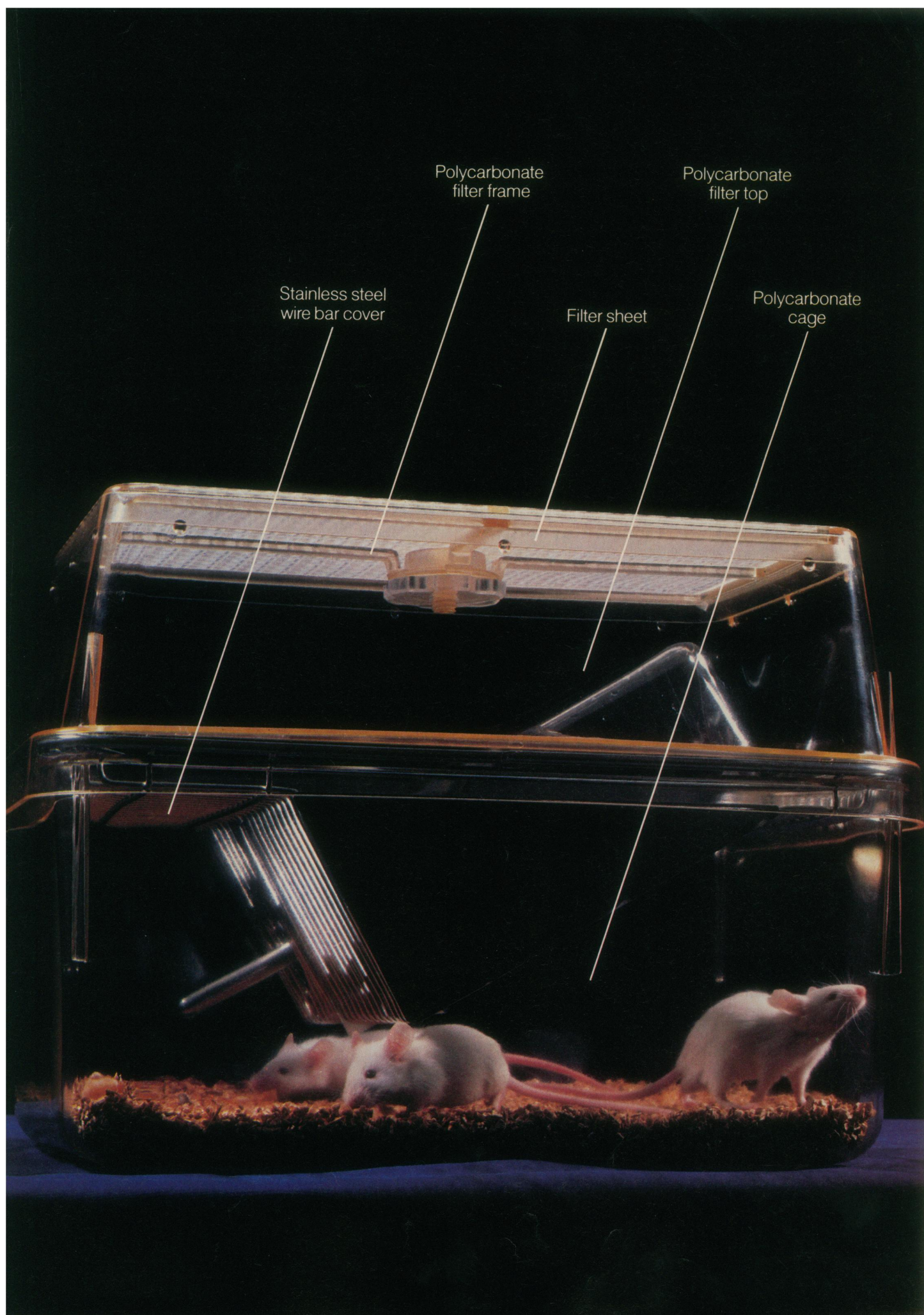
What else do I need to make the MICRO-ISOLATOR Housing Unit work?

To effectively maintain the isolation of the animals at all times, cages must be opened and serviced within a Class 100 workbench and aseptically supplied with sterile or pasteurized feed, bedding, and water.

