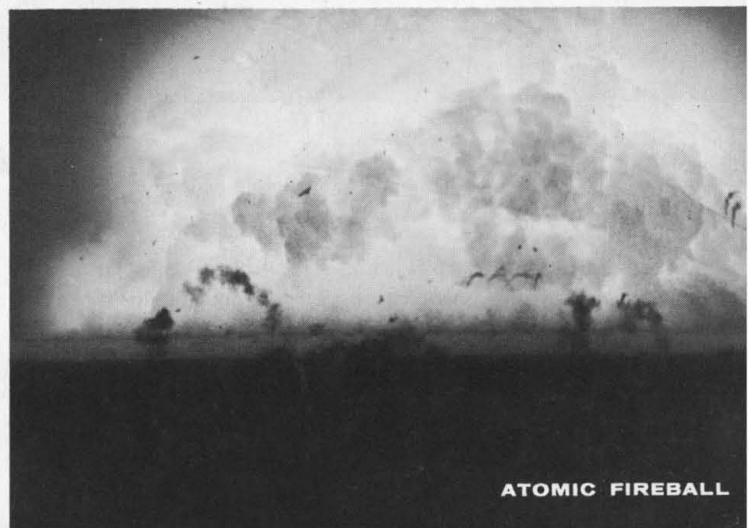
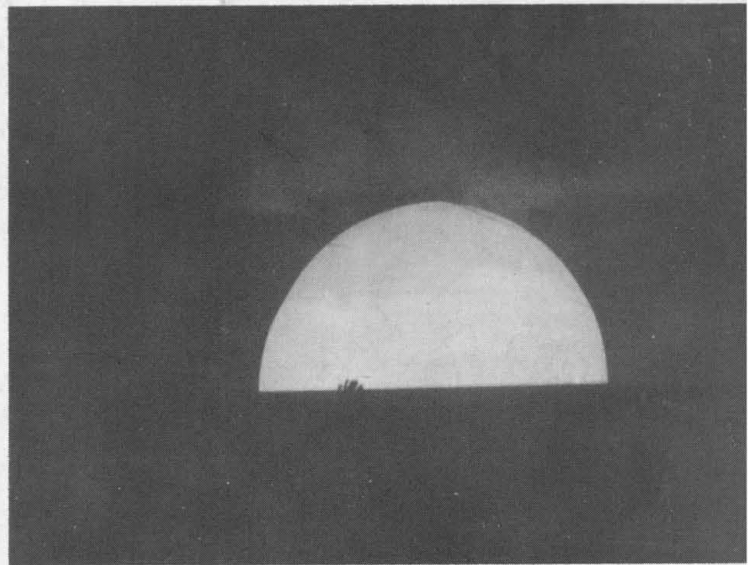
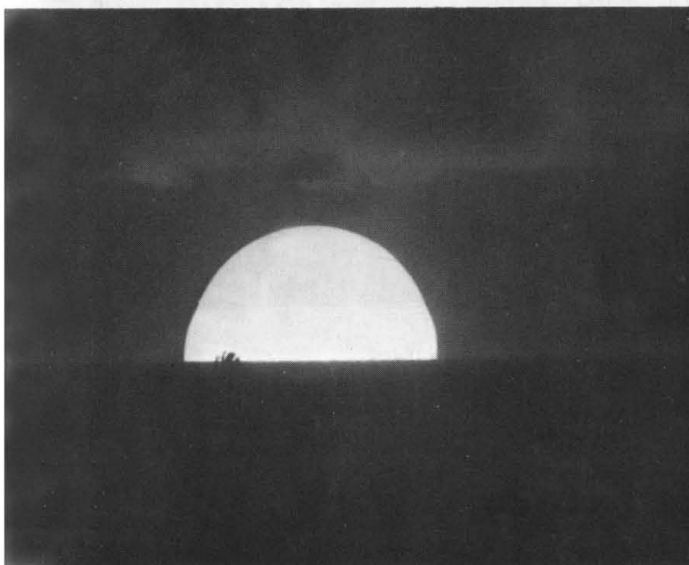


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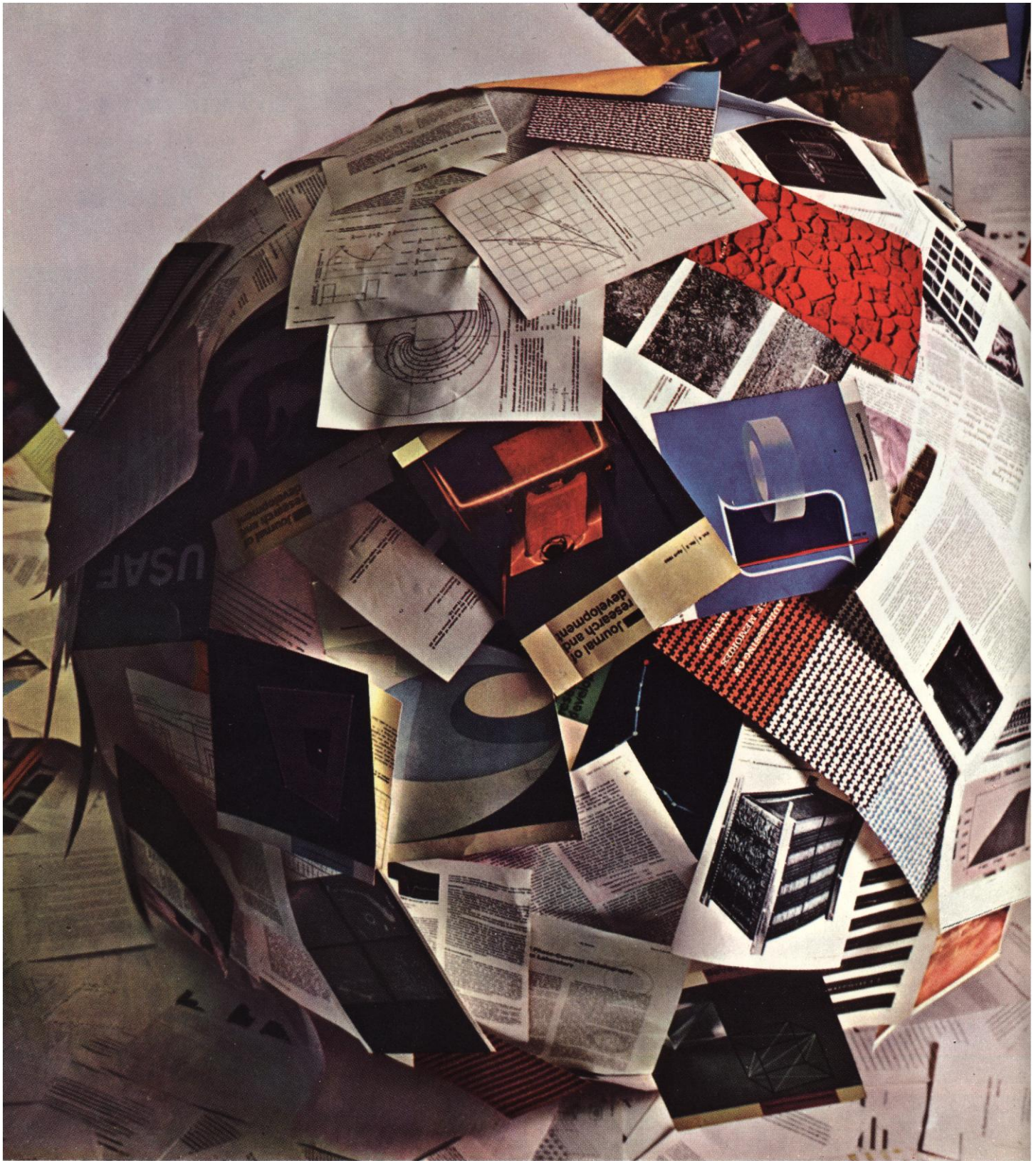
26 October 1962

Vol. 138, No. 3539

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



ATOMIC FIREBALL



Information is snowballing

IBM is finding new ways of using computers to cope with the great volume of information that is piling up in science and business today.

One recent IBM development is a computer system that acts as an electronic traffic director for information. From the flood of reports, articles and books received by an organization, the new system selects and routes information to people according to their specific interests and needs.

In another area, IBM has developed a prototype information system that can store millions of document pages, yet is able to find and deliver a copy of any page within seconds. IBM scientists are also investigating new techniques for abstracting and indexing technical articles automatically.

New information-handling systems like these from IBM are urgently needed if scientists and businessmen are to make the best use of man's vast and growing store of information.

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Puromycin

A most unique antibiotic.

