SCIENCE 12 December 1969
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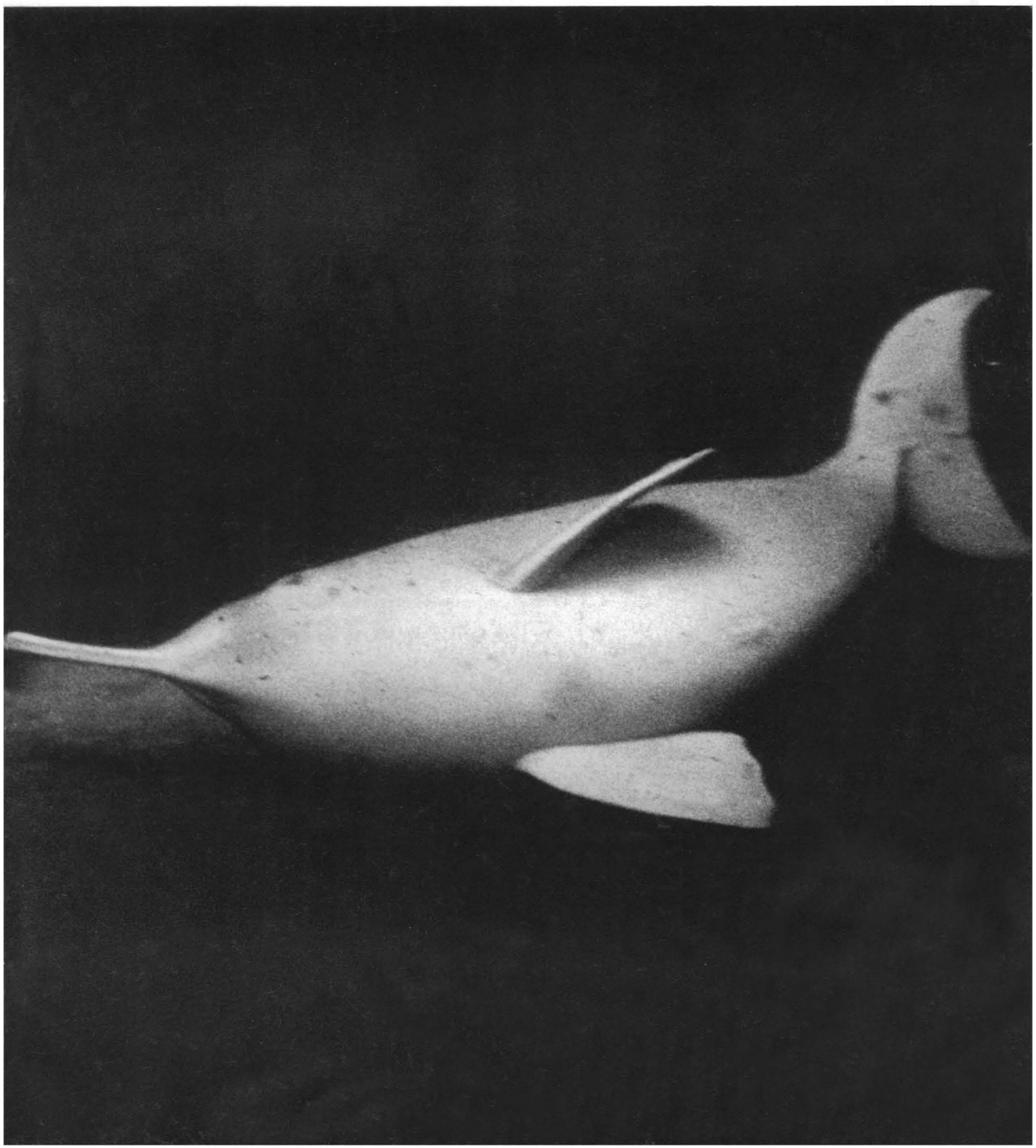
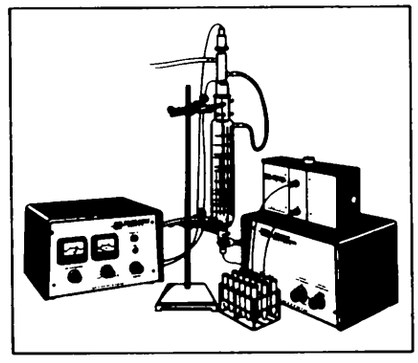
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Ampholine Electrofocusing equipment,
including Power Supply
and Uvicord ultraviolet Monitor
ready for protein separation.