Components of the MICRO-ISOLATOR Housing Units*

- #10209 —Small MICRO-ISOLATOR complete
- #10272 —Polycarbonate cage 11 1/2" x 7 1/2" x 5"
- #10227 —Stainless steel wire bar cover
- #10204 —Polycarbonate filter top complete
- #10205 —Polycarbonate filter frame only
- #10206 —Replacement filter sheets
- #30405 —3" x 5" vertical cardholder
- #30405H —5" x 3" horizontal cardholder
- #10309 —Large MICRO-ISOLATOR complete (for mice)
- #10373 —Polycarbonate cage 19" x 10 1/2" x 5"
- #10428M —Stainless steel wire bar cover
- #18704 —Polycarbonate filter top complete
- #18705 —Polycarbonate filter frame only
- #18706 —Replacement filter sheets
- #30505 —3" x 5" vertical cardholder
- #30505H —5" x 3" horizontal cardholder
- #10410 —Large MICRO-ISOLATOR complete (for mice)
- #10474 —Polycarbonate cage 19" x 10 1/2" x 6"
- #10428M —Stainless steel wire bar cover
- #18704 —Polycarbonate filter top complete
- #18705 —Polycarbonate filter frame only
- #18706 —Replacement filter sheets
- #30505 —3" x 5" vertical cardholder
- #30505H —5" x 3" horizontal cardholder
- #10409 —Large MICRO-ISOLATOR complete (for rats)
- #18727 —Polycarbonate cage 19" x 10 1/2" x 8"
- #10428 —Stainless steel wire bar cover
- #18704 —Polycarbonate filter top complete
- #18705 —Polycarbonate filter frame only
- #18706 —Replacement filter sheets
- #30505 —3" x 5" vertical cardholder
- #30505H —5" x 3" horizontal cardholder

*For information on hamster and guinea pig cages please contact Lab Products, Inc.



STAY-CLEAN Laminar Flow Workbench

For the MICRO-ISOLATOR System to work, the cages must be opened and serviced within a laminar flow workbench and aseptically supplied with sterile or pasteurized feed, bedding, and water.

What is the STAY-CLEAN Laminar Flow Workbench?

The workbench is a moveable laminar flow unit that provides a sterile work surface and recaptures almost all airborne contaminants from the cage and prevents their escape into the laboratory or onto the operator when animals are transferred to clean cages.

Who needs it?

Anyone using the MICRO-ISOLATOR System who requires a readily available unit for changing MICRO-ISOLATOR Cages.

What are the benefits of this workbench?

When combined with the MICRO-ISOLATOR Housing Unit and the new service cart, the workbench creates the only self-contained animal care system available. As a total system, hundreds of animals a day can be transferred to clean cages without contamination, and because of its mobility—it passes easily through a standard 36" lab doorway—one laminar flow workbench can meet the daily needs of several small labs.

How does the workbench function ?

HEPA-filtered air* flows from the back of the workbench horizontally across the cages, pulling escaping particles from the cage into the perforated front edge of the workbench. The unidirectional flow of the air prevents particles from flowing into the operator's face or cross-contaminating cages sitting side by side on the work surface. Additional advantage: operators allergic to animals can work at the unit trouble free.

How is the air filtered?

A high capacity blower draws air into the front edge of the workbench through a pre-filter and finally through a HEPA filter.

How effective is the HEPA filter?

It removes 99.99% of particles 0.3 microns in size or larger. Particles smaller than 0.1 microns are retained even more efficiently.

How long do the filters last?

Average life is about two years, but can reduce to one year with heavy usage or increase to three years with lighter usage with proper pre-filter maintenance. A gauge mounted on the front of the unit shows how well

the HEPA filter and pre-filter are functioning. A red light and graphic panel will notify the operator that the filters need to be changed.

What else is monitored?

A special gauge also monitors air flow through the unit and registers any decrease. If the flow drops off completely because of a failed motor, a warning light goes on.

What about vibration and noise?

The workbench is designed to operate quietly and free of vibration. The motor and blower are specially mounted to minimize noise and vibration, and the high volume air flow (100 feet per minute) is comparable to other laminar flow units in its class.

Is it easy to clean and service?

The front edge folds down, giving access to the pre-filters and a stainless steel tray that catches debris. These elements can be easily removed for cleaning and service. Also, the work surface is made of easy-to-clean electropolished stainless steel.

What are the other materials of construction?

The unit is constructed from cold-rolled steel. The work surface is stainless steel and the rear and top panels aluminum. Plexiglas panels enclose the sides of the work area and allow ambient light into the work area. These materials combine to form a strong yet lightweight workbench that is easily moved.

