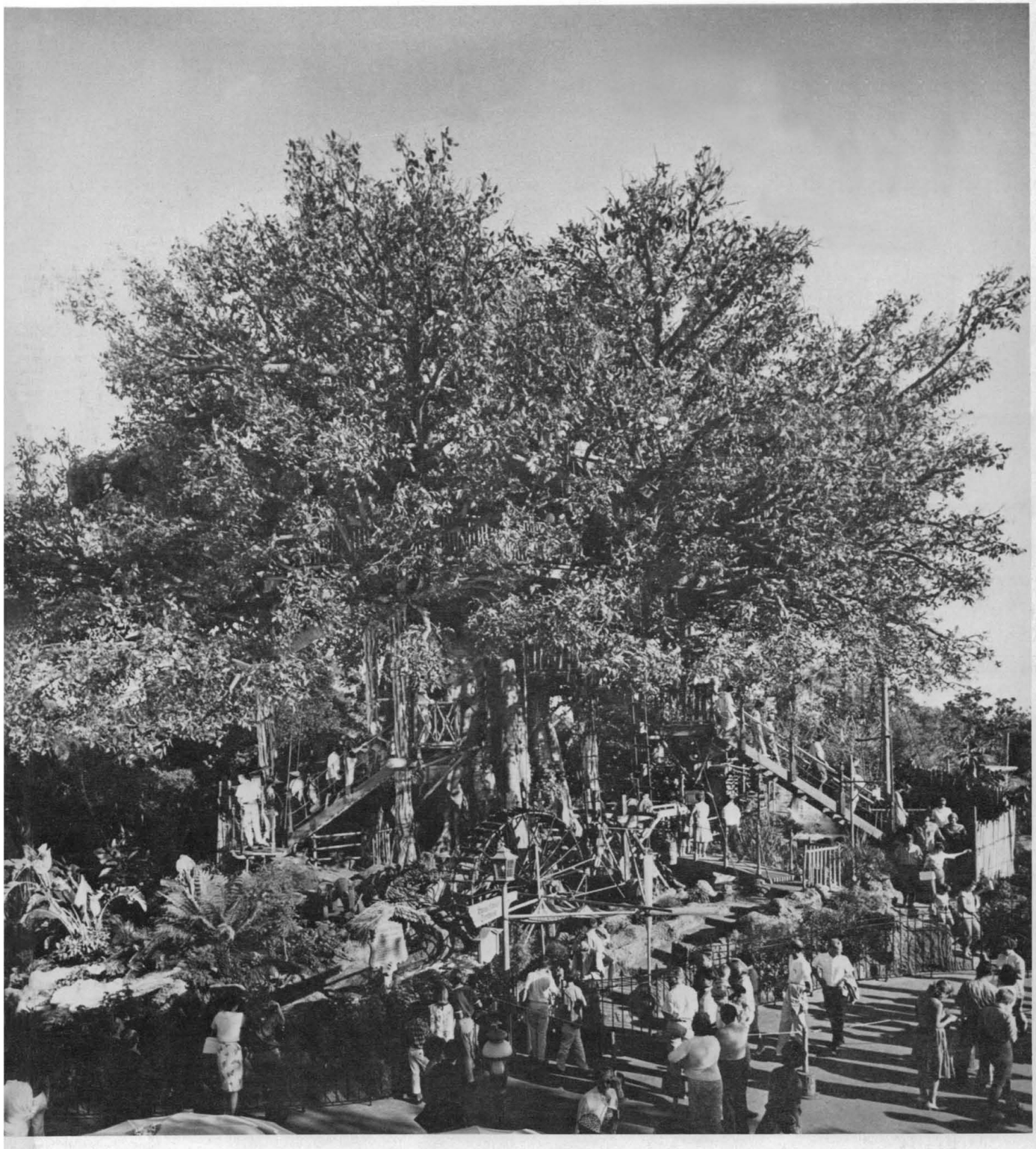
# SCIENCE

2 February 1973

Vol. 179, No. 4072

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

# I did 500 radioimmunoassays while I slept

The big, 500-sample capacity of the LKB-Wallac Automatic Gamma Sample Counter means that you, too, could set up for long uninterrupted runs overnight or on weekends. Come back in the morning and find a complete printout of results in digital form, with every sample positively identified. And with sample transfer taking as little as 10 seconds, you get fast results.

