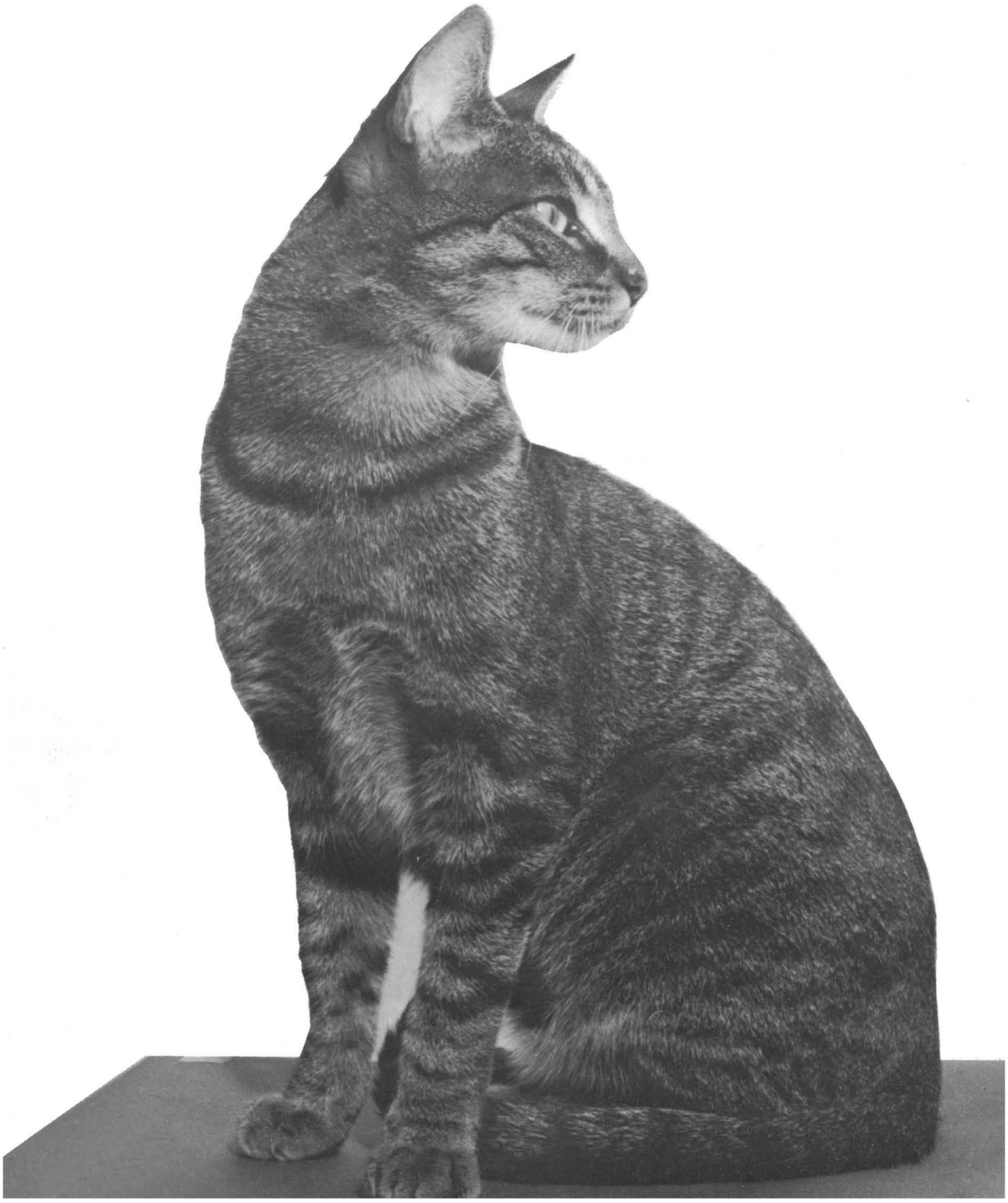
SCIENCE

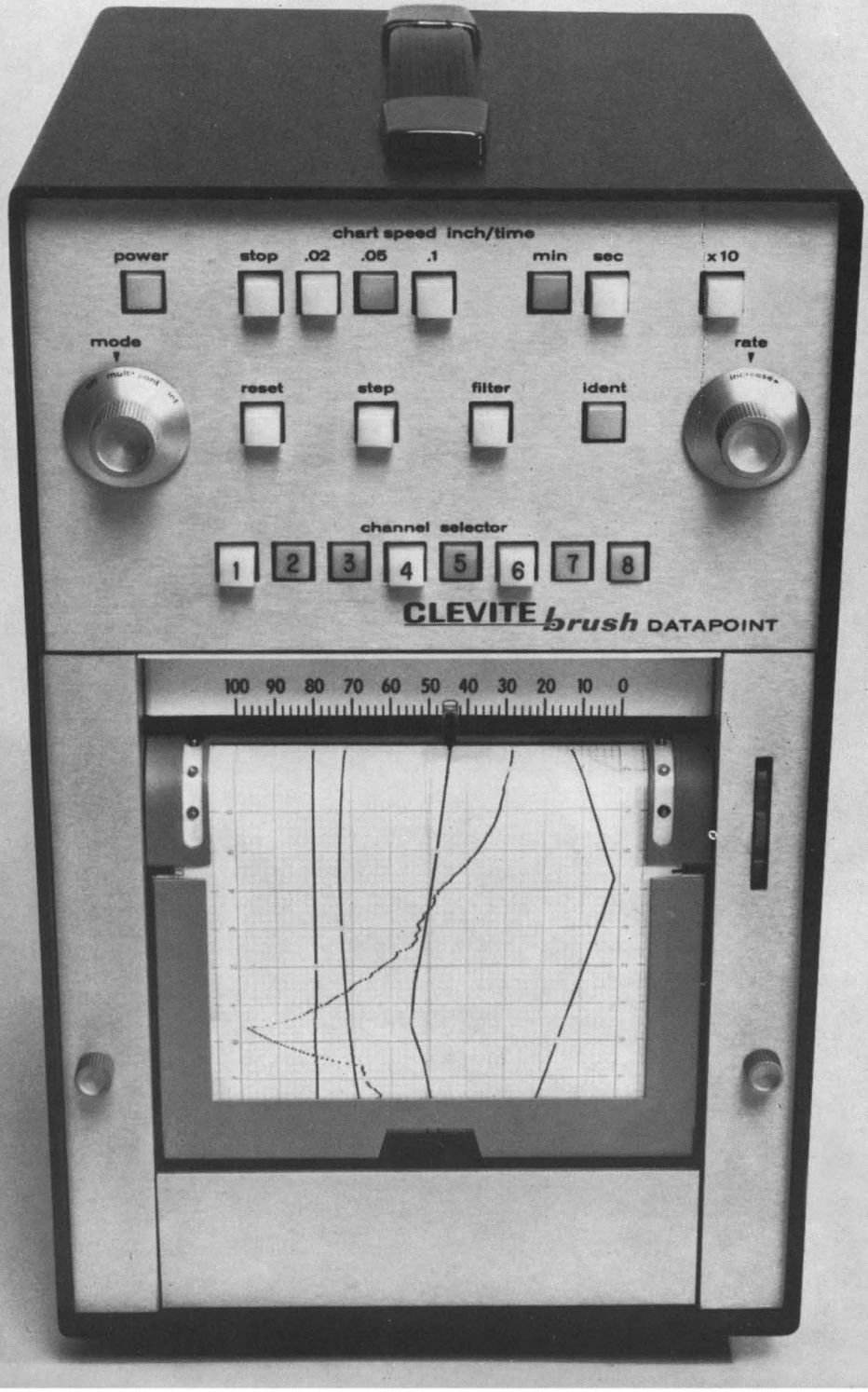
13 June 1969
Vol. 164, No. 3885

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Meet Datapoint. It's 20 times faster than other multipoint recorders.

And infinitely more versatile.



This new high-speed multipoint recorder by Brush runs off as many as 20 samples per second on 2 to 8 channels. So it's great for monitoring fast-changing variables in temperature, flow, pressure, strain, chemical processes, displacement dynamics and the like.