What about additional lighting?

A fluorescent light is mounted directly above the work surface for full visualization of the animals and cages.

*High efficiency particulate air



Operation

The magnahelic gauge senses pressure increases or decreases by inches of water. This measurement is then related to the corresponding pressures of a clean filter which is specified by the filter manufacturer. A clean filter has a resistance of 0.4" of water at 1000 CFM. A dirty filter at the same velocity of air (1000 CFM) is 0.8" of water, doubling the clean filter water reading. The gauge read-out indicates the clean filter area in a green band. As the HEPA filter begins to fail, pressure will increase upstream of the filter causing the gauge pointer to enter the red area designated "HEPA" with the word "CHANGE" directly beneath the red band.

At this point, a red light located directly beneath the gauge will illuminate. This will give the researcher a visual warning that the HEPA filters need servicing.

At the other end of the scale, on the same gauge, the red band will indicate that the pre-filters are beginning to fail. This will have the reverse effect upon the filter sensors. As the amount of air is restricted by dirt build-up, air pressure decreases within the plenum chamber, causing a drop in pressure.

The filter warning label on the unit and the accessibility of the pre-filters are sufficient so that no warning light will illuminate. Changing of the pre-filters (two to four weeks) will be regulated by the room conditions.

To identify the operational condition of the blower unit, an additional gauge is provided to detect air flow speed within the blower housing itself. The magnahelic gauge senses air flow changes via a sensitive pilot tube located in direct air flow before entering the plenum chamber. With the blower unit running at high speed, the dial on the analog read-out will indicate pressure to be "GOOD" designated by a green band. As pressure decreases, the dial indicator will drop into the "FAIR" yellow band. If the gauge measures FPM 0-2400, problems could arise within the motor, e.g., short, burned out bearing. The dial will begin to move in the red area. A pressure switch will detect the loss in pressure and illuminate the warning light directly below the magnahelic gauge.

Control panel

To regulate the amount of air flow designated by motor speed, the STAY-CLEAN System uses a four-position, heavy-duty, oil-tight switch. This gives the technician three distinct speeds and the security of the proper air flow at all times.

Below this four-speed switch is an indicator light or pilot light (green) displaying that the unit has been activated and the motor is running. If the green light does not illuminate, check the power source fuse.

Within the front panel boundaries is located a special low profile fuse holder which restricts the chance of damage due to handling and the moving of the unit.

Power source and blower

The STAY-CLEAN System utilizes 1/3 horsepower, three-speed direct-drive General Electric blower motor with permanent-type bearings. This motor is mounted into a blower assembly which is engineered with precise equipment and measuring instrumentation under test conditions of AMCA Code, Bulletin 210.

Since direct-drive blower performance is affected by motor placement in the inlet of the blower, all testing with the motor in position and performance induces its effect. With 1/3 horsepower motor the blower unit utilizes approximately 1050 RPM at 321-torque, ounces/inches. Performance curve available upon request.

The entire blower housing with motor is mounted on multi-plane mounts to reduce vibration and noise. This means the motor is totally isolated from the rest of the unit, insuring quiet and vibration-free service.



Specifications

1. Constructed of 16 gauge cold-rolled steel painted with a baked textured yellow enamel finish.
2. Work surface and perforated edge, 18 gauge stainless steel electropolished to reduce contaminant build-up in surface pores.
3. Fluorescent light fixture mounted in top canopy utilizing two 40 watt lamps producing 100 foot candles at work surface.
4. Convenient changing of pre-filters (disposable) and electropolished waste tray from the front of the work area.
5. Direct-drive three-speed, $\frac{1}{3}$ horsepower motor, 115 volts motor/blower assembly completely isolated from work area and main frame via shock dampening mounts for vibration-free service.
6. Horizontal laminar flow downstream side of HEPA filters averages 100 LFPM at low speed (new filters).
7. Dual protection of HEPA filter media by an interior expanded aluminum grill and an external perforated black anodized screen (removable for cleaning).
8. The external screen also protects HEPA filters from harmful liquids splashing onto the media itself causing filter breakdown.
9. Low-profile HEPA filter cassette pack rated at 99.99% effective to 0.3 micron size particle matter.
10. Knife edge type design to insure complete sealing of HEPA filter if unit is moved from room to room.
11. Portability and compactness for ease of installation, mobility throughout facility.
12. Mounted on four phenolic casters inboard for access through doorways.
13. Overhead canopy houses all motor controls, lighting and gauge accessories.
14. Coded magnahelic gauges with press-to-test warning lights to indicate to operator malfunctions in motor/blower assembly, pre-filter and HEPA filter loading conditions.
15. HEPA filter measures 48" wide x 30" high x 3" deep with a rated capacity of 1175 CFM at 1.0" WG.
16. Initial resistance .75@ 975 CFM.
17. DOP penetration .003% @ 975 CFM.
18. Overall unit dimensions—52" wide
34" deep (max)
75" high
19. Work surface dimensions—25.312" deep with perforation
50.250" wide
20. Work surface area—1271.93 square inches