After recent testing against a variety of experimental tumors in various animals, puromycin showed significant cytotoxicity in vitro against a series of tissue cultures derived from normal and neoplastic human and animal cells. Characteristically, puromycin completely inhibited protein synthesis in *Pseudomonas fluorescens*. But *not* nucleic acid synthesis. In experiments with *Escherichia coli*, puromycin prevented the final condensation of activated amino acids to peptides. It cured *Trypanosoma equiperdum* infections in mice and rabbits, and was partially effective against *T. cruzi*. In Tobie's tests on mice for puromycin's trypanocidal properties, puromycin had a strong suppressive effect against all species, except *T. congolense*.

Send for a free review of puromycin, and a detailed bibliography.

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Puromycin Aminonucleoside,

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Unlike puromycin, the aminonucleoside is not antibacterially active. But it is more active than the antibiotic against trypanosomes and mammary adenocarcinoma in mice. It is totally active against *Toxoplasma gonii* in tissue culture. Its daily subcutaneous administration in rats is reported to result in Nephrotic syndrome and pathology which closely resemble the nephrotic syndrome in children.

A summary of research work with Aminonucleoside, and a detailed bibliography, are available free. Write NBCo.

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Tetranitro BT (TNBT) offers many advantages for the histo and cytochemical localization of oxidative enzymes in tissue sections.

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2. Crystallization phenomena has never occurred in TNBT stained tissues.
3. The granular precipitate of TNBT formazan is of exceedingly fine dimension, for a more corrective staining picture.
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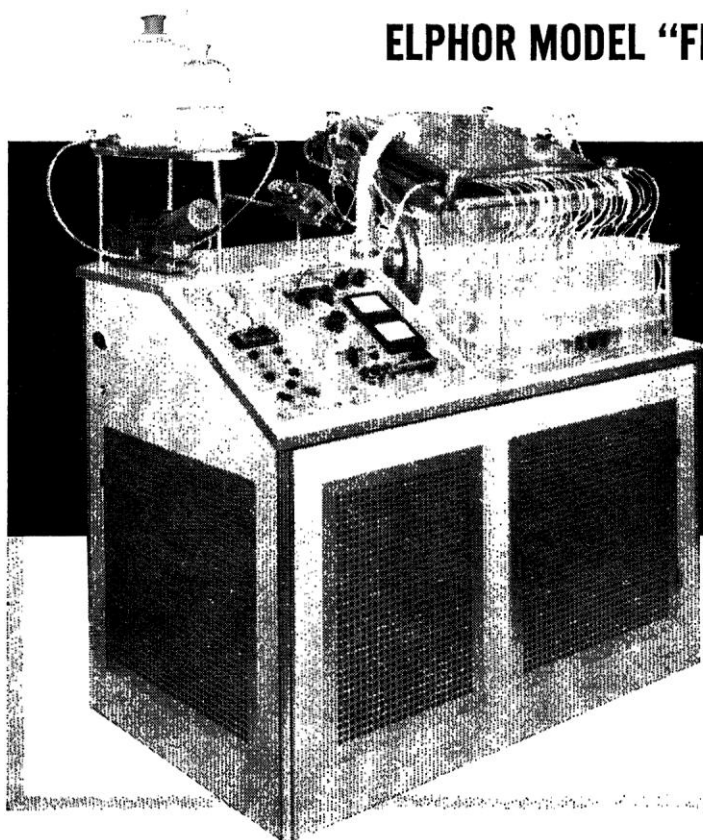
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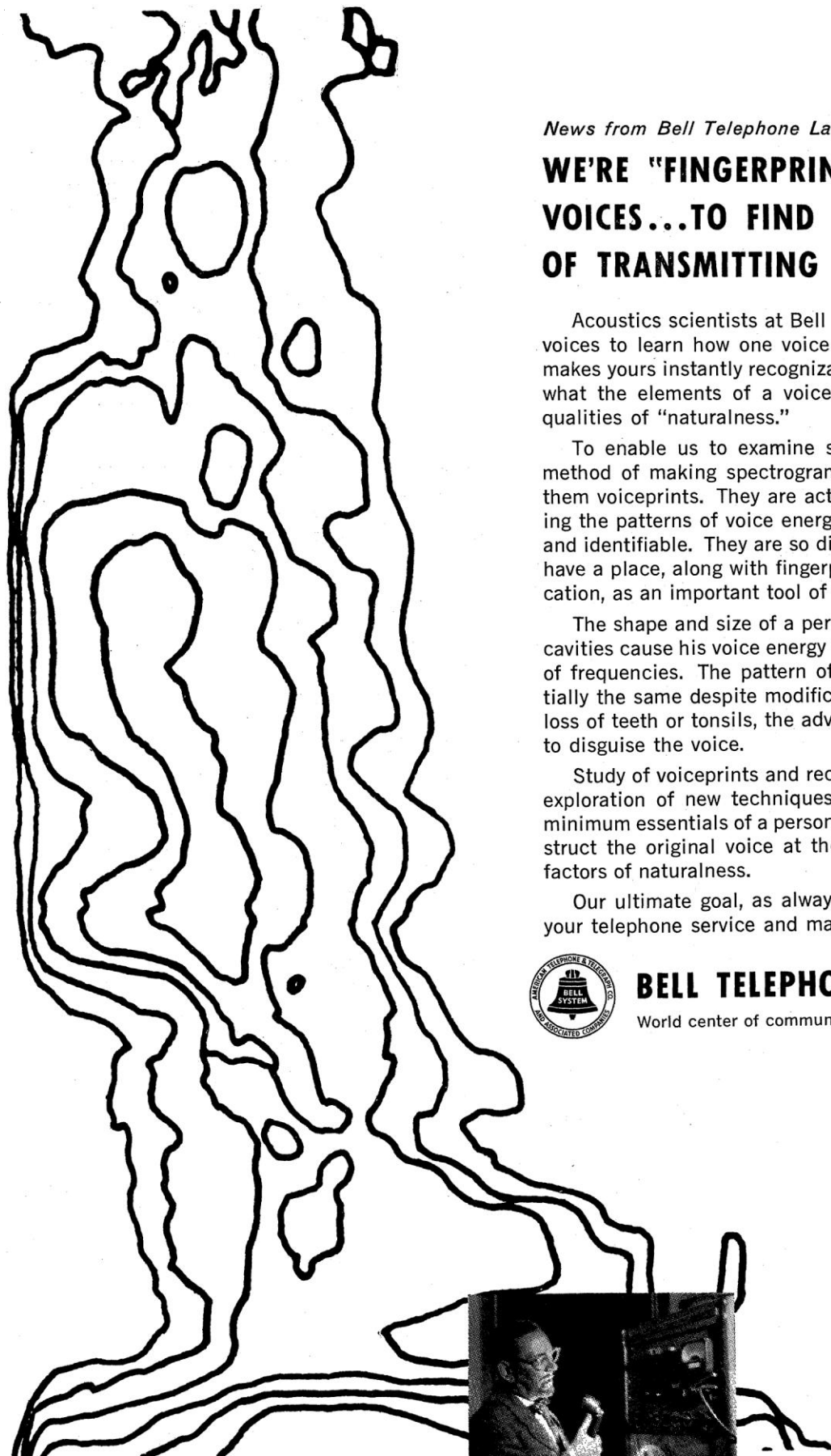
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Cover	Frames from a motion picture film showing an effect of the light from an atomic fireball at Eniwetok. Roosting birds, awakened by the light, took to the air. The feathers of black birds were ignited, and the birds fell to the ground (see trails in the two pictures at the bottom). White-feathered birds remained airborne. See page 483.	



News from Bell Telephone Laboratories

WE'RE "FINGERPRINTING" VOICES...TO FIND BETTER WAYS OF TRANSMITTING THEM

Acoustics scientists at Bell Telephone Laboratories study voices to learn how one voice differs from all others, what makes yours instantly recognizable to friends and family, and what the elements of a voice are that give it the elusive qualities of "naturalness."

To enable us to examine speech closely, we devised a method of making spectrograms of spoken words. We call them voiceprints. They are actual pictures of sound, revealing the patterns of voice energy. Each pattern is distinctive and identifiable. They are so distinctive that voiceprints may have a place, along with fingerprint and handwriting identification, as an important tool of law enforcement.

The shape and size of a person's mouth, throat and nasal cavities cause his voice energy to be concentrated into bands of frequencies. The pattern of these bands remains essentially the same despite modifications which may result from loss of teeth or tonsils, the advancement of age, or attempts to disguise the voice.

Study of voiceprints and recognition factors is part of our exploration of new techniques to extract and transmit the minimum essentials of a person's voice and from these reconstruct the original voice at the receiving end, retaining its factors of naturalness.

Our ultimate goal, as always, is to learn how to improve your telephone service and make it a better value.