Datapoint handles mixed inputs from high and low level inputs. All on one chart. Recordings come out clear, crisp, uncluttered. And Z-folded. You've got a choice of 12 chart speeds, pushbutton controlled.

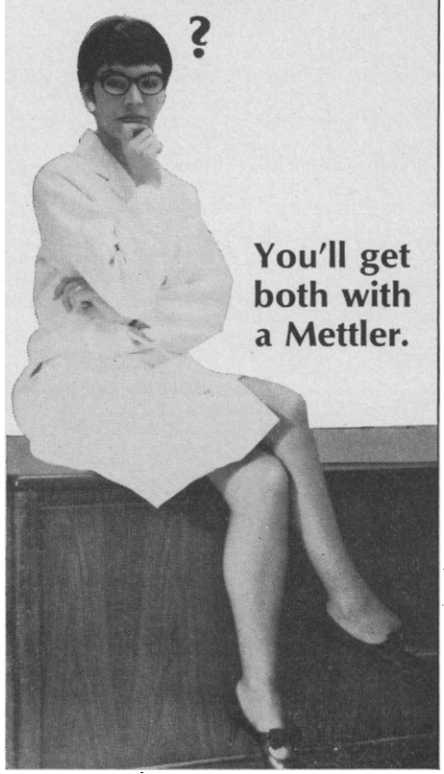
About that versatility. Datapoint works in three modes: multipoint sampling, intensified sampling, for channels of high dynamic content, or continuous single channel recording. So you get much more than just a fast multipoint recorder. Without paying more to get it.

And Datapoint is accurate, too. A full 99.5%, enforced by a non-contact position-feedback system. It's a first in this type of recorder. (But a proven success in countless Brush direct writing oscillographs.)