The LKB-Wallac Gamma Counter is simple to operate. You will be able to handle a high volume of samples for radioimmunoassays with a minimum of effort and at low cost. Samples can be added or removed from the counter at any time, without interrupting the run. They will always be positively identified. And you can add a binary-coded cap when you need to identify the samples of multi-users, or to give a command to your computer to select a certain program for processing the data from a group of samples.

Write now for information about LKB-Wallac Gamma Counters for either 300 or 500 samples, with one or two channels, for single or dual labelled samples.

LKB

**LKB Instruments Inc.**

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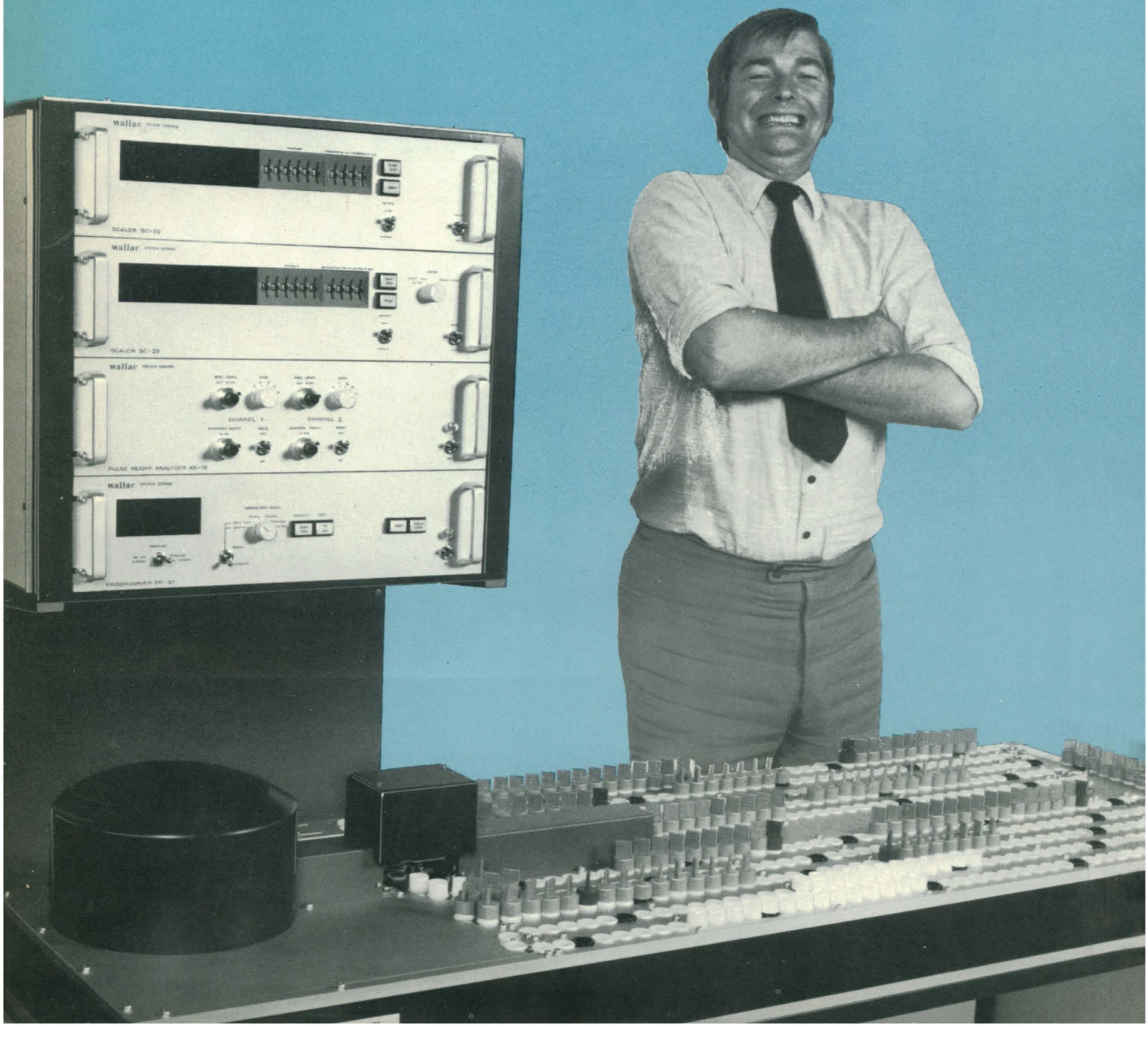
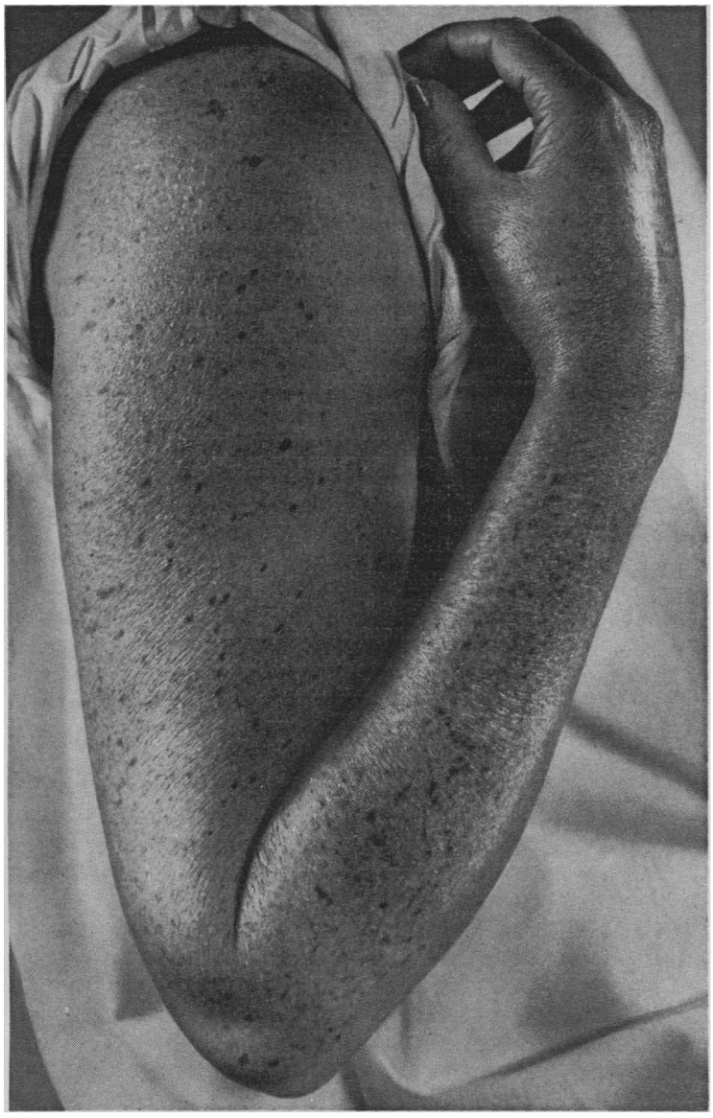
260 North Broadway, Hicksville N.Y. 11801