LKB IN THE SERVICE OF SCIENCE

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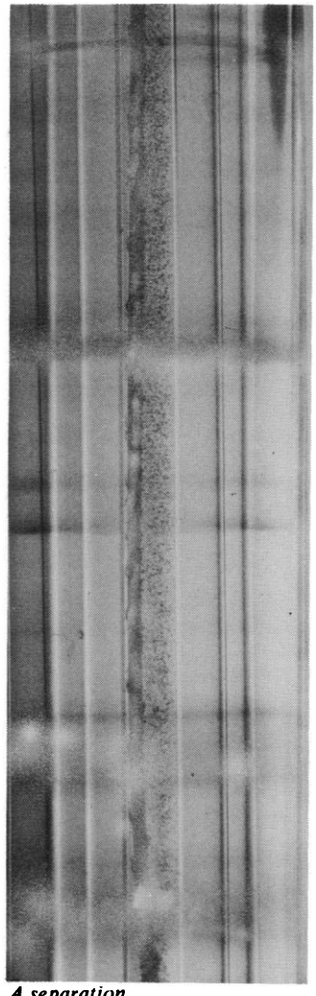
SALES AND SERVICE THROUGHOUT THE WORLD: STOCKHOLM, THE HAGUE, COPENHAGEN, ROME, VIENNA, LONDON

PROTEIN | Separation Purification Characterization



A separation of chicken haemoglobin.

Research establishments, hospitals, and industry throughout the world have used LKB Ampholine Electrofocusing to successfully separate the following kinds of protein.

Endotoxins from bacteria (lipopolysaccharides)
Capsular polysaccharide from H. Influenza
Urine gonadotrophins of pregnancy (human)
Pituitary hormones
Amonuim Sulfate preparations of human serum
Blood coagulation proteins, namely FXII
Whole serum
Gamma globulin
Steroid binding γ-globulin
Transcortin cortisol binding β_1 globulin
γ-globulin, transferrins
Cytochrome c from beef heart
Biliverdin-protein in eel serum
Rat fetal protein from albumin
Immunoglobulins
Bovine serum
Albumin
Ovalbumin
Intact platelet mebranes
E. coli nucleases
Enzymes catalyzing sulphydryl —disulfide interchanges
Enzymes-cellulases (some proteases)
Butyrylcholinesterases from human brain
Pancreatic enzymes
Bromelain+acid phosphatase from ananas comosus
Arylsulphatases of aspergillus oryzae
Mitochondrial transaminases
D-aspartic oxidase
Glycosidases from fungal or bacterial source
Lactoperoxidase
Invertase from yeast
Ribosomal
Catalase
Acid phosphotases
DNA polymerase
Enzymes of carbohydrate metabolism
Neurospora crassa invertase
Alkaline phosphatase in eel intestinal mucosa
For myltetrahydrofolate synthetase from clostridium thermoaceticum
Haemoglobin
Isoenzymes of alcohol dehydrogenase
Soluble grape proteins
Influenza virus and adenovirus
Herpes simplex virus proteins
Renin (ovine, human)
Insulin
Glycopeptides of fibrinogen and platelets
Chondroitin sulfate glycoproteins
Myoglobin
Ferritin
Chemically modified myoglobin
Interferon samples from chicken eggs
High and low molecular weight glycosidases. Detergent-soluble glycosyltransferases (membrane bound)
Extracellular enzymes and toxins from staphylococcus aureus e.g. hyaluronate lyase

Have YOU a research problem that can be solved by LKB

Ampholine?

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SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

First side-swimming cetacean, the blind river dolphin (*Platanista gangetica*). See page 1408. [Lloyd Ullberg, Steinhart Aquarium, San Francisco, California]

We began building computer-based systems before we designed our first computer. By now we've built more systems than almost anyone else. And more real-time systems than most of our competitors put together.