Ordering information

#30909—STAY-CLEAN Laminar Flow Workbench

The Service Cart

The service cart completes the MICRO-ISOLATOR System by simplifying the movement of all necessary supplies to the laminar flow workbench for servicing the MICRO-ISOLATOR Units. Note that MICRO-ISOLATOR Units should not be placed on the floor.

Specifications

Portable unit on casters. All stainless steel frame, glass bead finish, work surface 2B finish with $\frac{7}{16}$ " lip to prevent spilling.

Unit also features two plastic drawers for storage. Drawer size approximately 12 $\frac{1}{2}$ " wide x 22" long x 8" deep.

Unit dimensions

Length with handle—35.000"

Width—22.500"

Height—36.000"

Work surface—30.000" Length

—25.500" Width

Work surface area—675 square inches

Ordering information

#44990—Service Cart for STAY-CLEAN Laminar Flow Workbench



Procedures for using the MICRO-ISOLATOR System

Important

As with any system, compliance with the proper operating technique is vital. Shortcuts or technique alterations must be avoided. (Lab Products, Inc. personnel are available to discuss specialized needs.)

The basic principles of the MICRO-ISOLATOR System

The MICRO-ISOLATOR System places the contamination barrier at cage level. This is accomplished by the use of a MICRO-ISOLATOR Housing Unit whose external components consist of a filter top and a cage bottom. Because the special MICRO-ISOLATOR Filter Top overlaps the bottom cage, the system forms—and functions as—a giant Petri dish-like structure. Result: there is an interchange of external and internal gases while still maintaining the classical Petri dish-like barrier to microbial contamination.

There are only two ways to maintain the integrity of a MICRO-ISOLATOR Unit:

1. keep it closed and off the floor in an insect-controlled room
2. open it *only* in an appropriate laminar flow workbench.

Accordingly, *all* manipulation involving animals, MICRO-ISOLATOR Elements or their contents must take place within the workbench.

Another vital concept: *everything* (except the MICRO-ISOLATOR Units) that goes into the workbench must be carefully disinfected first.

The correct procedure for using the complete MICRO-ISOLATOR System

1. Assemble a MICRO-ISOLATOR Housing Unit: cage, bedding, bar lid, autoclavable feed, water bottle, rubber stopper, sipper tube, and top filter frame. (That is, everything *but* the animal and the water.)

2. Autoclave the assembled MICRO-ISOLATOR Housing Unit in a vacuum autoclave. (Sterilization or pasteurization cycle). **IMPORTANT:** monitor the autoclave's performance with both instrumentation and biological indicators. Be sure that the autoclave cycle ends with a 15-20 minute drying period (under vacuum) to insure that the filter medium is dry before the autoclave door is opened. This will also dry the bedding. Do not place MICRO-ISOLATOR Units on the floor.

3. Autoclave Amsco Square-Pak™ flasks filled with water.

4. Operator dons a disposable lab coat and gloves and then tapes gloves to coat to form a tight seal. (NOTE: first check gloves for pinholes.)

5. Transfer autoclaved assembled MICRO-ISOLATOR Housing Units, Square-Pak flasks, and animals to the vicinity of the workbench using the service cart.

6. Spray arms and gloves with sterilant. (NOTE: gloves must be *wet* with sterilant at *all* times while working in workbench.)

7. Wipe down internal surfaces of workbench hood (wall and floors but *not* back filter wall) with sterilant.

8. Place MICRO-ISOLATOR Housing Unit in workbench and remove the filter frame top as if removing a Petri dish lid; that is, to place the filter frame to the *left* of the cage bottom, tilt the filter frame off the cage bottom to the left and all the way upside down, then lay it upside down on the surface of the workbench. (Reverse direction to place filter frame to right of cage bottom.) This procedure prevents dust particles from blowing from the top of the filter frame into the cage bottom.