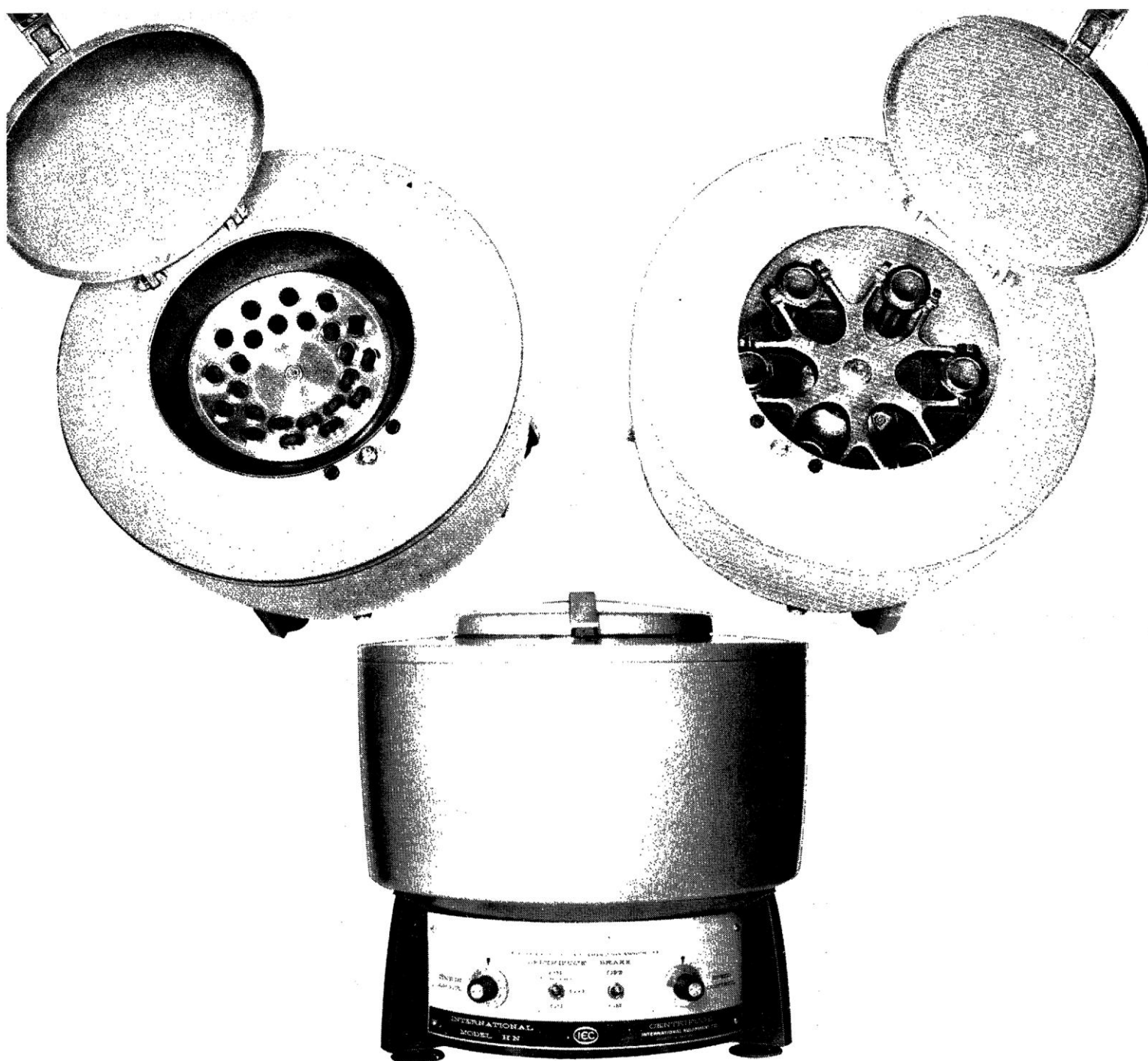


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World center of communications research and development

Word Picture. This is a picture of the spoken word "you." By analyzing the sound with a spectrograph, the Laboratories' Lawrence G. Kersta makes a print of the word in graph form. Graph shows frequency, time taken, and intensity used in making speech sound.





YOU REALLY OUGHT TO LOOK INTO THE NEW IEC HN ... A "COMPACT" WITH BIG CENTRIFUGE VERSATILITY

Examine this superb new instrument. You'll see that IEC has built extraordinary **versatility** into this modern, compact, quiet-running centrifuge.

Look at the angle head in the upper left picture, for example. It swings **twenty-four** 15 ml tubes at 3800 rpm — 2100 X G. Look at the horizontal head at the upper right. It swings **six** 50 ml tubes at 2670 rpm — 1120 X G. These are just samples. You can acquire over **fifty** heads and accessories which can be interchanged in hundreds of combinations to perform an exceptional variety of work.

You'll find the new model HN centrifuge convenient and efficient, too. It has an automatic timer; smooth, stepless speed controller; an electric brake and a heavy gauge steel guard bowl. In fact, you'll find the features and versatility of the HN put it well into the work range of larger, more expensive centrifuges. It fills a universal need for an intermediate centrifuge with capacities formerly available only in larger centrifuges. It is priced well within the most conservative budget. Would you like complete literature? Write for 12-page Bulletin HN.

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What's so different about the Vanguard Model 1000 volumatic fraction collector?

A Only the Vanguard Model 1000 Volumatic Fraction Collector is completely transistorized, completely self-contained. Thanks to transistorization, you're assured of absolute reliability in performance. This reliability even extends to cold-room environments where temperature often causes erratic operation or complete instrument failure.

Q. How does the Vanguard Volumatic Fraction Collector affect hold-up and mixing?

A. In volumetrically controlled separations, hold-up and mixing are virtually eliminated between fractions.

Q. How is this reduction possible?

A. The Model 1000 uses a unique system of repetitive cuts for a single sample, in conjunction with a photo-electric sensing device. It actually collects from one to ten times the siphon volume in each test tube. You simply dial the number of times you want the siphon filled and discharged into each test tube.

Q. Is the Model 1000 compact and portable?

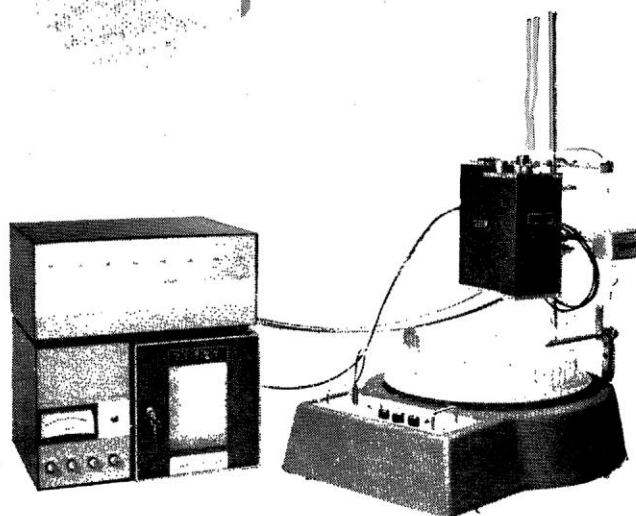
A. Vanguard's Model 1000 is highly compact. Specifically: 25" wide, 30" long and 6" high. So, you make maximum use of laboratory and cold-room space. The Volumatic weighs less than 50 lbs. Yet, because the instrument cabinet is cast aluminum, you get the strength and rigidity needed for large columns and ancillary equipment.

Q. Any other facts?

A. Interchangeable turntables for 13mm, 15mm and 18mm test tubes are standard accessories. There's a complete selection of siphons. For increased versatility, a time and drop counting plug-in unit is available.

Q. Where can I get more information?

A. For complete information about the Model 1000, write: Vanguard Instrument Company, Box 244, LaGrange, Illinois.



Shown above are Vanguard's all new Model 1056 Automatic UV Analyzer and Model 1000 Volumatic Fraction Collector.