Some of our systems are for aerospace applications, like JPL's systems complex that uses 50 computers. Others are for biomedicine, seismology, telemetry, test and check-out, or simulation. And almost every one is unique.

This background lets you tell us your needs and relax. We'll turn them into a working system. And our software experience assures that tailored programs will work.

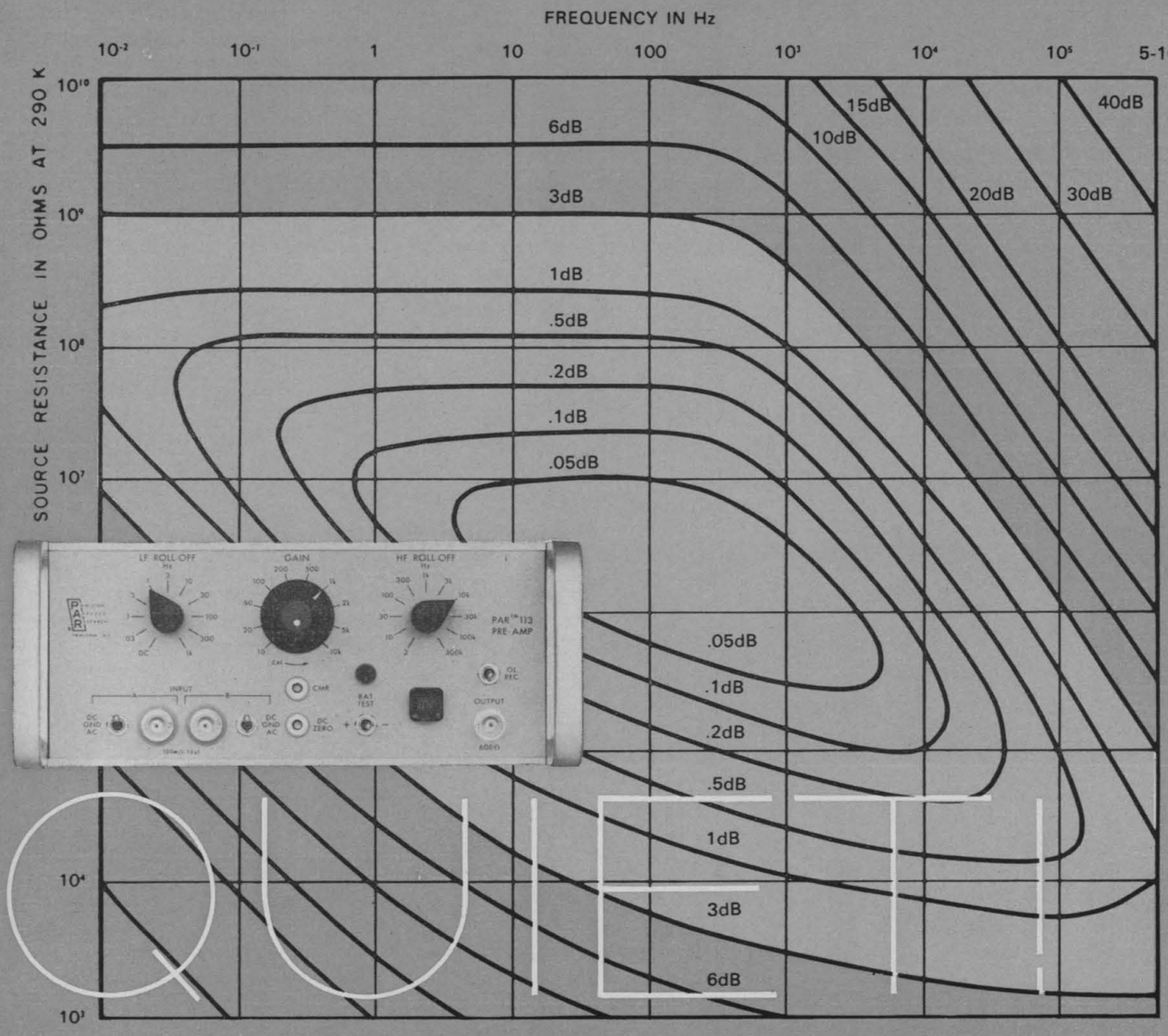
We also save customers money. Our modular hardware lowers engineering and construction costs. And because our computers were designed with systems in mind, their cost/performance cuts costs any time a high data rate or real-time requirement enters the picture.