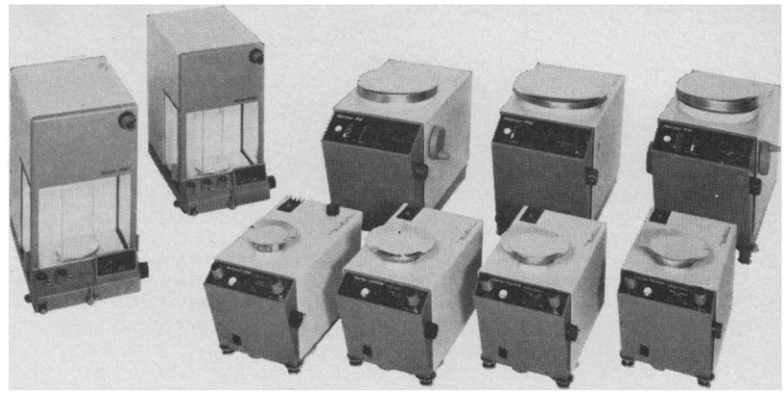
Speed. Versatility. Accuracy. These make Datapoint a new concept in recording. There's never been anything like it. You'll find more proof in the Datapoint brochure. Send for your copy today. Clevite Corporation, Brush Instruments Division, 37th and Perkins, Cleveland, Ohio 44114.

CLEVITE BRUSH

Why choose between economy and performance when you buy a balance ?



You'll get both with a Mettler.



Want weighing performance, but worried about exceeding your budget? Here are 38 solutions to the balance buyer's dilemma. Mettler's 16 top-loading and 22 analytical balances.

SPEED + PRECISION = PERFORMANCE

Our top-loaders are tops when it comes to speed and weighing ease. Put the sample on the pan. Then read the weight. If you are filling a container to a target weight, Mettler's helpful filling guide shows the approximate weight on the pan throughout the filling . . . without interruptions.

Newest of the Mettler top-loaders is Model P162. It weighs up to 160 g with a precision of ±1 mg and features 10-g taring ability. Like other Mettler top-loaders, it provides digital and analog readout. Your new personnel will get the same precise results as the old hands in the department.

MANY TO CHOOSE FROM

Select the balance you need for your work from one of our top-loaders. We have one that weighs to 10 kg; another that takes arithmetic out of weight loss studies. Some automatically compensate for changes in level. All will carry out five types of weighings. Weighing unknowns. Checkweighing. Weighing-in. Batching. Weighing objects below the balance.

THE ECONOMICAL ANALYTICALS

One of the major features of all Mettler analytical balances is the impressive precision-capacity ratio. Take our low-cost Model H10. It weighs to 0.1 mg over the 0 to 160-g range. That's one part in 1,600,000.

You get two balances for the price of one with our Mettler Model H20. It combines the capacity of a macro analytical with the precision of a semi-micro. Some Mettler analyticals give an instant reading of the approximate weight on the pan. We call this feature preweighing.

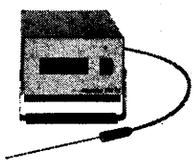
WEIGHT WATCHING MADE EASY

With digital readout — standard on many Mettler analyticals — you'll weigh with unsurpassed speed, convenience and accuracy. A filling guide cuts your weighing-in time by 50 percent. Optical taring allows you to compensate for container weights.

Need clearly printed records of your weighings? Check our Models H10P and H20P which print out results on adhesive-backed paper. Then there's our sophisticated H20E electronic. As it weighs, it generates an analog signal which can be fed to compatible instrumentation such as recorders. The H20E can also be interfaced with computer or other control equipment to continuously monitor and keep weight changes within predetermined limits.

There are more: from our $550 basic balance that's ideal for classroom use to our $2,550 ultra-micro with ±0.1 microgram precision.

When is a Mettler NOT a balance?



When it's our TM 15 digital platinum resistance thermometer. Portable and precise, it provides absolute accuracies up to ±0.15°C over the −20 to +300°C range. The sensors may be changed without recalibration and provide a linear output to other instruments.

For information or a demonstration of a Mettler balance or the new TM 15, write Mettler Instrument Corporation, 20 Nassau St., Princeton, N.J. 08540.

Mettler®

13 June 1969
Vol. 164, No. 3885

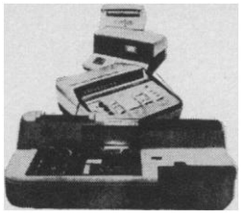
SCIENCE

SCIENCE is published weekly on Friday and on the fourth Tuesday in September by the American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Now combined with **The Scientific Monthly®**. Second-class postage paid at Washington, D.C. Annual subscriptions $12; foreign postage: Americas $3; overseas $5; single copies, 50¢ (back issues, $1) except **Guide to Scientific Instruments**, which is $2. *School year subscriptions:* 9 *months*, $9; 10 months, $10. Provide 4 weeks notice for change of address, giving new and old address and zip codes. Send a recent address label. SCIENCE is indexed in the **Reader's Guide to Periodical Literature.**