9. Spray Square-Pak and place in workbench. Fill water bottle, add stopper and sipper tube, and place in cage.

10. *Filter-crated animals* (from an SPF colony compatible with your research needs): have the crate *carefully* inspected for integrity. If satisfactory, thoroughly spray the crate with sterilant *including the filter* and place in workbench and open. (If tool is used for this, it must be kept in the sterilant tray in the hood along with the animal transfer forceps.) (Go to step 12.)

11. *Animals currently in a MICRO-ISOLATOR Housing Unit:* place the MICRO-ISOLATOR Unit in the workbench and open as in step 7.

12. Take the totally submerged forceps from sterilant tray in workbench, shake off excess sterilant away from the back of the hood to avoid wetting the filter and carefully transfer the animals to the cage. Put filter frame on cage bottom. Unit now ready.

Note:

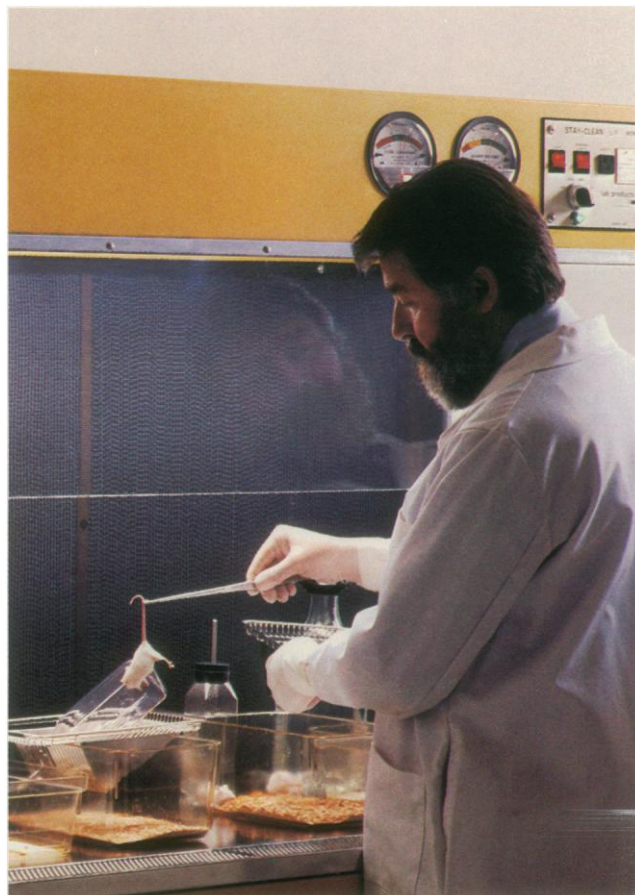
- MICRO-ISOLATOR Housing Unit is only opened in the workbench.
- MICRO-ISOLATOR Unit is kept off the floor.
- Everything (except the MICRO-ISOLATOR Units) must be sterilant-sprayed beforehand.
- Gloved hands must always be wet with sterilant.
- Follow procedure carefully and consistently omitting no steps.

Soiled MICRO-ISOLATOR Units should be pasteurized in an autoclave before washing. Then restock and autoclave before use.



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Other products from Lab Products, Inc.— the leader in environmental control products

Lab Products now offers the widest selection of systems for environmental protection: the new MICRO-ISOLATOR System; the VR-1 Ventilated Animal Rack; five STAY-CLEAN Laminar Flow Systems; ISOSYSTEM™ Housing System consisting of a disposable filter cap, cage cover, and plastic cage; ENVIRO-GARD™ Filter System with permanent filter bonnets; and SEETHROUGH™ Suspended Cage Systems with a special filtering system. We are now likely to have at hand solutions to virtually all of your environmental problems.

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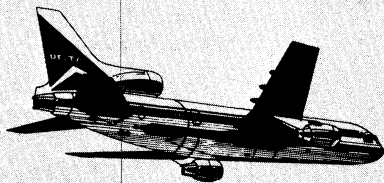
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1-800-282-8536), seven days a
week, 8:30 a.m. to 8:00 p.m.
Eastern time.