VANGUARD

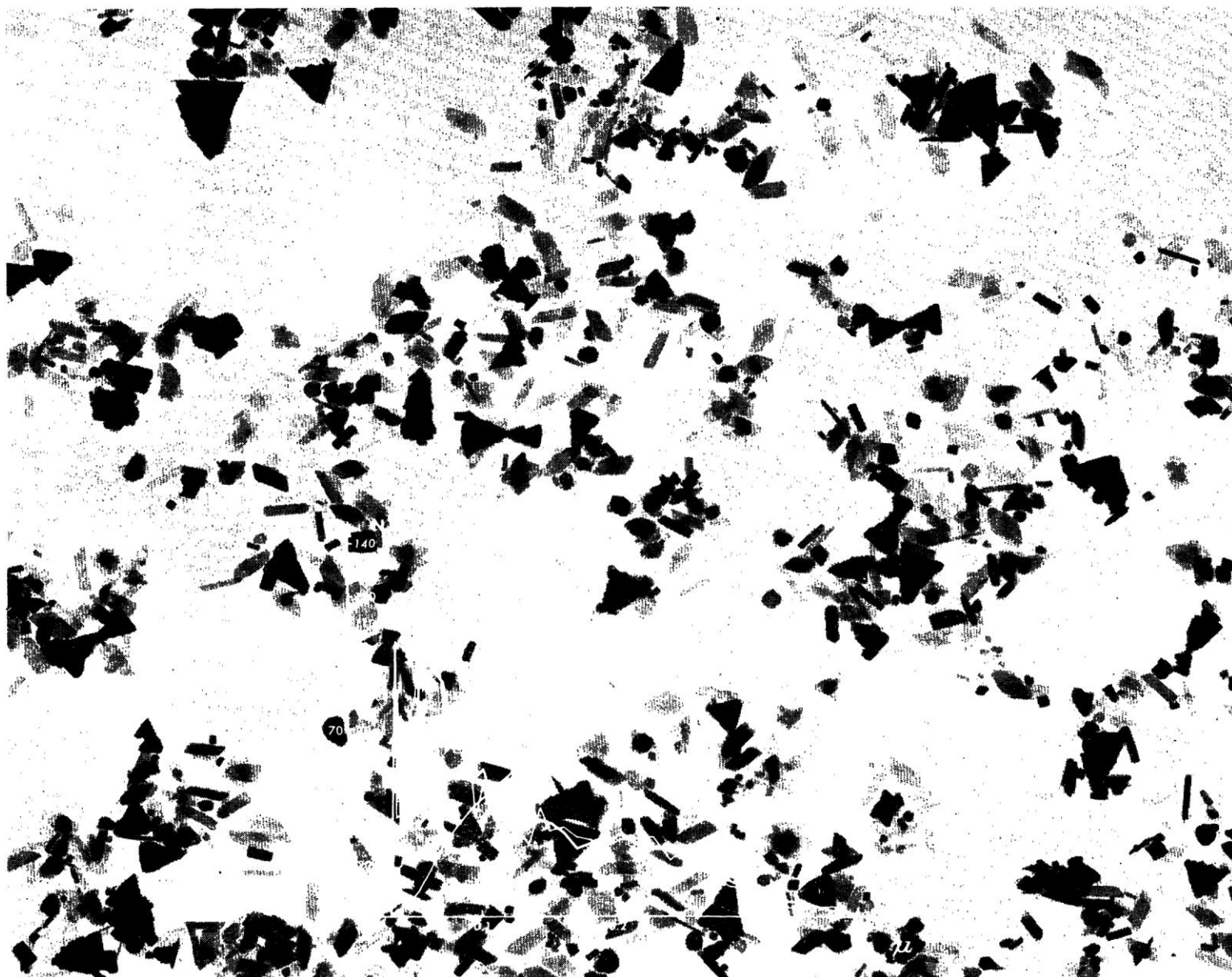


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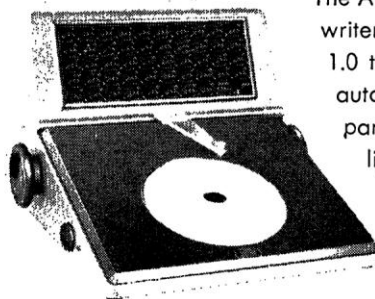
Electron micrograph and graphic analysis of $Al(OH)_3$ sol. 16,000x.

How to get an accurate picture of particle size distribution quickly

The Carl Zeiss Particle Size Analyzer TGZ3 is basically a combination projector and electrical counting device. It is easy to operate: Place the enlarged photomicrograph or electron micrograph on the stage of the instrument. Turn a knob until the round, bright spot of light has the same area as the selected particle. Then press a foot pedal. A signal pulses to one of the 48 counters, determined by the size of the image of the iris diaphragm forming the spot. At the same time a punch descends and puts a minute hole in the counted particle to prevent repetition of a count.

With this instrument you can count and classify approximately 1000 particles in less than 15 minutes. Fatigue is reduced and accuracy improved.

The circular shape of the bright spot makes it easy to estimate sizes, also length and width of rod-shaped particles. Step widths can be recorded as absolutely constant or exponentially increasing and as either a distribution or summation curve.



The Analyzer is about the size and weight of a typewriter. It offers two particle-image measuring ranges: 1.0 to 9.2mm and 1.2 to 27.7mm. Since it is semi-automatic you can also count agglomerations of particles. A knob allows you to adjust background light for comfortable contrast. Fields in which this instrument is successfully used are: rubber, pigments, films, abrasives, etc. Write to us for further details. **Complete service facilities available.**



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Retail Price: \$7.50. AAAS Member's Cash Price: \$6.50.

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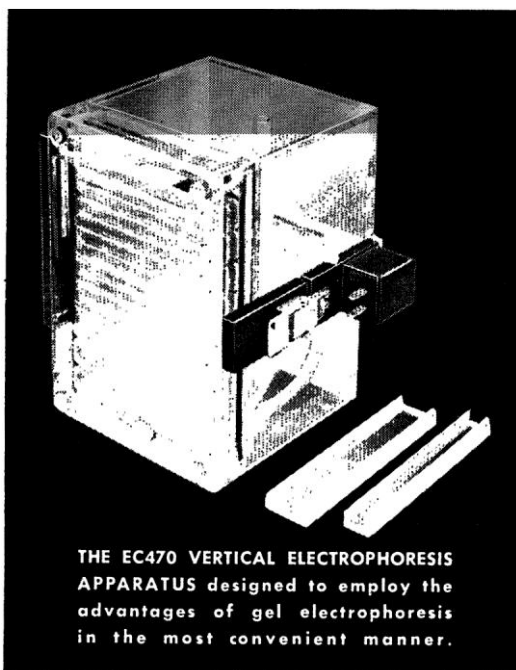
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The polarographic method is capable of reproducibility to 1/10% and analytical accuracy to 1/2%. To make use of this facility, the instrument must be accurate to 1/10% and chart space must be provided for recording large steps to achieve measuring precision. We strongly advise against the purchase of any polarographic instrument using miniature (5 inch) charts and low gain balancing systems in the 1% order of precision.

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Polarizing Ranges, volts: 0 to -1; -1 to -2; -2 to -3; -3 to -4; +.5 to -.5; 0 to -2; -2 to -4; +1 to -1; 0 to -3; +1.5 to -1.5.

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Current Accuracy: 1/10%

Voltage Accuracy: 1/4%

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Damping: RC, four stage.

Pen: ball point; Leroy type optional.

Suppression: zero displacement control, mercury cell powered, 6 times chart width, upscale or downscale.

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Net Weight: 65 pounds.

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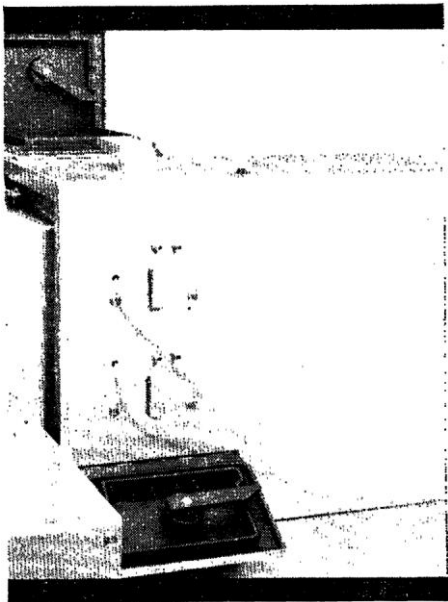
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“publicly” by antivivisectionists and others in our society who either have not known or have not cared about the scientific aspects of the problem. I regret that Ansevin is apparently unaware of the very grave problems that the scientific community is even today facing as a result of several congressional bills regarding animal experimentation. She certainly seems unaware of the concerted efforts of the various scientific societies in response to these bills. For some sense of this problem I refer her to the *A.I.B.S. Bulletin* of February 1961. In my opinion it would have been better not to “publicly” raise this complex problem in this manner at this time.

Regarding the experiment itself, if precedent may be taken as a defense, we find ourselves on solid ground. The bibliography on sleep deprivation experiments runs into the hundreds. Such experiments extend at least from 1891—from an early experiment by Manasseina on the exhaustion of young pups by sleep deprivation—to a recent Russian experiment in 1961, by Feldman, involving prolonged sleep deprivation in cats and dogs. The treadmill apparatus used in our experiment with rats was described in 1946 by Bunch and Licklider, in the *Journal of Comparative and Physiological Psychology*, and an “improved” version for mice was described by Kavanau in March 1962 in the *Journal of Applied Physiology*. Certainly these precedents should place our experiment at least within the general professional ethic.