These developments didn't happen overnight. We've invested years in them. Because without systems, we might be just another computer compan

Xerox Data Systems XDS

It isn't there just for looks.

Xerox DATA Systems, El Segundo, California.



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- Gain continuously variable from 10 to 25,000
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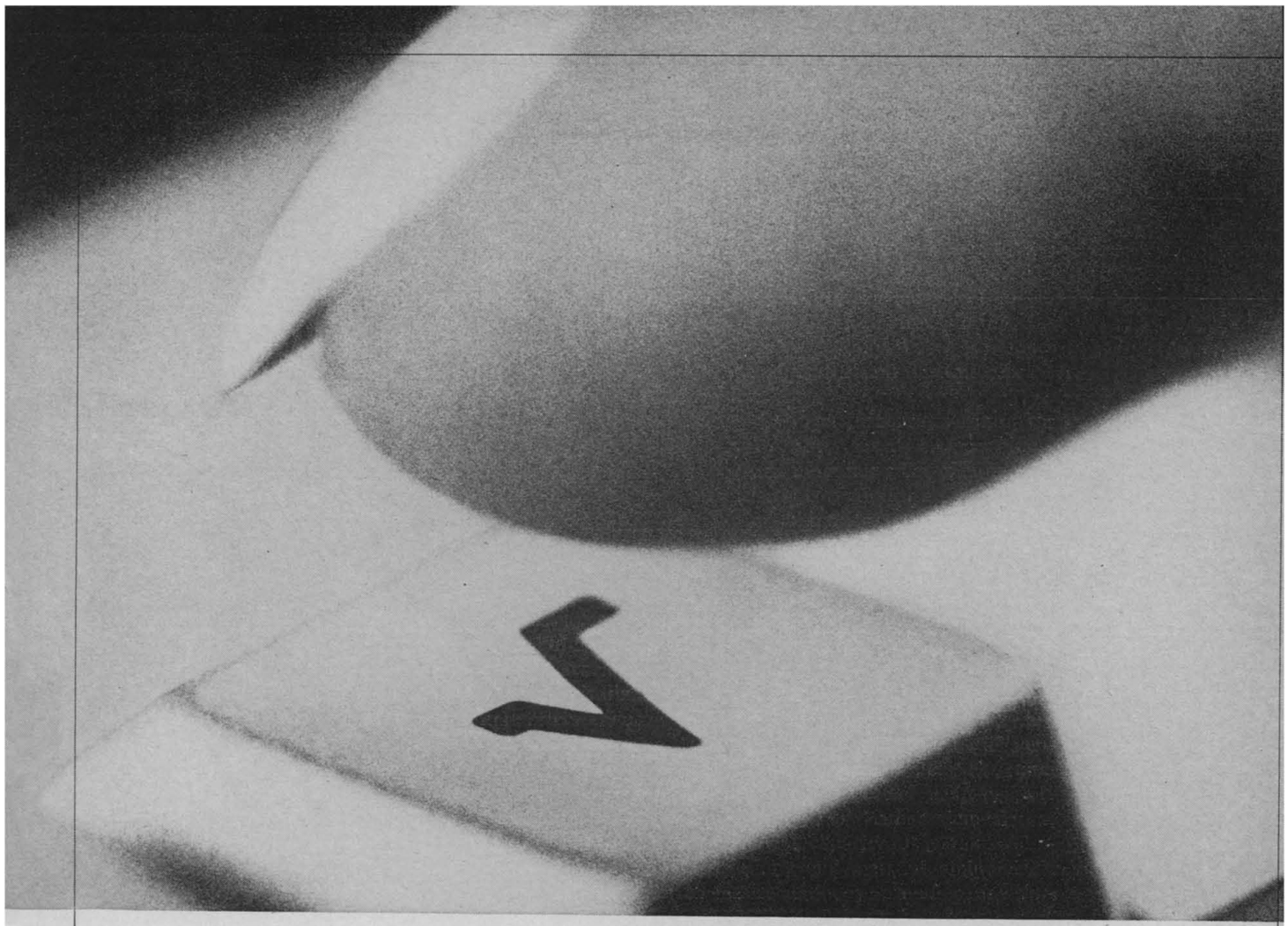