Delta Air Lines offers you:

- 35% off regular roundtrip coach fare.
- No minimum stay requirement
- No black-out days (days on which discounts do not apply).

Conditions:

- Departure for Los Angeles between 24 and 28 May 1985.
- Return within 15 days of departure date.
- Reservations and ticketing must be completed 7 days before departure.



UNITED AIRLINES

**Fly to the AAAS
Los Angeles Meeting and
Travel on to Honolulu**

AAAS Convention Code: 513-E

Call Toll Free: 800-521-4041, Mon-
day through Friday, 8:30 a.m. to
8:00 p.m. Eastern time.

**United Airlines offers you a
choice of:**

- 5% off Hawaiian Excursion fare to Honolulu with stopover fee for Los Angeles convention.*
- 20% off Easy Saver fare (a Saturday night stay required).*
- 40% off regular roundtrip coach fare (no minimum stay required).*

*These special tariffs are not valid for travel on two specific days: 24 May and 27 May.

Conditions:

- Travel dates (including Hawaii trip) must be between 20 May and 9 June 1985.
- Reservations and ticketing must be completed by the day before departure.

Call the airline's toll free number and give the AAAS convention code. Specialists will provide information and make reservations. Tickets will be mailed to your home or office.

If you use a travel agent, ask the agent to use the toll free number and AAAS convention code to obtain the above discount fares.

Note: The special convention fares do not apply to other discounted rates. There may be other promotional air fares; however, they are limited and have restrictions. Check with the United or Delta convention desk for the greatest discount applicable to your itinerary.



Annual Meeting
Los Angeles
26-31 May 1985

**ADVANCE
REGISTRATION
(A)**

MAIL TO:
AAAS—DEPT. R
1515 Massachusetts Ave., N.W.
Washington, D. C. 20005

Name of Registrant:

(Last)

(First and Initial)

Name of Spouse Registrant:

(Last)

(First and Initial)

Institution/Company Name:

(To be printed on badge)

(Registrant)

(Spouse Registrant)

Mailing Address:

(For receipt of program(s), badge(s); and
Science [for new applicants])

(Street)

(City)

(State)

(Zip Code)

Convention Address:

(Where you can be reached)

(Hotel and/or Phone No.)

Check days
attending:

Sun Mon Tue Wed Thu Fri
☐ ☐ ☐ ☐ ☐ ☐

☐ Please check here if you need special services due to a handicap. We will contact you prior to the meeting.

- Please check appropriate boxes, complete remainder of form (type or print), and **enclose payment or charge to credit card below.**
- Use separate form (photocopy) if you wish to submit additional registrations other than spouse's.
- Preconvention program, badge, and voucher for full program and abstracts will be mailed to registrants in mid April.
- **Registrations received after 10 May** will be held at the *Advance Registrants' Desk* at the Bonaventure Hotel.
- **Refund requests** for registration fees must be made by letter or telegram before 17 May 1985 and will be honored **after** the Annual Meeting.
No refunds are made on cancellation requests received after this date.
- Special one-day attendance registration will be available at on-site registration desks only.

Registration Category	Regular		Student or Retired	
	Single	Double	Single	Double
<input type="checkbox"/> AAAS Member	<input type="checkbox"/> \$ 60	<input type="checkbox"/> \$ 80	<input type="checkbox"/> \$ 30	<input type="checkbox"/> \$ 50
<input type="checkbox"/> Non-Member:				
<input type="checkbox"/> Meeting registration only	<input type="checkbox"/> \$ 75	<input type="checkbox"/> \$ 95	<input type="checkbox"/> \$ 30	<input type="checkbox"/> \$ 50
<input type="checkbox"/> Register and join: Single membership	<input type="checkbox"/> \$120	<input type="checkbox"/> \$140	<input type="checkbox"/> \$ 70	<input type="checkbox"/> \$ 90
<input type="checkbox"/> Register and join: Double membership		<input type="checkbox"/> \$157		<input type="checkbox"/> \$107

Students: Fulltime undergraduate or graduate students only.

Double Membership (registrant and spouse) includes single subscription to *Science* (51 issues per year).

1985 Membership Dues: Regular Member, \$60; Student or Emeritus, \$40; Spouse or Emeritus without *Science*, \$17.
Inquire for Canadian and other foreign rates.