Kodak

*Armed with experience*

## In the cause of objectivity

Two of the three kinds of lighting are used in this example of medical photography: contour lighting to show the well-developed arm and forearm, texture lighting to depict the characteristics of ichthyosis vulgaris. Flat lighting is the third kind, and just as important in medical photography. Lighting is often the chief component of photographic style, but a glamorous photographic style is out of place in clinical photography.

*Many shops that carry extensive lines of photographic equipment and supplies stock the new* KODAK *Data Book "Clinical Photography" (cover price, $2.95). In a mere 118 thoroughly illustrated pages it summarizes decades of personal experience and consultation in the field by a recently retired Kodak man who once served his stint as president of the Biological Photographic Association. Assuming some understanding of cameras and sensitized materials, he writes to would-be medical photographers and medical people of all ages who strive to make the practice of medicine ever more objective.*

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## Sharing chemical thought

Ask ten reasonably alert citizens at random for their conceptions of what a research chemist does at work. Then ask ten research chemists how they spend their working day. Compare. Note that the real eyestrain comes not from staring at test tubes and instrument dials but at publications, reports, and patents from other chemists.

To reinvent the wheel is humiliating, wasteful, and (if the patent on the particular wheel hasn't expired) financially perilous. Hence the rise of chemical documentation, an underappreciated discipline not lacking in intellectual challenge of its own.

As a major investor in chemical research, Kodak does appreciate chemical documentation and has also invested quite a lot in the development of *that* discipline. Our returns on the latter investment safeguard our return on the former. Our contributions to chemical documentation stress "browsability" among structures. Superelegant, precise computer output must serve mere humans whose ideas of what they are searching for change even as they search.

We see at least two ways this could serve chemists other than our own or our industry's:

1. We are in the microfilm and microfilm equipment business. Got it going, in fact. Back then in 1928 it was hardware and film. Nobody thought of them as mere tools of something called "information technology." Today information technology has few worthier tasks than to keep chemistry from sinking of its own weight. Our thinking in this direction has had to go deep beneath the generalities. It may be worth sharing.

2. We also conduct an entirely different kind of business in custom production of compounds not generally available beyond laboratory quantities. In serving prospective customers of *that* business, our chemical information resources are no less important than equipment and the skills to operate it.

*Inquiries in either area can be addressed to Kodak, Dept. 55W, Rochester, N.Y. 14650—the more specific the more welcome. Requests merely to "send literature" will only mystify us.*

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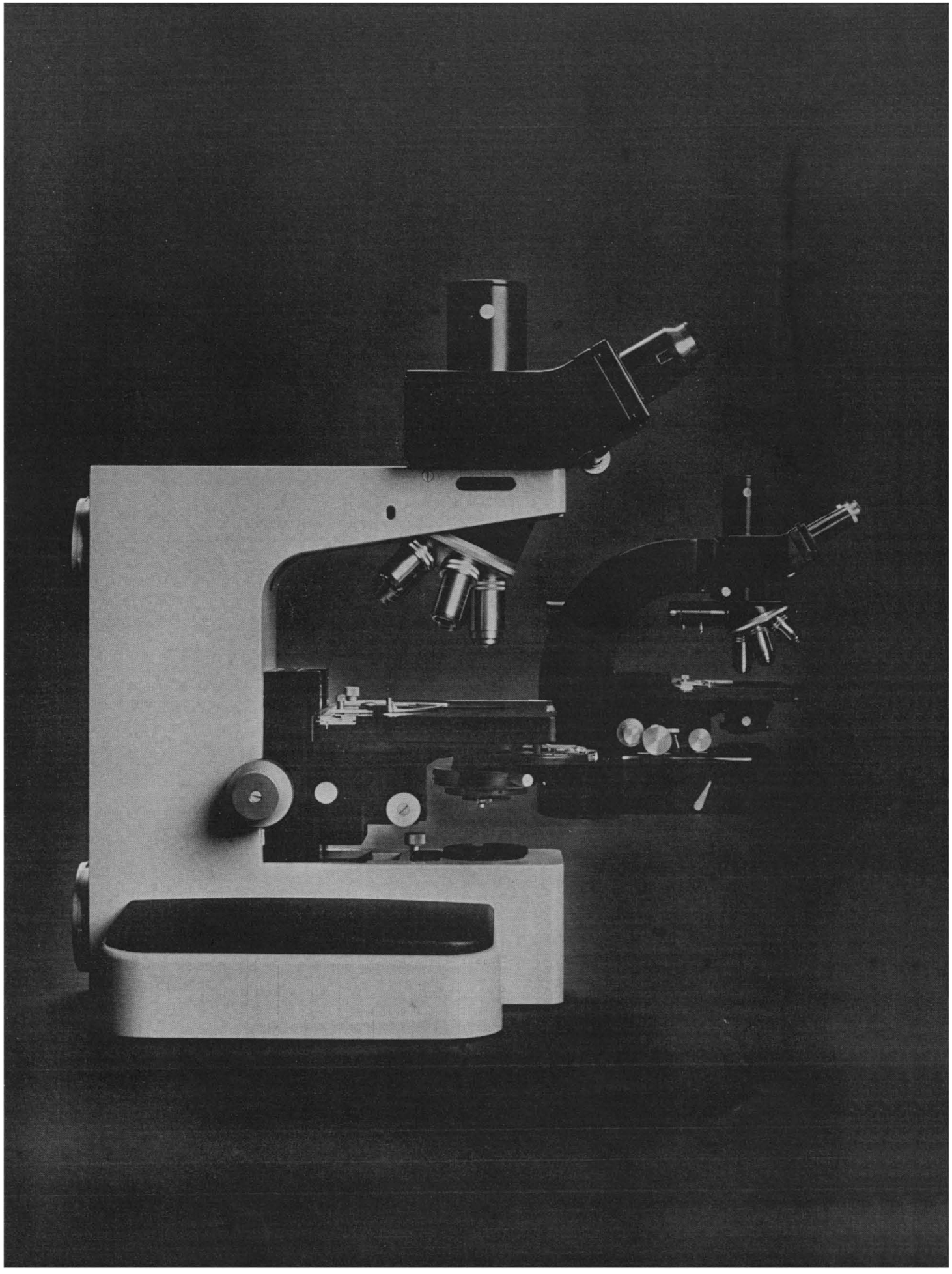
**COVER**