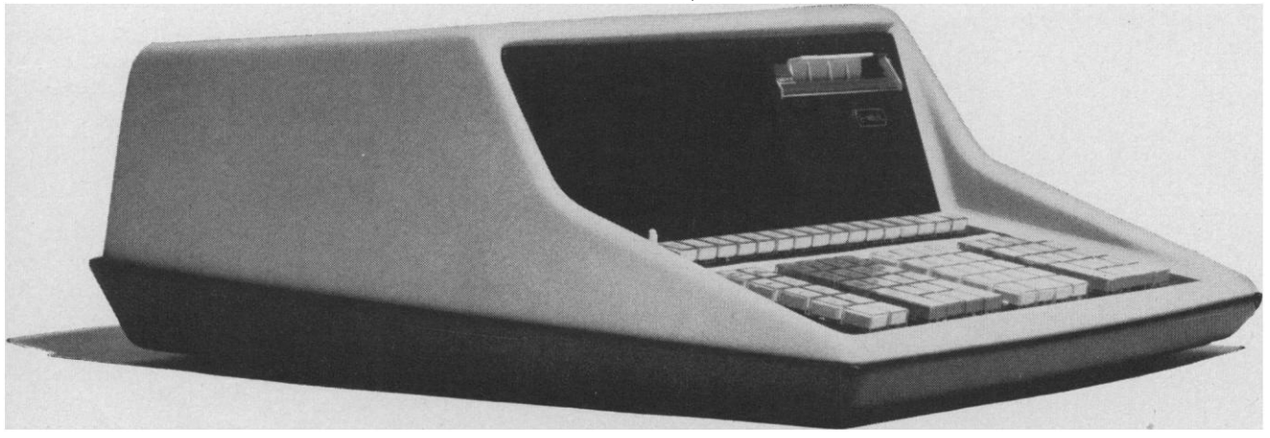
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

House cat (*Felis domestica*) before being fed "catnip" (*Nepeta cataria*). *cis, trans*-Nepetalactone is the major constituent of the volatile "oil of catnip" and is metabolized to dihydronepetalactone and α-nepetalinic acid. Cats usually respond by sniffing *N. cataria* leaves, rubbing against a plant, and finally ingesting the leaves. Some cats become somewhat intoxicated after smelling the oil or eating the leaves. See page 1281. [Paul McCrary, Oklahoma State University Photo and Graphic Arts Center]



Generation Gap



The Wang 700 calculator is a whole lot smarter than its predecessors.

It's the first of a new breed, a third generation programmable calculator. The difference is more revolutionary than evolutionary. It's ten times faster and more powerful than the best of the 2nd generation machines. It handles far longer programs (learns on a built-in 8192-bit core and stores permanently up to 10 blocks of 960 steps each on snap-in magnetic tape cassettes), has many more data storage registers (up to 120), and provides more hardware operations (like logs to base e and base 10, π, e^x, 10^x, etc.), than any existing calculator or so-called desk-top computer. Execution speeds for various functions range from 300 μsec for + and — to 250 msec for trig functions. A dual Nixie-type display produces 12 digit answers plus 2-digit (—98 to +99) exponents each register. The Wang 700 has commands for loops, branches and subroutines, unmatched power for matrix and array operations. Exclusive integrated circuit design concentrates all these capabilities into a self-contained, convenient desk-top package. It's the logical heir to Wang leadership in high performance problem-solving.

SALES/SERVICE OFFICES

Alabama
(205) 881-5360
Arizona
(602) 274-2110
California
(213) 776-2985
(714) 234-5651
(415) 692-0584
(805) 962-6112
Colorado
(303) 364-7361
Connecticut
(203) 288-8481
Delaware
(215) 642-4321
District of Columbia
(301) 588-3711
Florida
(305) 841-3691
(305) 563-8458
(813) 877-6590
Georgia
(404) 633-6327
Hawaii
(808) 536-5359
Illinois
(309) 674-8931
(312) 297-4323
Indiana
(317) 631-0909
Iowa
(515) 288-5991
Idaho
(303) 364-7361
Kansas
(816) 444-8388
Kentucky
(502) 426-1116
Louisiana
(504) 729-6858
Maryland
(301) 588-3711
(301) 821-8212
Massachusetts
(617) 851-7311
(617) 542-7160
Michigan
(313) 352-2144
(616) 454-4212
(517) 835-7300
Minnesota
(612) 881-5324
Mississippi
(601) 982-1721
Missouri
(816) 444-8388
(314) 727-0256
Nebraska
(515) 288-5991
Nevada
(702) 322-4692
New Jersey
(201) 272-7160
New Mexico
(505) 255-5775
New York
(212) 682-5921
(516) 437-2500
(518) 463-8877
(716) 381-5440
(315) 463-9770
North Carolina
(919) 272-5683
Ohio
(614) 488-9753
(216) 333-6611
(513) 531-2729
Oregon
(206) 525-2000
Oklahoma
(918) 747-0018
Pennsylvania
(215) 642-4321
(717) 236-4782
(412) 366-1906
Tennessee
(615) 524-8648
Texas
(512) 454-4324
(214) 361-7156
(713) 668-0275
(817) 834-1433
Utah
(801) 487-2551
Virginia
(703) 595-6777
(703) 359-6320
Washington
(206) 525-2000
West Virginia
(304) 344-9431
Wisconsin
(608) 244-9261
(414) 442-0160
Wyoming
(303) 364-7361
Calgary
(403) 266-1804
Montreal
(514) 482-0737
Ottawa
(613) 728-4445
Toronto
(416) 364-0327
Vancouver
(604) 685-2835

WANG
LABORATORIES, INC.