As for the animals themselves, considerable care was taken in dealing with them. Evidence of this is the fact that only one animal died in the 28-day experiments, and that this death resulted from a pulmonary condition which could have occurred under circumstances independent of the experiment. The remaining animals were carefully watched, often at the cost of considerable discomfort and occasional “exhaustion” on the part of the experimenters. Finally, the animals were carefully tested for several months after their experience on the wheel, and no evidence of permanent damage was found by comparison with the control group. I do not, of course, have measures to indicate whether “pitiful states of exhaustion” occurred, or whether the animals were forced to counteract a “sensation of drowning.”

However, Ansevin’s letter poses two more general propositions that cannot

be so specifically dealt with. It is suggested (i) that we refrain from performing “extreme” experiments, and (ii) that when animals are used in experiments that involve “acute suffering” “clear and important justification” be provided. Clearly, the words *extreme*, *acute suffering*, and *clear and important justification* are highly judgmental and value-laden terms. *Extreme* may be defined as any condition exceeding that occurring to an “average” animal at an “average” time; *acute suffering*, as any condition in which it might be inferred that the subject would not freely volunteer for the condition; *clear and important justification*, as the prospect of completely modifying a theory or saving x number of lives in y time. Clearly, on the basis of such criteria or variations thereof, to provide controls would be impossible and the range of our experiments would be pedestrian; the use of subjects would be governed by whimsy or short-term emotional outbursts. Perhaps even more important, the requirement of “justification” would obliterate basic research. I hope that we may rather continue to be guided in our choice of conditions and use of subjects by the desire to seek systematic relationships in the world about us and integration of these relationships with the theories and accumulated knowledge of our various disciplines. Let us hope that the “ethic” that we are to be governed and judged by in our choice of such conditions or subjects will be that of our peers in the scientific community rather than one derived in the absence of an awareness of the overall issues involved.

Finally, I cannot forbear noting that the “inconsequential” findings which Agnew and I reported have been of such interest to at least a portion of our scientific community as to exhaust our supply of reprints within 6 weeks.

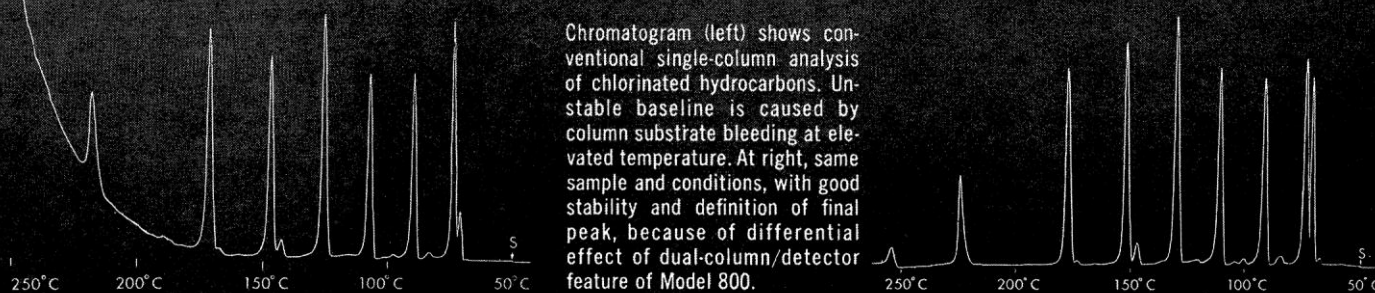
WILSE B. WEBB

Department of Psychology,
University of Florida, Gainesville

Wrong Subtitle

Since political scientists have not yet invented a new and more accurate language for their discipline, I think they have an obligation to be as precise and objective as they can in writing plain English. For this reason I trust you will let me note for the record that

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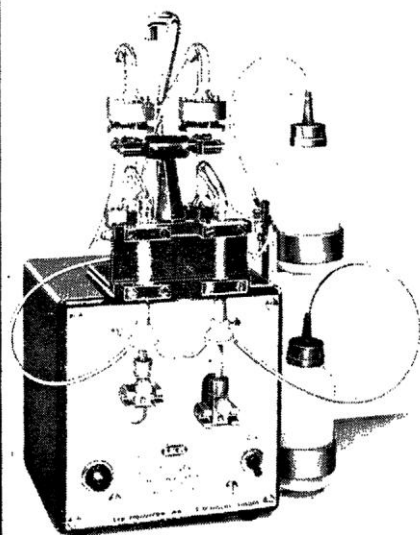
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the subtitle which *Science* added to my article entitled "The scientific establishment" [136, 1099 (1962)] was not written by me, and indeed was one which I had expressly objected to using.

That subtitle, as published, read thus: "The American system gives scientists in government a freedom and influence unmatched in other countries." The statement is vague enough to be defensible, but I do not really believe it is true, and my article made no such sweeping gesture to our national self-esteem. I would not argue with a British scientist that he is less free than his American colleague, and I am not sure that certain Russian scientists have less influence than their counterparts here.

The subtitle which I proposed (and which I am sure was left out by mistake) was this: "Scientists in policy roles help create a constitutional system unlike parliamentary or Marxist models." I was trying to say that scientists in the United States had had an important role in creating a different system, not that the system was better. I happen to like it, but it is a good idea, I think, to analyze objectively a system that we are talking about even if we then wish to judge it according to our prejudices. I have been pleased to note that some of the things in my article which American readers thought were meant to give high praise to the system have been taken by certain British friends as a shameful confession of the political delinquency of the United States.

DON K. PRICE

Graduate School of Public
Administration, Harvard University,
Cambridge Massachusetts

We plead guilty to the oversight of not substituting the subtitle suggested by Dr. Price after his article had gone to the printer. Our proofreaders should have caught the mistake in the galley proofs.—Ed.

Sand Dune Alignment

G. F. Jordan in his excellent paper on "Large submarine sand waves" [*Science* 136, 839 (1962)] has quoted me [*ibid.* 132, 1369 (1960)] as implying that linear sand dunes from the Arabian Peninsula are oriented parallel to the prevailing winds.

Without detracting from the excellence of his paper, I wish to state, for

the record, that as far as the Arabian Desert is concerned, under no circumstances can linear dunes be aligned parallel to the prevailing winds. The situation is much more complex than this. Linear dunes are generally formed parallel to a line that may be the resultant of forces exerted by winds from a minimum of three directions, only one of which, usually a mild or moderate wind, is apt to be parallel to the axes of the dunes.

In the Rub' al Khali, linear dunes originate as fields of transverse crescentic dunes, which, in the course of a long time, evolve into elongated, linear groups, which may in turn become partly or entirely linear in shape. Relief is built up by seasonal storm winds from opposite to adjacent quarters and the lineation is accentuated by moderate winds parallel to the axis, usually from one direction.

The curved linear sand waves shown in Jordan's Fig. 7, bear some similarity to desert dune patterns but appear to be oriented 180° out of phase. For desert dunes, the arcs are always *upwind* and the concavities are *downwind*.

The analogy of sand dunes to waves is unfortunate. Dunes, contrary to commonly held notions, are immobile, thus can hardly be considered as wave forms. Sand migrates; dunes do not. The distinction is made obscurely by R. A. Bagnold in his book, *The Physics of Blown Sand and Desert Dunes*.

DONALD A. HOLM

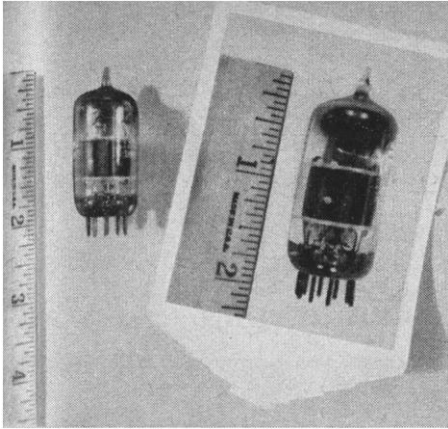
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My statement about extensive linear dunes and their alignment parallel to "prevailing winds" should have been attributed to Kadar, whom I cited, and to others, including Bagnold, cited by him, who described Libyan dunes, not to Holm, who described the Arabian dunes. The latter dunes appear to be parallel to "reversing winds," as indicated in Holm's paper by his description of the wind regime in Rub' al Khali and by lineations in his Fig. 1.

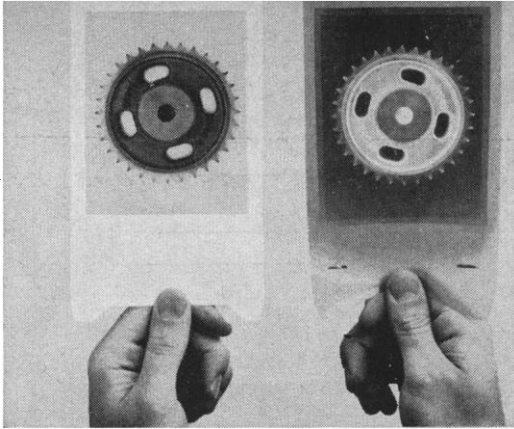
As for the curvature of crestlines on Cultivator Shoal in my Fig. 7 in relation to cross-sectional asymmetry (Profile 2), it does appear that conditions are contrary to those in the encircled area to the west (Profile 7) and in dune patterns described by Holm and others. Further field investigations of the environment here are certainly needed.