Swiss Family Robinson Treehouse, Disneyland, California. The tree has 150,000 handmade leaves and blossoms; its steel roots extend 40 feet below ground. See "What's wrong with plastic trees?," page 446. [Disneyland, Anaheim, California]



# Why all microscopes will soon be square.

Right now you have your choice of two different types of microscope: round or square.

And in the last year or so, your choice of "squares" has been increasing.

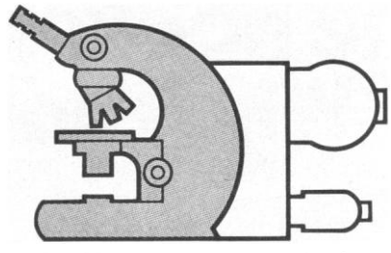
For some very good reasons.

Microscopes are no longer just microscopes. They've become sophisticated systems. Today, our Orthoplan for example, consists of over 1,000 components and accessories.

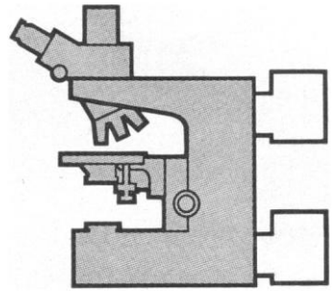
As the demand for specialized options has increased, it has become increasingly difficult to fit the flat surfaces of the various components to the curved microscope stand. A solution has been the "adapter." But this has only been a short-range solution. And it complicates both fitting and maintenance.

In 1964, we took our first big step towards a long-range solution to the problem. It involved the introduction of a completely new design. A design that used straight lines instead of curves. A design that substituted a systematic building-block approach for the jury-rig engineering of the past.

Since that time we have used the same approach in redesigning our entire line of microscope stands, components and accessories. Today, every multi-component Leitz microscope system looks like a single homogeneous instrument. Interchanging components and accessories is easier. And correct alignment is assured.



**The old way:** Use "adapters" to fit components to curved stand.



**The new way:** Start with a square shaped stand and add square components.

The advantages of this new design are at long last beginning to attract some followers. And we predict that soon, you will only have one type of microscope to choose from. Square.

If you're considering a new microscope perhaps you should start with the shape of the future. Not the past.

Write for a brochure. E. Leitz, Inc. Rockleigh Industrial Park, Rockleigh, New Jersey 07647.

**Leitz.**

Where most new developments start.

If he's not one of our computer salesmen, that's the one thing he probably won't bring up.

Because he probably can't bring anybody over to do it for you.