Dept. 6Q, 836 North St., Tewksbury, Massachusetts 01876 • Tel. 617 851-7311

not presented in sufficient detail to be sure. The proportion of the increased salaries to be given to officers is only 5 to 10 percent of the total increase, so is not as critical.

3. See W. L. Hansen and B. A. Weisbrod [*Quart. J. Econ.* **81**, 395 (1967)] for a discussion of the implicit economic transfer from draftees to the public at large.

Arbiters of the Pesticides

Robert van den Bosche's opinion of toxicologists and chemical company sales personnel is noted (Letters, 2 May). But surely the highly trained and well-informed research and extension personnel of the many experiment stations and universities are the ones who decide what pesticides are applied, and where, in the United States. Wouldn't it be fair to state then that these people, together with the huge block of competent scientists in the USDA, "dominate" the pest control field?

. . . The members of the pesticide industry are painfully aware of the ecological disasters which can go hand-in-hand with their profession [see the fine paper on this whole subject by Hennberry, *Bull. Entomol. Soc. Amer.* **14**, No. 3 (1968)]. To label most toxicologists and pest control salesmen as being either ignorant of or indifferent to ecological problems is foolish! These men have been trained in the biological sciences and in most, perhaps all, cases have had at least a basic course in both ecology and applied entomology. In fact to become a salesman (the term Field Technical Representative is preferred) with most reputable companies today, one must have a Ph.D. in entomology or some related field. . . .

H. DESMOND BYRNE
108 Texas Lane,
Ithaca, New York 14850

Does "the Gap" Really Exist?

Margaret Mead in "The generation gap" (11 Apr., p. 135) asserts, "Nowhere in the world are there any elders who know what their children know." This is the sort of craven, trumped up assertion that leads the new generation to despise their elders. In many years of the practice of medicine I have had to encounter issues of life and death and make decisions affecting them. My husband, as a war correspondent, entered Hiroshima 30 days after the bomb fell. Our children have had nothing of this kind of experience with the real issues of life. They are content in knowing that we know far more than they and are in fact the happier for it. They are aware that their turn will come.

Mead states that all of us who grew up before the war are "immigrants in time." Of course. And so are our children, and so will be their children. For if we are not to regard life as but a treadmill, then it must be a pilgrimage with fresh encounters at every turn. The judgment upon us is the degree to which we meet these encounters with poise, courage, wit, determination, and steadfast faith. To be an "immigrant in time" is nothing new. It is common to all generations.

My husband and I and our children simply do not experience "the generation gap" and neither, I suspect, do many others. One reason is that we are one in our understanding that disappointment, sorrow, conceit, frustration are but a few among the evidences of human frailty. But there is also our common joy, which is our strength. For if human frailty is a universal . . . it can be celebrated with laughter, especially at ourselves. Laughter is a healing, conciliatory grace among all generations.

"We have to realize that no other generation will ever experience what we have experienced," Mead intones. So, history will cease to repeat itself! That *is* something new! How can one refute what is so obviously false?

Mead's major weakness is that she fails to take into account a radical distinction between adolescence and maturity. There are qualities in maturity that stand over, above, and beyond time, place, and culture; they are valid for all generations. To assign them a value equivalent to adolescent potherings is to betray maturity.

GUILA F. BEATTIE
Post Office Box 326,
Sherwood, Oregon 97140

Some of us who were involved in the public school education of this "new generation" might remember the group as being rather spoiled. At the time, this was somewhat understandable largely because their parents wanted them to have everything they didn't have as children. However, the very bothersome question to me now concerns the children of this rather spoiled generation. What real chance do they have?

NORMAN R. MOLLOY
Post Office Box 15,
Fontana, California 92335

Margaret Mead must know more history than her editorial reflects. "No generation has ever known, experienced, and incorporated such rapid changes, watched the sources of power, the means of communication, the definition of humanity, the limits of their explorable universe, the certainties of a known and limited world, the fundamental imperatives of life and death—all change before their eyes" [since 1939]. Really. Did no earlier generation observe a change from wood to coal and coal to oil power? From mail to telegraph, radio, and telephone communication? From Catholic to Protestant and from Medieval to Copernican, Darwinian, and Freudian definitions of humanity? See the limits of the known and habitable world vastly extended by the great explorers and pioneers? The certainties of limited rural, aristocratic, and Victorian worlds shattered? And just what "imperatives of life and death" has this generation discovered that were unknown at Golgotha, during the Black Death, at Sevastopol or Verdun? Mead seems to think that death (or, even more incomprehensibly, life) began at Auschwitz or Hiroshima. She should reread *Urne-Buriall* (*1*).