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The microscope gives you an unusually wide choice of lighting so you capture the specimen in the light that makes it show up best. The camera gives you automatic exposure control so you can concentrate on picture-taking instead of fiddling with controls or worrying about meter readings.

The camera is the new Leitz 4"x 5" bellows camera. It has a fully transistorized automatic exposure system, with a photomultiplier detector, and practically unlimited exposure range. You get exact exposure control independent of bellows extension, eyepieces and methods of illumination. Exposure can also be set manually.

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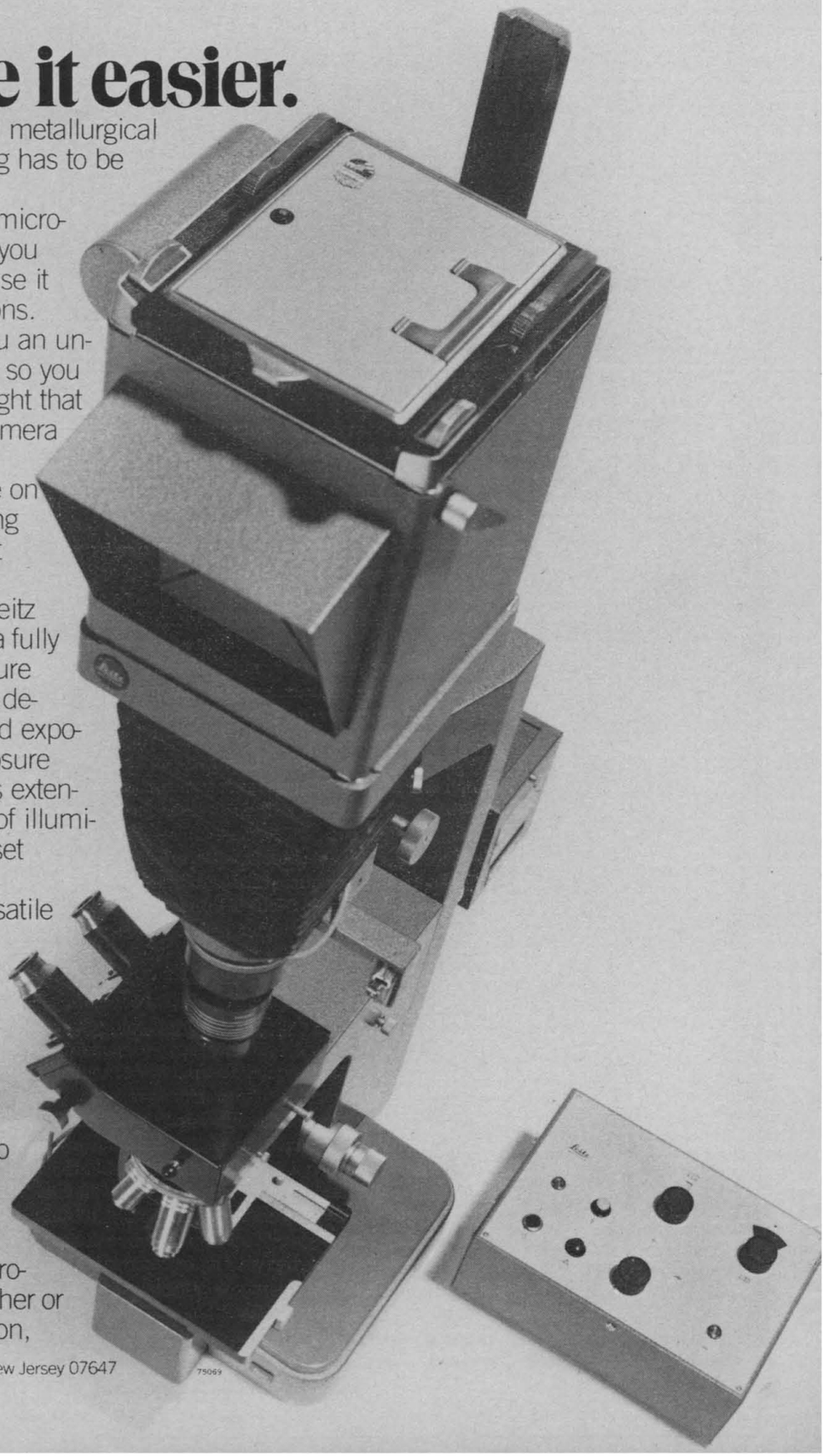
The field of view is flat, edge to edge, and large – up to 2½ times greater than that of conventional-field microscopes.