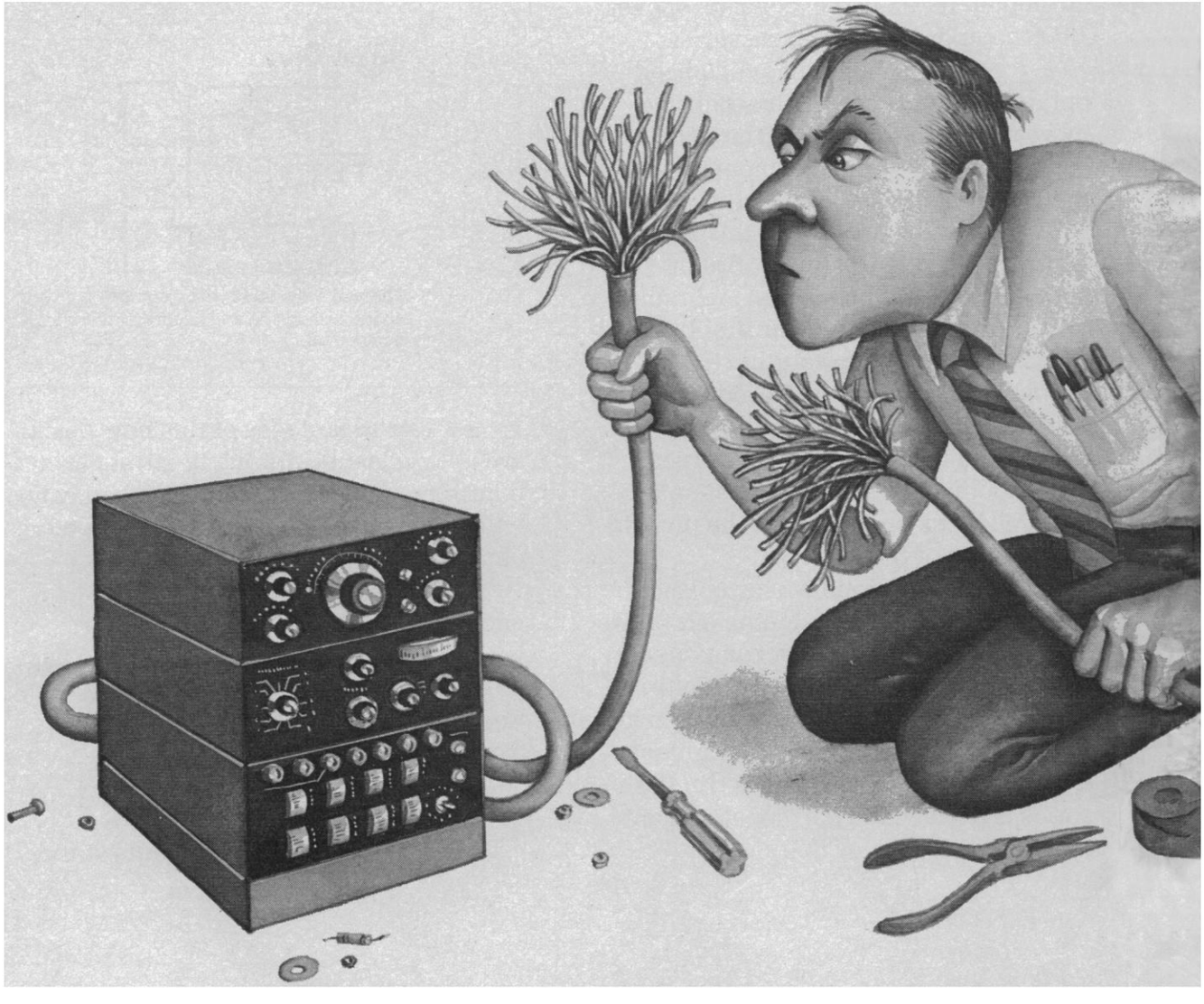
But we can.

And we will.

And we'll bring over all the modules (including special modules), labs, wire wrap service, cabinets, hardware, assembled logic arrays, terminals and technicians it takes to do the job.

For us it's easy, because our Logic Products Group makes it all themselves, or gets what they need from one of our other groups, so it all fits together when it gets there.

# When you buy a computer the hooker in the deal can be "Who's going to hook it up?"



We can do it because we've had, we've got, and we keep getting the kind of designers, engineers and logic people it takes to make and market more kinds of computers, and everything it takes to make a computer work right, right from the start, than any other computer company in the world.

We're the Logic Products Group, Digital Equipment Corporation, Maynard, Massachusetts 01754/(617) 897-5111 (Ext: 2785) in the U.S.