HAROLD ORLANS
Brookings Institution,
1775 Massachusetts Avenue, NW,
Washington, D.C. 20036

Reference

1. T. Browne, *Hydriotaphia, Urn-Burial* (Charles Brome, London, 1686); ———, *Urne-Buriall and Garden of Cyrus*, J. Carter, Ed. (Cambridge Univ. Press, New York, 1958).

"In the past there were always some elders who knew more—in terms of experience—than any children. Today there are none . . . There are no elders who know what those who have been reared in the last 20 years know about what the next 20 years will be."

It is obvious, therefore, that the children who alone know both the present and future should be the professors, and the professors who do not know should certainly sit under them as students. Since Mead herself is clearly included in her all-inclusive group of elders, we expect to hear no more from her since she admits that all children know more than she does. Goodbye, Margaret.

I cannot believe that Mead is correct. Perhaps I, a scientist, cannot bridge C. P. Snow's gap between the scientists and the humanists. If so, then Mead and other humanists who have related to the extremist "children" of our student population may be correct. Perhaps all children know more than any elder, as many outspoken students claim . . . but if I saw any evidence that such a conclusion is correct, I would resign my professorship, rematriculate, and study under new, young, sophomoric "children" professors.

Perhaps, on the other hand, Mead and other humanists who agree with the vocal sophomoric element of our college and university nonstudents (in the classical sense) represent the frustration of classical humanism. Perhaps professional philosophers, literary intellectuals, cultural anthropologists, and others, have at last been forced intuitively to realize the futility of personal opinion (all they have to work with). In such a domain, it is conceivable that a bright sophomore might be able to convince the professor that the child is the more knowledgeable.

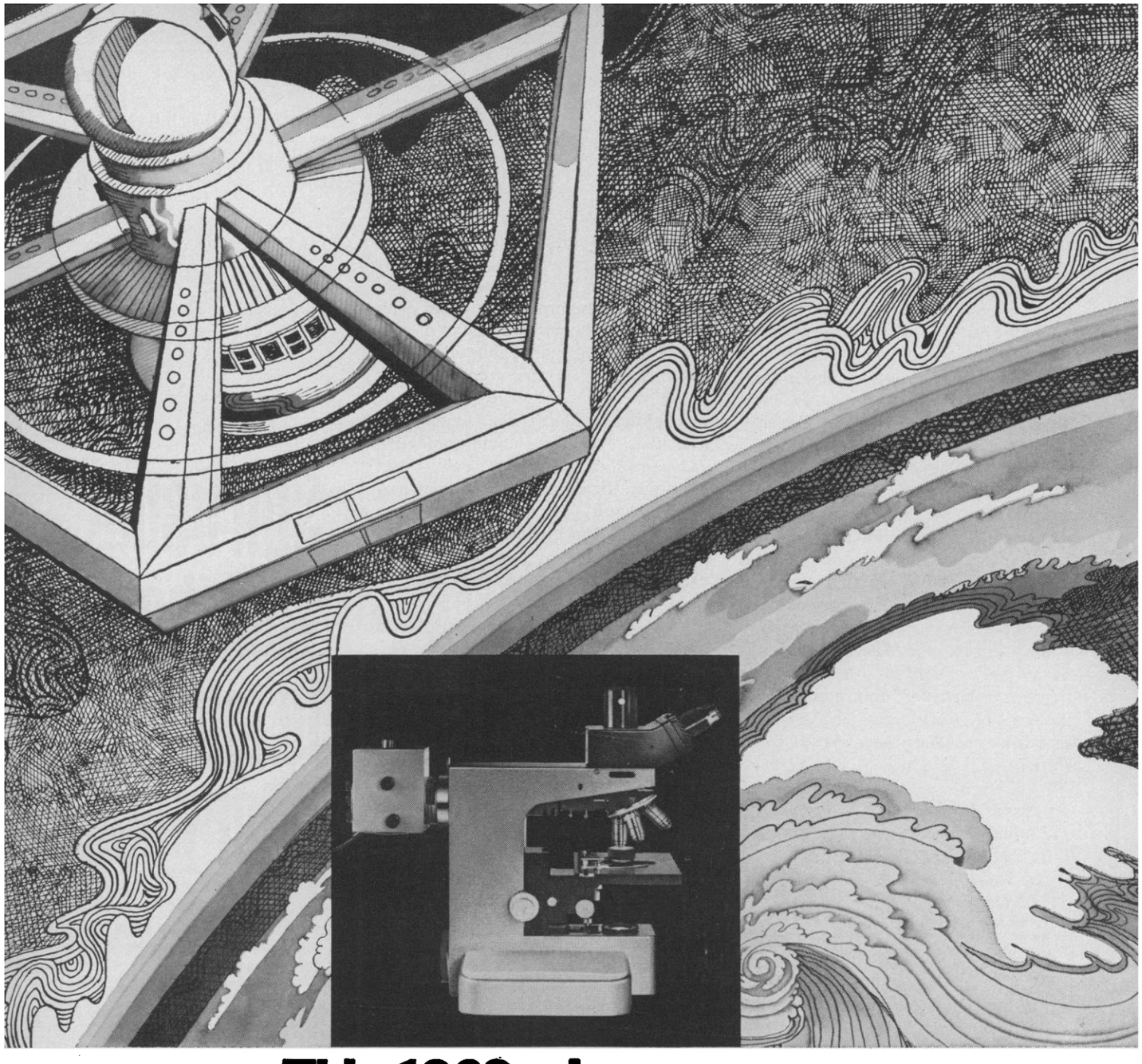
I doubt if any true scholar could make such a statement as Mead's. Scientific knowledge, for example, is only in part personal opinion; therefore it is not subject to debate in the sense of a discussion about student rights on the campus where anyone's opinion is as good as anyone else's. True scholars are sure that they know more than their "children" students and they (and I'm sure Mead speaks for few humanists, too) know that their knowledge is reliable and meaningful.