The camera and the microscope can be purchased together or separately. For more information, write: Leitz® E. Leitz, Inc., Rockleigh, New Jersey 07647



12 December 1969, Volume 166, Number 3911 **SCIENCE**

Open Letter

My dear Mr. President:

The substantial amount of uncertainty that exists concerning future plans and future funding levels for research and other scientific activities suggests that it would be useful to have an authoritative statement of the science policies of the federal government.

Discussions with staff members of federal agencies indicate that some of them share the uncertainties concerning the future that are widely expressed outside of government. The preparation of a statement of federal science policy—which would require agreement among the Bureau of the Budget, the Office of Science and Technology, and perhaps other offices that are responsible to you for national planning—would therefore help to clarify several problems that now make it difficult for the whole scientific community, in and out of government, to plan for the next several years.

I have in mind such matters as:

► the criteria for choice among alternatives, not all of which can be supported;

► the possibility of assigning a larger share of research-supporting responsibility and funds to the National Science Foundation, in view of the number of research programs NSF has had to take over from other agencies and of the objections being expressed in Congress and on some university campuses to Department of Defense support of research in the universities;

► possible changes in the nature and size of graduate fellowship and traineeship programs that may be indicated by the changing supply-demand relationships for scientific personnel and the forward time scale on which the planning of these programs is based;

► the apparent diminution of emphasis on basic research and training in the area of biomedicine at a time when the need for major and long-range improvements in medical services is being widely urged; and

► the fact that federal appropriations for research and development are not keeping up with rising costs.

This list is not intended to be exhaustive, but these are examples of issues that need clarification.