Specify name(s) of new member(s):

Charge to my ☐ VISA or ☐ MASTERCARD

Account No. _____ Expiration Date _____

Cardholder's Name _____ Signature _____
(Please print)

SURVEY OF ATTENDANTS

Annual Meeting, Los Angeles, 26-31 May 1985

Your answers to the following questions will help us to plan future Annual Meetings. Please complete the form and either return it with your registration form or send it separately (to the same address) if you wish to respond anonymously (the two forms will be processed separately).

Principal Professional Interest

- 11 ☐ Physical, mathematical
12 ☐ Biological, medical
13 ☐ Engineering
14 ☐ Social, behavioral
15 ☐ Science policy
16 ☐ _____
(other)

Principal Professional Activity

- 21 ☐ Teaching, education
22 ☐ Health practice
23 ☐ Other practice, consulting
24 ☐ Research, development
25 ☐ Administration
26 ☐ _____
(other)

Institutional Affiliation Type

- 31 ☐ University, 4-year college
32 ☐ Other educational
33 ☐ Industrial, commercial
34 ☐ Other Private
35 ☐ Government
36 ☐ _____
(other)

Highest Educational Level

- 41 ☐ Doctoral Degree
42 ☐ Master's Degree
43 ☐ Other professional
44 ☐ Bachelor's Degree
45 ☐ _____
(other)

Age

- 51 ☐ Under 26 years
52 ☐ 26 to 35 years
53 ☐ 36 to 45 years
54 ☐ 46 to 55 years
55 ☐ 56 to 65 years
56 ☐ Over 65 years

**Number of Past AAAS
Meetings Attended**

- 61 ☐ None
62 ☐ One
63 ☐ Two
64 ☐ Three
65 ☐ Four
66 ☐ Five or more

Distance Traveled to Meeting

- 71 ☐ Under 51 miles
72 ☐ 51 to 150 miles
73 ☐ 151 to 400 miles
74 ☐ 401 to 1000 miles
75 ☐ 1001 to 3000 miles
76 ☐ Over 3000 miles

MAIL TO:
AAAS HOUSING BUREAU
P.O. BOX 71608
LOS ANGELES, CA 90071

HOTEL
RESERVATIONS

Annual Meeting
Los Angeles
26-31 May 1985



Send confirmation to:

Name _____ Street _____

City _____ State _____ Zip _____ Phone No. _____

Other occupants of room:

Name _____ Name _____

Choice of hotel: 1. _____ 2. _____

Room: ☐ Single ☐ Double ☐ Twin Suite: ☐ 1 Bedroom ☐ 2 Bedrooms Preferred Rate: \$ _____

Please indicate special housing needs due to a handicap: ☐ Wheelchair accessible room.

Other _____

Arrival Date: _____ Time: _____ ☐ a.m. ☐ p.m.

Departure Date: _____ Time: _____ ☐ a.m. ☐ p.m.

Be sure to list definite arrival and departure date and time. Reservations will be held only until 6 p.m. unless accompanied by 1 night's deposit or guaranteed by a major credit card.

Credit Card _____ Number _____ Exp. Date _____

Cardholder's Name (print) _____ Signature _____

-
- All hotel reservations must be submitted to the AAAS Housing Bureau in writing (use form above; type or print).
 - Reservations must be received by the Housing Bureau **not later than 3 May 1985**; reservations received after that date are conditional upon space availability at the hotels.
 - Rooms are assigned on a first come, first served basis. If room rate requested is no longer available, the next available higher rate will be assigned.
 - Confirmation will come directly from the hotel. All changes and cancellations must be made through the AAAS Housing Bureau until 3 May; thereafter contact the hotel directly. After 13 May you may call the Housing Bureau (213/488-0211) for referral to available hotels.

HOTEL RATES*

Hotel	Single	Double & Twin	Parlor + 1 Bedrm.	Parlor + 2 Bedrms.
The Westin Bonaventure 404 S. Figueroa Street Los Angeles, CA 90071	\$65, 70	\$75, 80	\$230 & up	\$330 & up
Los Angeles Hilton 930 Wilshire Blvd. Los Angeles, CA 90017	\$62, 67	\$72, 77	\$185 & up	\$235 & up

*Add 10% occupancy tax per night.

- Roll-away beds or extra person in room: Bonaventure, \$20/night; L.A. Hilton, \$16/night.
- Children are accommodated free of charge in same room with parents: L.A. Hilton, no age limit; Bonaventure, age 18 and under.