WALTER V. BROWN
Department of Botany,
University of Texas, Austin 78712

My commentators illustrate my point too well. I might add, however, that the editorial in *Science* was only a small section, selected by the editors of *Science*, from a series of lectures to be published as *Culture and Commitment* by the Natural History Press in the autumn. These lectures relate my conclusions from 44 years of fieldwork and analysis of field materials, something rather different from "personal opinion," better than a few paragraphs can do. I might also add that I am not a humanist and that I certainly intend to continue learning from my students.

It would have been interesting to have had some comments from the younger generation.

MARGARET MEAD
American Museum of Natural History,
Central Park West and 79th Street,
New York 10024



This 1969 microscope is so versatile it will take 1979 accessories.

And 1989 accessories, too. We make sure the ORTHOPLAN *never* becomes obsolete by constantly developing new accessories for it.

Right now, the ORTHOPLAN takes plano objective lenses for biological and metallurgical applications, transmitted-light dark-field and incident-light dark-field attachments, photomicrographic accessories for 35 mm, 4″ x 5″ or Polaroid®. And it also takes different light sources—halogen and xenon, for example.

These are just a *few* of the available attachments that make this fine microscope the most versatile you can buy for your research.

The ORTHOPLAN stand is massive, rigid, and is specially designed so when you attach accessories like lamp housings, illuminators and camera equipment, they become an *integral* part of the microscope—and don't extend out in every direction.

The field of view is up to 2½ times greater than that of conventional wide-field microscopes. It's flat, *edge to edge*, and the image is superb, thanks to the famous Leitz plano objectives.

For more information, write:

Leitz®
E. Leitz, Inc.,
468 Park Avenue South, N.Y., N.Y. 10016

®TRADEMARK OF POLAROID CORPORATION.

72969

13 June 1969, Volume 164, Number 3885 **SCIENCE**

Contamination from the Moon

Recently a few scientists, as well as the New York *Times*, have questioned the adequacy of procedures attending the return of astronauts and samples from the moon. They suggest that forms of life resident there might contaminate the earth catastrophically. This is extremely unlikely.

Molecules such as H_2O, N_2, and CO_2 disappear rapidly once they reach the atmosphere. The unprotected surface of the moon, where the astronauts will touch down, is bombarded by the solar wind, x-rays, and ultraviolet light, and the temperature varies between about 100° and 400°K. Because of radiation and thermal degradation, nucleic acids and proteins would not remain intact very long. The environment beneath the surface of the moon is less harsh but still not conducive to life. At depths of a meter or more the temperature always remains much below the melting point of H_2O. Near the surface there is a level where temperatures vary above and below the freezing point in response to the influence of the lunar cycle. In this region, however, free H_2O, O_2, and CO_2 quickly diffuse to the surface. Without renewable energy sources, life perishes, for the degradation of organic matter proceeds slowly but inexorably even at 273°K.