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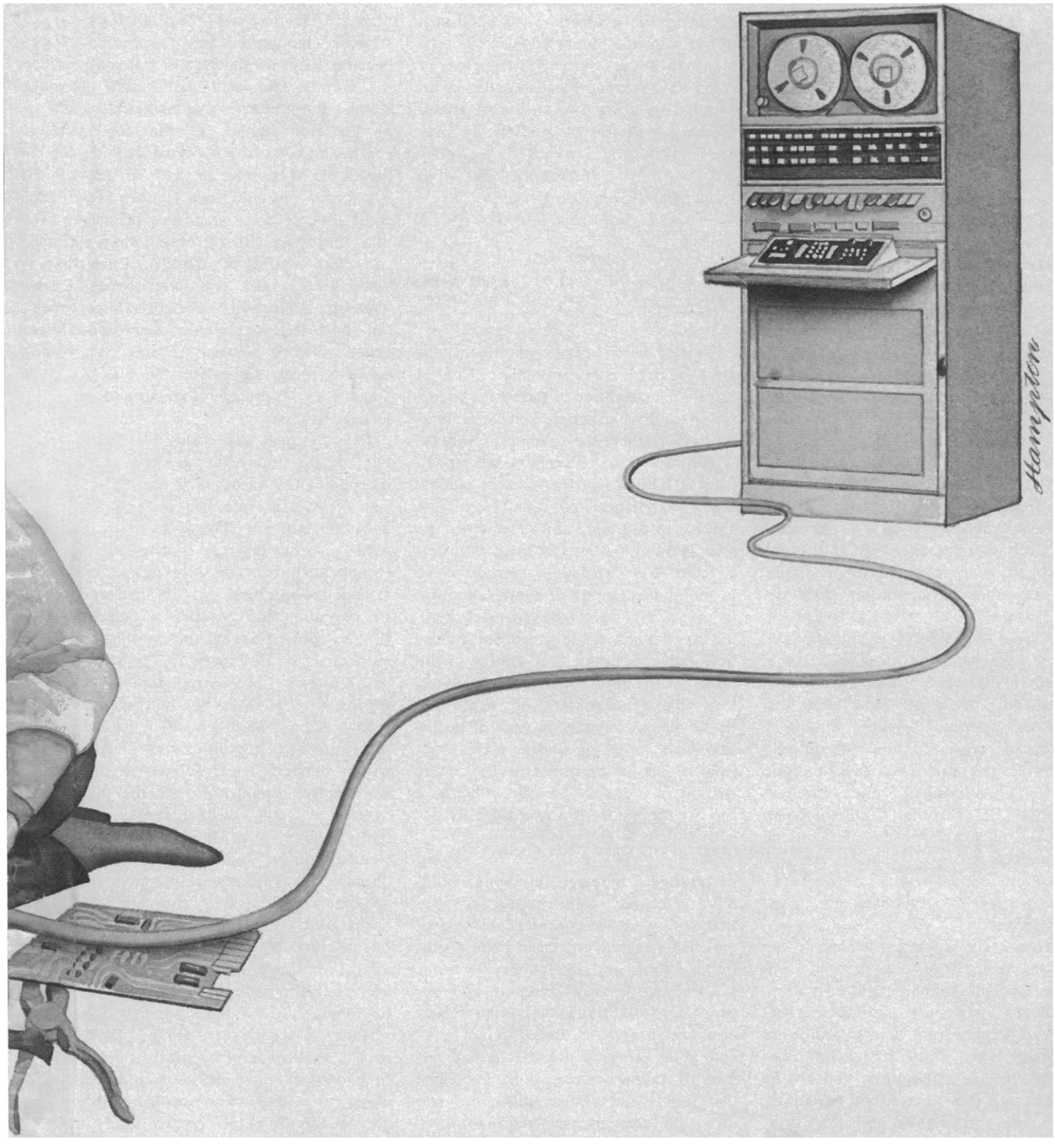


2 February 1973, Volume 179, Number 4072 **SCIENCE**



# Discovery and Evaluation of Resources

Slowly mankind is fashioning means to facilitate better management of the earth. An important tool that has not received appropriate recognition is the Earth Resources Technology Satellite (ERTS). Its imaging systems furnish information concerning agricultural and forest resources, mineral and land resources, water resources, marine resources, and land use. This satellite, which has been in orbit for about 6 months, has already provided tens of thousands of photo-images of all regions of the globe.