G. F. JORDAN

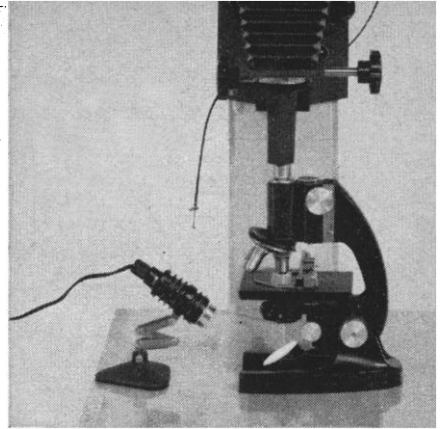
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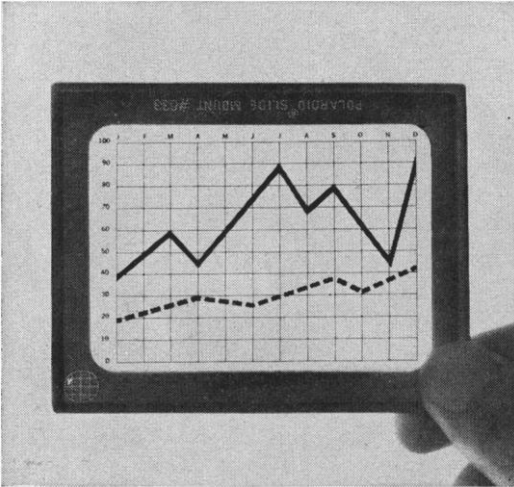
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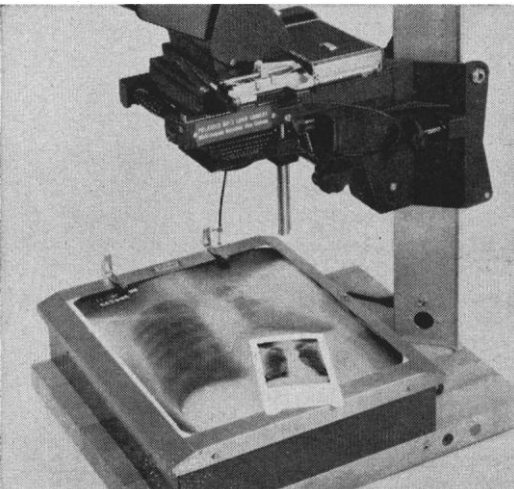
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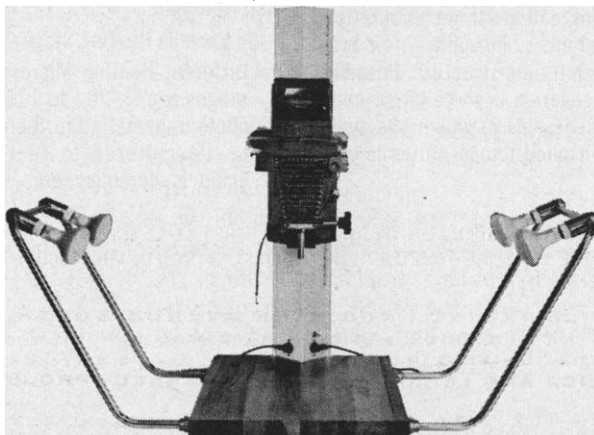
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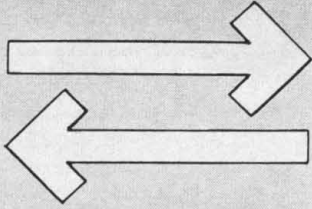
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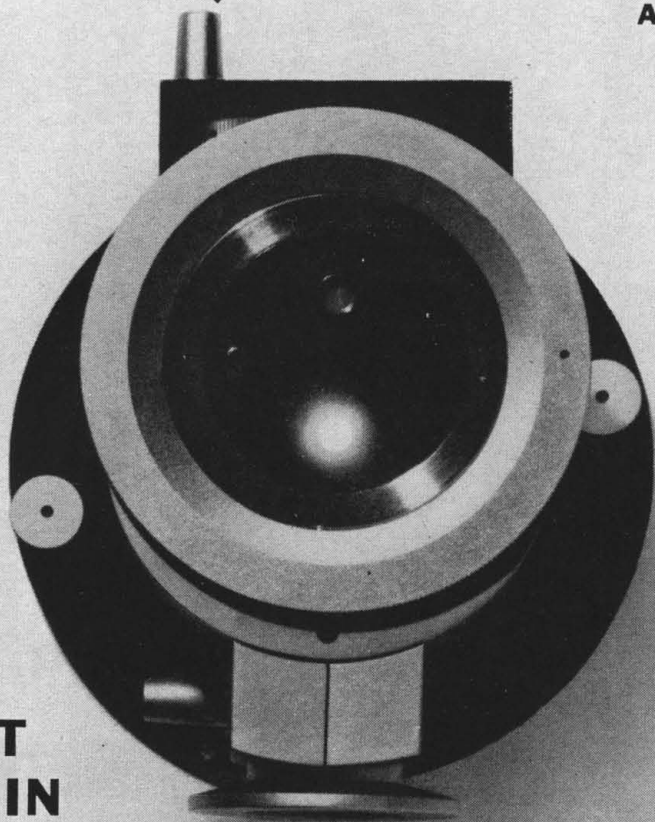


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Contributors Can Contribute Too

This week, on page 496, we publish a paper of our own that is neither an editorial, news, nor Association affairs. It is called "Instructions for contributors." It describes the kinds of papers we believe readers expect to find in *Science*, the level of language that is appropriate, and the form in which manuscripts should be prepared. We urge prospective contributors to follow these instructions, for if they do, the selection process can be speeded up and the period between receipt and publication of papers can be shortened. Failure to follow the instructions will inevitably result in delays.

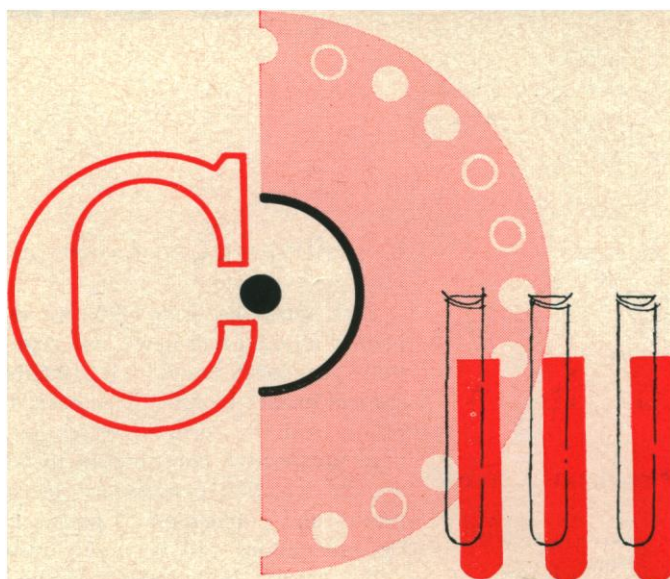
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Abstract. Provide an abstract of 45 to 55 words on page 2. The abstract should amplify the title but should not repeat it or phrases in it. Qualifying words for terms used in the title may be used. Tell the results of the work, but not in terms such as "———" "was found" or "is described" or "is presented."

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further work. If your paper is a short report of work covered in a longer paper to be published in a specialty journal, you may refer to this paper if it has been accepted. Name the journal. If the manuscript has not been accepted, refer to it as "in preparation." Omit references to private communications. Do not use subheads.

Signature. List the authors on the last page of the text and give a simple mailing address.

Received dates. Each report will be dated the day an acceptable version is received in the editorial office.

Letters

The Letters section provides a forum. Letters are usually comments on articles and reports (*not* letters) already published, but they may also be expressions of opinion about some question of interest to scientists. No illustrations are used. Technical comments or letters containing data will be considered for publication as reports.

Letters will be judged only on clarity of expression and interest to the scientific public. Keep them short, preferably to less than 250 words. The editors may shorten letters. Proofs are not furnished to authors; reprints are not available.

Meeting Reports

Meeting reports should summarize a few of the most important scientific results and give an interpretation of them in terms that can be understood by a wider audience than that represented by those who attended the symposium. Focus your report on events that will have interest, news value, and significance to an audience of varied background. A definitive report is not possible, and a catalog of who spoke on what subject is dull. Most meeting reports are solicited.