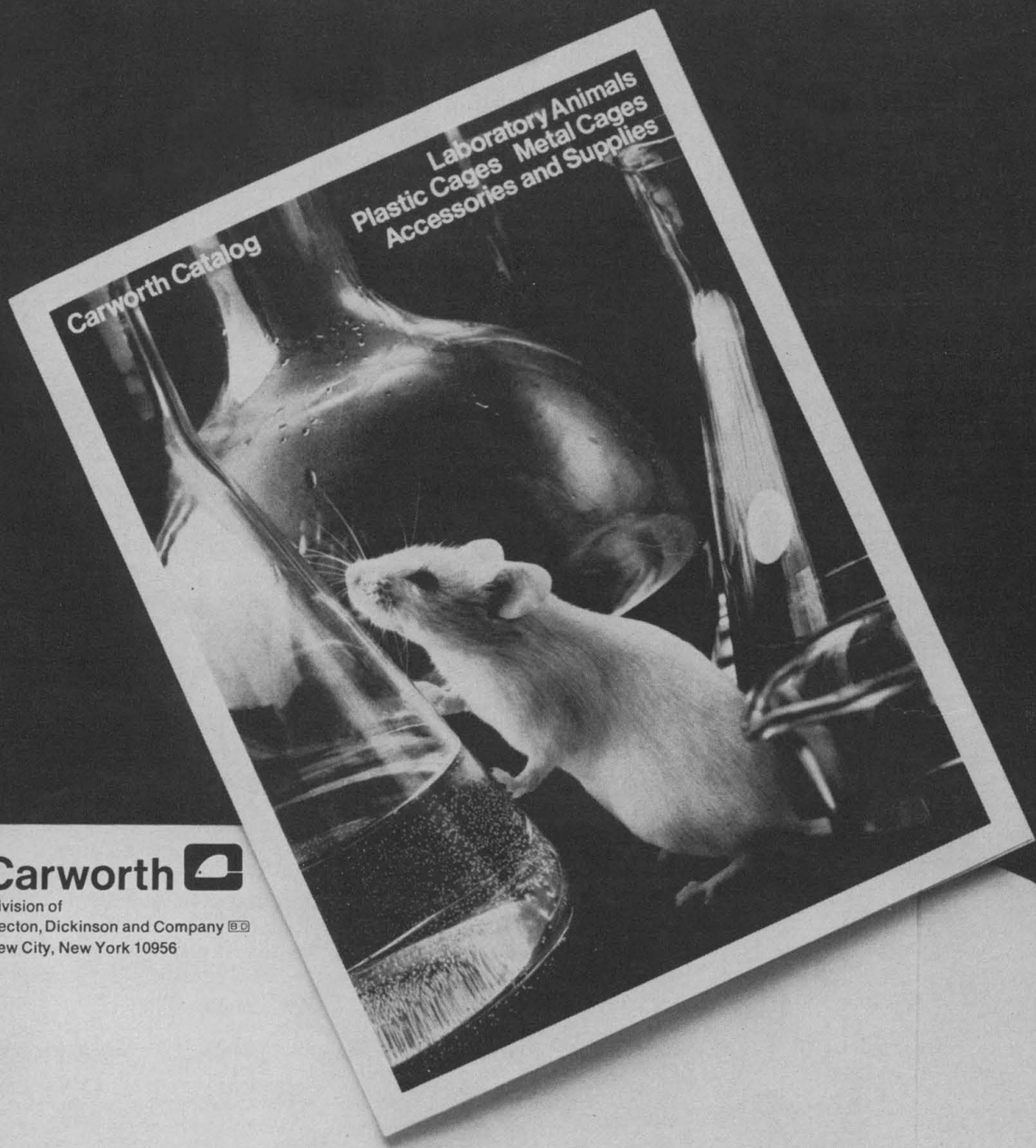
There remains, of course, a formidable collection of hobgoblins. They include such types as life based on silicon and living forms as yet undescribed. Given the vague nature of such organisms, logic is a poor weapon. You can't prove a negative. One argument is that a form of life adapted to the absence of H_2O, O_2, and organic compounds could scarcely be expected to survive on earth, much less infect earth's creatures. The most compelling argument, however, is that the lunar-return experiment has been conducted many times in the past. It has been estimated that millions of tons of unsterilized lunar material have reached the earth as a consequence of meteor impact.

Once the specter of contamination from the moon had been raised, quarantine procedures were inevitable and justifiable. The Public Health Service, the Department of Agriculture, and the Department of the Interior are charged with protecting humans, agriculture, and wild life. For example, "Whereas the unregulated movement of means of conveyance, their stores, . . . earth, stone and quarry products . . . into . . . the United States from places outside thereof . . . may disseminate plant pests. . . . No soil shall be moved . . . into the United States except as authorized. . . ."

A large number of scientists have devoted much effort to the quarantine problem during the past 5 years. Sterile containment of lunar specimens during the journey to Houston is assured. At Houston a Lunar Receiving Laboratory (*Science*, 3 February 1967) has been specially constructed to house astronauts during a 3-week quarantine period and to facilitate extended examination of the lunar samples. Attempts will be made to culture organisms on many different media, and various living forms will be exposed to powdered portions and extracts of the returned samples.

Procedures involving the astronauts are more controversial. Careful effort to keep to a minimum the amount of adventitious material returned to earth is a substantial factor in the procedures that have been adopted. The astronauts face a difficult and dangerous mission. Were their procedures to be made even more complex because of panicky, last-minute objections, their chances of a safe return could be needlessly jeopardized.—PHILIP H. ABELSON

We saved one of these for you, but we don't know where to send it.



Carworth
Division of
Becton, Dickinson and Company
New City, New York 10956

Carworth, New City, N.Y. 10965

Please address my copy as follows:

Name_____

Title_____

Dept._____

Institution_____

Address_____

_____

city state zip