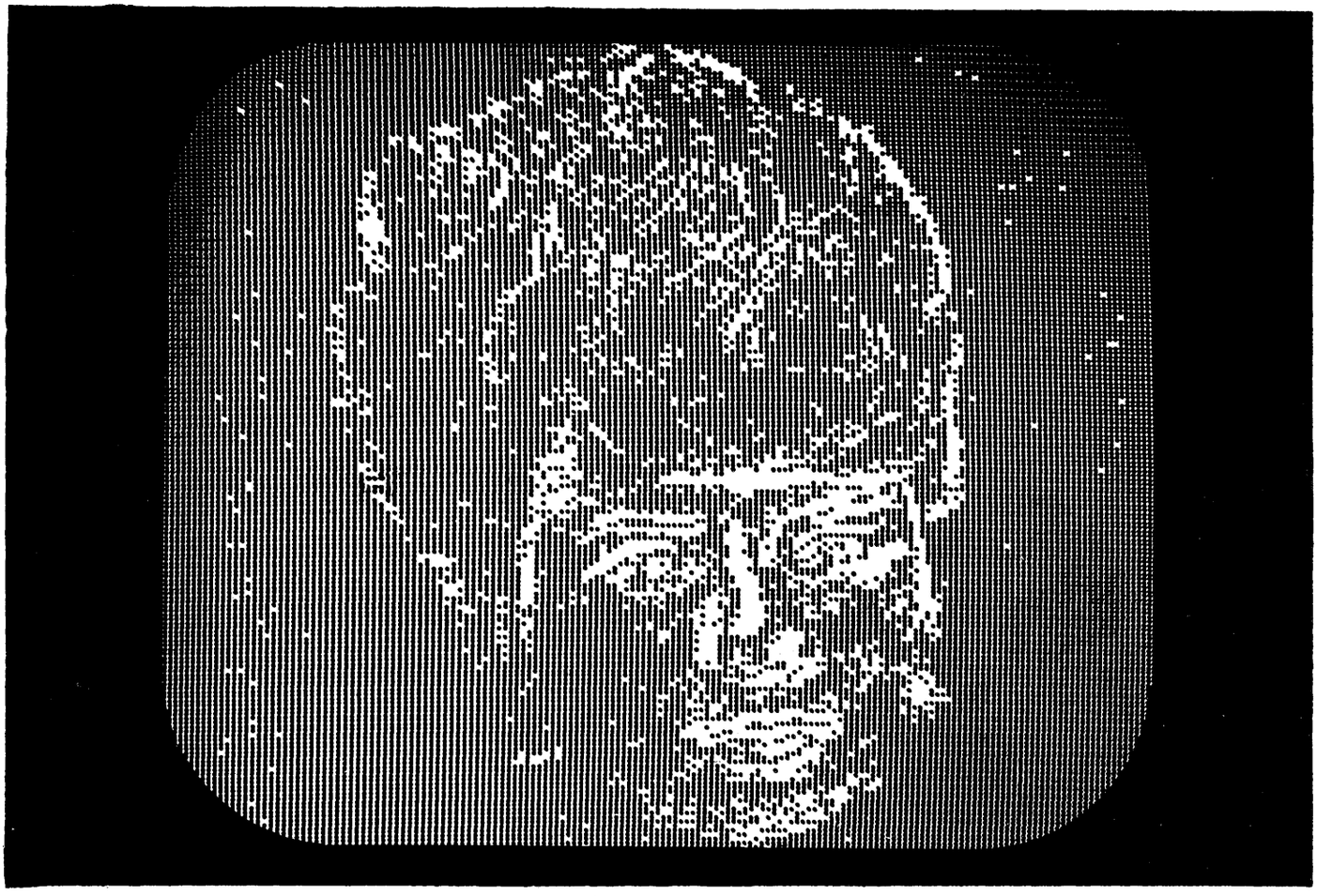
Two Presidents of the United States were members of the American Association for the Advancement of Science, and one, Herbert Hoover, maintained his membership for over 60 years. It was at a meeting arranged by the AAAS, in cooperation with the National Academy of Sciences and the Alfred P. Sloan Foundation, that President Eisenhower announced his decision to recommend to Congress that the federal government finance construction of the large linear accelerator at Stanford University as a national research facility. *Science*, the weekly magazine published by the Association, has frequently been the medium of discussion of science policy problems by your science adviser and his predecessors, by other members of the executive and legislative branches of government, and by scientists outside of government. It would be an appropriate place to publish a statement of the science policies of your administration. I believe that the publication of such a statement would help to focus discussion on the major issues involved.

Sincerely,

Dael Wolfle

Dael Wolfle
Publisher

The Honorable
The President of the United States



Transmitting the changing scene

This girl's picture was produced on a special Picturephone® system; it will never look like this in your home. The white areas mark the only picture points which changed in 1/30 second (the duration of one video frame). The remainder of the picture was blanked out.

This emphasizes how Picturephone use differs from ordinary television: the Picturephone camera usually points at a single scene throughout a call and most of the motion is confined to the subject's lips and eyes. Everything else—perhaps 90 percent of the picture—remains stationary.

Frank W. Mounts of Bell Laboratories used this fact to design an experimental video system that may make it possible to transmit three Picturephone calls over a channel that otherwise could carry just one.

An ordinary Picturephone system sends thirty complete pictures each second. In Mounts' experimental system, only changes from one picture to the next are transmitted. A complete picture (information about dot positions and brightnesses) is stored at both the transmitting and receiving ends. As the camera's electron beam scans the original image, the brightness at each point is compared with the stored value. Whenever there is a significant difference, the system updates the stored frame and transmits the new brightness level and dot position.

At the receiving end, as the picture tube's beam arrives at each point, the incoming information is checked to see whether a picture-point revision has arrived. If so, it is displayed and stored.