Book Reviews

Book reviews for *Science* are solicited. Describe, appraise, and evaluate the book. Write for a general scientific audience. Consider the book's scope, purpose, contents, and potential usefulness, and state your opinion of the book clearly and concisely.

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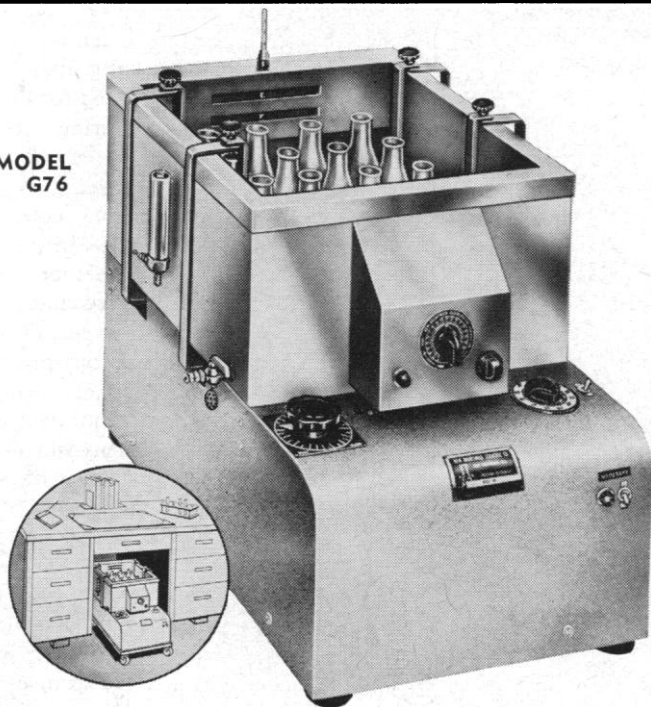
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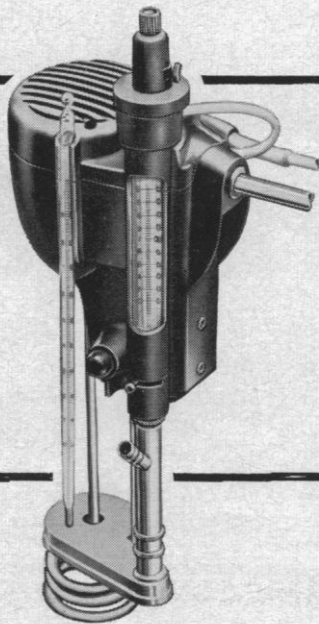
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myosin having been used synonymously for the protein that makes up the major part of the thick filaments of molluscan muscle. J. Hanson presented electron micrographs (obtained with J. Lowy) that demonstrated the presence of only two kinds of filaments in "catch" muscles.

The fact that the paramyosin-containing filaments have free tapered ends, and are therefore discontinuous, was adduced as evidence that paramyosin (tropomyosin A) is not responsible for the "catch" or maintenance of tension. Lowy and Hanson propose that the "catch" in these specialized muscles is due to the slow release of the links formed between actin and myosin in contraction. An alternative point of view was put forward by C. Ruegg, who described experiments in which the actomyosin system was inactivated by various reagents, including thiourea, without concomitant impairment of the "catch" mechanism. W. Johnson and A. G. Szent-Györgyi presented corroborative data indicating a pH-dependent phase transition in the paramyosin system of glycerol-extracted fibers. These results supported the view that paramyosin (tropomyosin A) is the component responsible for the "catch" and is distinct from the actomyosin system responsible for the development of tension.

The session on the interaction between myosin and actin, with H. H. Weber as chairman, was dominated by discussion of the relaxing factor in muscle. Although it was generally agreed that the sarcoplasmic reticulum participates in the mechanism of relaxation, the precise mode in which this structural component exerts its effect was not established. In view of the ATP-dependent binding of calcium by the sarcoplasmic reticulum (Ebashi and Hasselbach) and the well-known inhibition of relaxation by calcium, some investigators considered that calcium binding alone may explain the phenomenon of relaxation. Others expressed the view that the elaboration of a soluble relaxing substance by the reticulum could play an important role with or without further calcium binding.

The problems relating to the energetics of muscle were introduced by the session chairman, D. R. Wilkie. R. E. Davies and D. F. Cain reported the disappearance, during the single contraction, of adenosine triphosphate in

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frog muscles treated with 1,2,4-fluorodinitrobenzene. This significant observation, if confirmed in other laboratories, should settle the doubts that have persisted for several years about the role of adenosinetriphosphate as the immediate source of energy for contraction.

The last session of the conference dealt with theories of muscle contraction and with some problems related to excitation coupling. The chairman, R. J. Podolsky, ably outlined theories based essentially on the double-filament model. Two alternative schemes were examined: one involved simple sliding of filaments without changes in the structure during contraction; the other was based on the possibility of shortening in the thin filaments. A. G. Szent-Györgyi and W. Johnson proposed a new theory derived from the fluorescent antibody results, in which connections were postulated between the myosin and the actin filaments in opposing halves of the sarcomere. According to their hypothesis, some reorganization or folding within the myosin filaments during contraction. In the discussion that followed it was noted that no evidence for structural changes in the thick filaments during contraction has as yet been demonstrated.

The participants felt that this had been a useful and stimulating conference, enabling workers in various fields to focus on critical and unresolved problems in the structure and function of muscle.

C. COHEN

*Children's Cancer Research Foundation,
Children's Hospital Medical Center,
and Harvard Medical School,
Boston, Massachusetts*

J. GERGELY

*Retina Foundation, Massachusetts
General Hospital, and Harvard
Medical School, Boston*

A. MARTONOSI

Retina Foundation

Acarology

For the first time in the Western Hemisphere, acarologists from the diverse disciplines of taxonomy, physiology, biochemistry, genetics, disease transmission, behavior, and economic control met together to share their research and to focus upon their mutual concern—acarology. Observers have noted that this historic meeting pushed



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the discipline of acarology ahead several years and provided the stimulus needed for planning an annual symposium on acarology. Among the 168 participants were acarologists from Germany, France, the Congo, South Africa, Canada, New Zealand, and the Canal Zone. Notable among these acarologists from other countries was Marc André, editor of *Acarologia*.

Financial support for the meeting was provided by several chemical companies, and considerable interest was evidenced in the 23 papers dealing with bionomics and control of acarine pests. These discussions centered about such diverse subjects as acaricidal activity and chemical structure and the control and bionomics of acarine pests of cotton, florists crops, citrus, woody ornamentals, and poultry and other livestock. Attention also centered upon the predatory activity of certain mite species with respect to housefly eggs and eggs of other mite species. New techniques for mounting, rearing, and testing chemical and biological responses in acarine forms were reported.

Of special interest was the strong program in the areas of physiology, biochemistry, and nutrition of acarine forms. Attention was focused upon carbohydrate metabolism; esterases and the biochemistry of nerve function in the two-spotted spider mite; water balance and equilibrium humidity; population dynamics; genetics of resistance and cross resistance of acarine forms; and nutrition.

Transmission of disease by the Acarina was also considered as the relationship between mites and ticks and their role in disease transmission in plants and animals were reviewed. Recent discoveries on the intricate role mites play in the transmission of plant diseases were discussed in detail.

Current problems in acarine systematics were carefully examined, particular attention being paid to the increasingly important role of numerical taxonomy and the current complexity of spider-mite taxonomy, genetics, and morphology. A thorough discussion of the systematics of endoparasitic acarines and some novel approaches to the measurements of microacarines were included. The behavior of mites and ticks in response to light, humidity, and hosts and their sex behavior also received attention.

The symposium was characterized by a spirit of fraternity which led to the formation of a Committee on Acarology

comprised of all those in attendance, with the following elected officers: Dean Furman, chairman; Tyler Wooley, program chairman for 1963; Donald Chant, secretary; and John Naegele, treasurer. Under the leadership of these officers the committee members will decide whether to become an autonomous society or a subgroup of some larger society.

Plans for the publication of the papers presented at the symposium are being made. It is anticipated that they will be published in a bound volume, the first of a series of yearly symposium volumes to be entitled "Recent Advances in Acarology."

JOHN A. NAEGELE
*New York State College of Agriculture,
 Cornell University, Ithaca*

Treatment of Irradiated Primates

From 15 to 18 August 1962 an international symposium on bone marrow therapy and chemical protection in irradiated primates was held in Rijswijk, the Netherlands. The main objective of the symposium was to exchange ideas as to the causes of difficulties in the treatment of irradiated primates, including human patients, and to discuss future research plans for overcoming these difficulties.

There were sessions on bone marrow transplantation in monkeys, on the immunological activity of the primate fetus, on human applications of bone marrow transplantation, on chemical protection of primates, and on monkey-colony management.