ERTS flies 920 kilometers above the earth in a circular orbit that is nearly polar. It orbits the earth 14 times per day: each pass covers a region 185 km wide, and there is some overlap among them. After 18 days the satellite returns to the same position, having covered the entire globe. In its sun-synchronous orbit, ERTS crosses the equator on each southward pass at 9:42 a.m. Eastern Standard Time.

Most of the data from the satellite have come from a multispectral scanner subsystem that views an area 185 by 185 km in four wavelength bands. These are the green [500 to 600 nanometers (nm)], red (600 to 700 nm), near infrared (700 to 800 nm), and a second infrared (800 to 1100 nm). Various objects and materials tend to behave quite differently in the various bands. For example, water is relatively transparent in the green, but appears black in the infrared. In contrast, vegetation reflects extremely well in the infrared and is as bright in that wavelength region as snow is in the visible region. The brightness of vegetation in the infrared depends on the type of vegetation (for example, big leaves or small ones). It also depends on the health of the plants—healthy crops appear much brighter than does diseased vegetation.

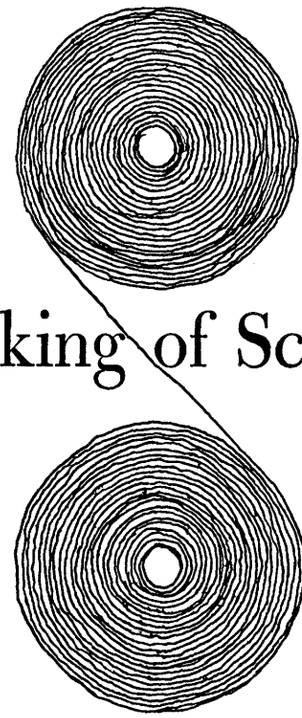
The images obtained in the various wavelength regions are transmitted directly to earth when the satellite is over the United States. At other times, the images are stored on magnetic tapes for readout when in range of U.S. stations. Subsequently, the individual images can be combined to form artificial color composites. Investigators have become skilled in interpreting these composites and can recognize different kinds of vegetation and terrains.

Repetition of the imaging every 18 days is a particularly valuable feature, for comparisons of succeeding images can reveal highly significant changes. There are disadvantages and benefits in imaging a large area. Resolution is limited to about 100 meters, and the image as received is somewhat distorted. However, most of the distortion can be compensated for. An important advantage of portraying a sizable portion of the earth in one picture is that geologists have been able to identify features that previously had escaped detection.

A large number of investigators are now studying the images. Their studies were selected from among 600 research proposals. Of the 335 accepted, 70 were from scientists of foreign nations. Policy with respect to distribution of pictures is one of complete openness. Nationals of any country are free to purchase them at a nominal cost. Browse files have been established at many offices around the United States, with a major distribution center at Sioux Falls, South Dakota.

Many countries have displayed enthusiasm for the ERTS images. Canada is operating its own receivers. Brazil, Mexico, and Venezuela are moving toward establishing their ground stations. The Brazilians are particularly enthusiastic about ERTS, for it is giving them a first look at much of the Amazon valley. Their enthusiasm is likely to be contagious, and other developing countries will find ERTS a valuable source of many kinds of information.—PHILIP H. ABELSON

# Conversations With Outstanding Scientists



# Speaking of Science

The American Association for the Advancement of Science is pleased to announce a new educational resource for libraries and teachers of science. This provocative audiotape series should also be of interest to the general public and to scientists who want to remain up-to-date on advances being made in other fields of science.

The first offering in this continuing series features 12 informal conversations with more than 20 of America's leading scientists. These well-known men and women of science discuss The Mars Probe, Evolution and the Descent of Man, Advances in the Physical Sciences, Advances in Astronomy, Peace, and seven other timely and important subjects.

The 12 recordings are on six cassettes (one complete 30-minute conversation on each side) for playback on standard machines. They are packaged in a compact binder that will fit easily into a bookshelf.

The conversations are narrated by Mr. Edward Edelson, science writer for the *New York Daily News*, and Mr. Mitchell Krauss of *WNET-TV* in New York.

You are invited to purchase this new AAAS educational service at the low price of **$39.95**—AAAS member's price **$34.95.**

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Dr. Carl Sagan
(with Edward Edelson)

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