Because some areas of the picture do not change, while others change extensively, revised points may come in bursts. Transmitter buffers smooth the flow by reading the information out onto the line at a constant rate.

This new technique, one of several now being investigated at Bell Laboratories, promises to help keep transmission costs down when the Picturephone service becomes generally available.

From the Research and Development Unit of the Bell System—

Bell Labs

tions of Polyamines Conf., New York, N.Y. (L. R. Neville, New York Acad. of Sciences, 2 E. 63 St., New York 10021)

9–10. **Metal Cleaning** Symp., Cleveland, Ohio. (W. M. Mueller, American Soc. for Metals, Metals Park, Ohio 44073)

9–10. National Conf. on **Rural Health,** 23rd, Milwaukee, Wis. (B. L. Bible, Council on Rural Health, 535 N. Dearborn St., Chicago, Ill. 60610)

9–11. American Assoc. for **Cancer Research**, Philadelphia, Pa. (H. J. Creech, The Association, 7701 Burholme Ave., Philadelphia 19111)

10–12. American Soc. of **Internal Medicine**, Philadelphia, Pa. (E. E. Daieske, 525 Hearst Bldg., 3rd at Market, San Francisco, Calif. 94103)

12–17. **Biomedical Engineering** Soc., 2nd annual, Atlantic City, N.J. (D. S. Gann, Case Western Reserve Univ., Cleveland, Ohio 44106)

12–17. Federation of American Societies for **Experimental Biology,** Atlantic City, N.J. (J. F. A. McManus, FASEB, 9650 Rockville Pike, Bethesda, Md. 20014)

12–17. American Soc. of **Hospital Pharmacists,** Washington, D.C. (J. A. Oddis, ASHP, 4630 Montgomery Ave., Bethesda, Md. 20014)

12–17. American Inst. of **Nutrition,** Atlantic City, N.J. (J. Waddell, 9650 Rockville Pike, Bethesda, Md. 20014)

12–17. American **Pharmaceutical** Assoc., Washington, D.C. (G. B. Griffenhagen, Div. of Communications, 2215 Constitution Ave., NW, Washington, D.C. 20037)

13–15. International Symp. on **Very Long Baseline Interferometry,** Charlottesville, Va. (J. W. Findlay, Natl. Radio Astronomy Observatory, Edgemont Rd., Charlottesville 22901)

13–16. American **Industrial Health** Conf., Chicago, Ill. (H. N. Schulz, AIHC, 55 E. Washington St., Chicago 60602)

13–16. American Acad. of **Pediatrics,** Washington, D.C. (G. E. Hughes, 1801 Hinman Ave., Evanston, Ill. 60204)

13–17. American **Physiological** Soc., Atlantic City, N.J. (R. G. Daggs, APS, 9650 Rockville Pike, Bethesda, Md. 20014)

14–16. **Computer Graphics** Intern. Symp., London, England. (M. L. V. Pitteway, Computer Science Dept., Brunel Univ., Uxbridge, Middlesex, England)

14–16. Conference on **Nondestructive Evaluation,** Los Angeles, Calif. (J. A. Fellows, American Soc. for Metals, Metals Park, Ohio 44073)

14–17. International **Geoscience Electronics** Symp., 2nd annual, Washington, D.C. (R. Bernstein, IBM Corp., 18100 Frederick Pike, Gaithersburg, Md. 20760)

15. Idaho **Acad. of Science,** Pocatello. (M. J. Bigelow, Chemistry Dept., Idaho State Univ., Pocatello 83201)

16–18. **Nature of the Solid Earth,** Francis Birch Symp., Cambridge, Mass. (E. C. Robertson, U.S. Geological Survey, 8001 Newell St., Silver Spring, Md. 20910)

16–18. Ohio **Acad. of Science,** Wittenberg Univ., Springfield. (J. H. Melvin, 505 King Ave., Columbus, Ohio 43201)

16–18. **Population** Assoc. of America, Atlanta, Ga. (A. F. Ferriss, Russell Sage Foundation, 1755 Massachusetts Ave., NW, Washington, D.C. 20036)