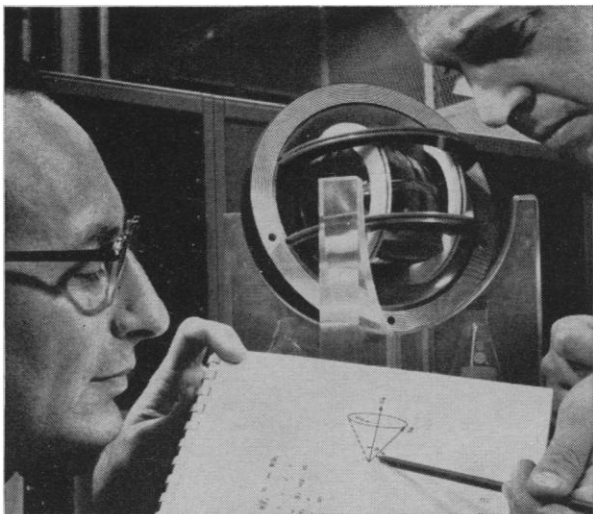
The symposium was sponsored by the Organization for Health Research, T.N.O. The Radiobiological Institute, T.N.O., acted as host for the meetings. There were 32 participants, from France, the Netherlands, the United Kingdom, and the United States; 22 of the participants presented papers.

The proceedings of the conference, including transcripts of the discussions, are expected to be available by 1 November from the Radiobiological Institute, T.N.O., 151 Lange Kleiweg, Rijswijk (Z.H.), Netherlands, or from Dr. R. R. Overman, University of Tennessee College of Medicine, Memphis (\$4).

D. W. VAN BEKKUM
*Radiobiological Institute,
 National Health Research Council,
 Rijswijk, Netherlands*

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18-21. **Information System Sciences**, Congr., Hot Springs, Va. (E. M. Bennett, MITRE Corp., P.O. Box 208, Bedford, Mass.)

19-21. **European Packaging Federation**, Congr., Paris, France. (EPF, 3 rue La Boétie, Paris 8^e)

19-23. **Radioactive Dating**, intern. symp., Greece. (Intern. Atomic Energy Agency, 11 Kärntner Ring, Vienna 1)

19-26. **Paris Intern. Dental Sessions**, Paris, France. (G. Delbart, 3 place de la Gare, Mantes, S.-et-O., France)

20. **Manufacturing Chemists' Assoc.**, mid-year conf., New York, N.Y. (MCA, 1825 Connecticut Ave., NW, Washington 9)

20-24. **Fish Diseases**, intern. symp., Turin, Italy. (R. Vittoz, Intern. Office of Epizootics, 12 rue de Prony, Paris 17^e, France)

22-23. **International Waste Rubber and Plastics Federation**, conf., Antwerp, Belgium. (R. G. Kirkpatrick, Moorgate Hall, Moorgate, London, E.C.2, England)

22-24. **Central Assoc. of Science and Mathematics Teachers**, St. Louis, Mo. (J. Kennedy, Indiana State College, Terre Haute)

22-24. **National Council for Geographic Education**, Chicago, Ill. (L. Kenamer, Univ. of Texas, Austin)

22-27. **Automation and Instrumenta-**

tion, Congr., Milan, Italy. (Federazione delle Associazioni Scientifiche e Tecniche di Milano, Via del Politecnico 10, Milan)

22-27. **Thermotechnology**, intern. conf., Milan, Italy. (A. Barbieri, Via Marcona 15, Milan)

22-3. **Latin American Forestry Commission**, Santiago, Chile. (U.N. Food and Agriculture Organization, Regional Office, Casilla 10095, Santiago)

23-24. **American Mathematical Soc.**, Chicago, Ill. (AMS, 190 Hope St., Providence 6, R.I.)

23-24. **American Physical Soc.**, Cleveland, Ohio. (K. K. Darrow, APS, Columbia Univ., New York 27)

23-24. **American Soc. of Animal Science**, Chicago, Ill. (C. E. Terrill, Animal Husbandry Research Div., Agricultural Research Center, Beltsville, Md.)

24-25. **American College of Chest Physicians**, Los Angeles, Calif. (ACCP, 112 E. Chestnut St., Chicago 11, Ill.)

26-28. **Atomic Industrial Forum**, annual clinical meeting, Los Angeles, Calif. (Circulation and Records Dept., AMA, 535 N. Dearborn St., Chicago 10, Ill.)

25-30. **American Soc. of Mechanical Engineers**, New York, N.Y. (ASME, 345 E. 47 St., New York 17)

25-30. **Radiological Soc. of North America**, annual, Chicago, Ill. (M. D. Frazer, 1744 S. 58 St., Lincoln, Neb.)

26. **Industrial Pharmacy Section**, American Pharmaceutical Assoc., annual regional, Chicago, Ill. (M. Higgins, G. D. Searle Co., Chicago 80)

26-27. **Combustion Inst.**, western states section, Sacramento, Calif. (G. Fenech, Combustion Inst., 16902 Bollinger Dr., Pacific Palisades, Calif.)

26-29. **American Nuclear Soc.**, Washington, D.C. (O. Bizzell, Isotope Technology, Development Branch, Div. of Isotopes Development, U.S. Atomic Energy Commission, Washington 25)

27-28. **Medical Conf.**, North Atlantic Treaty Organization, Paris, France. (NATO, Information Service, Port Dauphine, Paris 16^e)

27-29. **AtomFair**, American Nuclear Soc.-Atomic Industrial Forum, Washington, D.C. (R. Barlow, Atomic Industrial Forum, 850 Third Ave., New York 22)

27-30. **Biological Future of Man**, symp., London, England (by invitation only). (Ciba Foundation, 41 Portland Pl., London, W.1)

28-29. **Materials Information Retrieval**, symp., Dayton, Ohio. (E. Dugger, ASRCM-1, Aeronautical Systems Div., Wright-Patterson AFB, Ohio)

28-30. **Human Factors Soc.**, annual, New York, N.Y. (G. E. Rowland, Rowland and Co., Box 61, Haddonfield, N.J.)

28-30. **National Foundation Birth Defects Centers**, conf., Miami, Fla. (Science Information Div., National Foundation, 800 Second Ave., New York 17)

28-30. **Reinforced Plastics**, intern. conf., London, England. (British Plastics Federation, 47-48 Piccadilly, London, W.1)

28-30. **Technical Progress in Communication Wires and Cables**, annual symp., Asbury Park, N.J. (H. F. X. Kingsley, U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J.)

28-30. **Ultrasonics Engineering**, symp., New York, N.Y. (R. N. Thurston, Bell Telephone Laboratories, Murray Hill, N.J.)

28-30. **Vocational Rehabilitation**, seminar, Manila, Philippines. (D. J. Tablan, Philippine Foundation for the Rehabilitation of Disabled, Philippine Natl. Red Cross Bldg., corner of Gen. Luna and Victoria, Intramuros, Manila)

29-1. **Homogeneous and Heterogeneous Catalysis**, symp., Rostock, Germany. (Institut für Organische Katalyseforschung, Deutsche Akademie der Wissenschaften zu Berlin, Buchbinderstr. 5-6, Rostock)

29-1. **Legal Medicine and Forensic Science**, 1st interamerican conf., Rio Piedras, Puerto Rico. (L. A. Bear, First Interamerican Conf., P.O. Box 12065, University Station, Univ. of Puerto Rico, Rio Piedras)

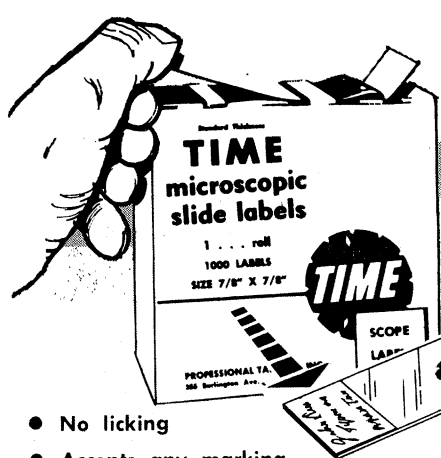
29-1. **Physical Factors Modifying Response to Radiation**, conf., New York, N.Y. (E. P. Cronkite, Medical Research Center, Brookhaven Natl. Laboratory, Upton, L.I., N.Y.)

29-1. **National Acad. of Sciences**, autumn meeting, Austin, Tex. (Meetings Dept., NAS, 2101 Constitution Ave., Washington 25)

29-1. **Texas Acad. of Science**, Austin. (D. E. Edmondson, Mathematics Dept., Univ. of Texas, Austin 12)

30-1. **Connective Tissue**: Intercellular Macromolecules, symp., New York, N.Y. (S. J. Farber, c/o New York Heart Assoc., 10 Columbus Circle, New York 19)

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