Instructions for Contributors

The Editors of *Science*

Manuscripts submitted to *Science* for consideration for publication can be handled expeditiously if they are prepared in the form described in these instructions.

Submit an original and two duplicates of each manuscript. With the manuscript send a letter of transmittal giving (i) the name(s) of the author(s); (ii) the title of the paper and a one- or two-sentence statement of its main point; (iii) the name, address, and field of interest of four to six persons in North America but outside your institution who you think are qualified to act as referees for your paper; (iv) the names of colleagues who have reviewed your paper for you; (v) the field(s) of interest of readers who you anticipate will wish to read your paper.

Editorial Policies

All papers submitted are considered for publication. The author's membership or lack of membership in the AAAS is not a factor in selection. Papers are accepted with the understanding that they have not been published, submitted, or accepted for publication elsewhere. Authors will usually be notified of acceptance, rejection, or need for revision in 4 to 6 weeks (Reports) or 6 to 10 weeks (Articles).

Types of papers. Five types of signed papers are published: Articles, Reports, Letters, Technical Comments, and Book Reviews. Familiarize yourself with the general form of the type of paper you wish to submit by looking over a recent issue of the journal, and then follow the instructions for that type of paper.

Reviews. Almost all Articles, Reports, and Technical Comments, whether solicited or not, are sent to two or more outside referees for evaluation of their significance and soundness. Forms showing some of the criteria reviewers are expected to consider are available on request.

Editing. Papers are edited to improve the effectiveness of communication between the author and his readers. The most important goal is to eliminate ambiguities. In addition, improvement of sentence structure often permits readers to absorb salient ideas quickly. When editing is extensive, with consequent danger of altered meanings, papers are returned to the author for correction and approval before type is set. Authors are free to make additional changes at this stage.

Proofs. One set of galley proofs or an equivalent is provided for each paper. Keep alterations to a minimum, and mark them only on the galley, not on the manuscript. Extensive alterations may delay publication by 2 to 4 weeks.

Reprints. An order blank for reprints accompanies proofs.

Writing Papers

Organize your material carefully, putting the news of your finding or a statement of the problem first, supporting details and arguments second. Make sure that the significance of your work will be apparent to readers outside your field, even if you feel you are explaining too much to your colleagues. Present each step in terms of the purpose it serves in supporting your finding or solving the problem. Avoid chronological steps, for the purpose of the steps may not be clear to the reader until he finishes reading the paper.

Provide enough details of method and equipment so that another worker can repeat your work, but omit minute and comprehensive details which are generally known or which can be covered by citation of another paper. Use metric units of measure. If measurements were made in English units, give metric equivalents.

Avoid specialized laboratory jargon and abbreviations, but use technical terms as necessary, defining those likely to be known only in your field. Readers will skip a paper they do not understand. They should not be expected to consult a technical dictionary.

Choose the active voice more often than you choose the passive, for the passive voice usually requires more words and often obscures the agent of action. Use first person, not third; do not use first person plural when singular is appropriate. Use a good general style manual, not a specialty style manual. The University of Chicago style manual, the style manual of the American Institute of Physics, and the *Style Manual for Biological Journals*, among others, are appropriate.

Manuscripts

Prepare your manuscript in the form used by *Science*. Use bond paper for the first copy. Submit two duplicates. Double-space title, abstracts, text, signature, address, references (including the lines of a single reference), figure legends, and tables (including titles, columns, headings, body, and footnotes). Do not use single spacing anywhere. Put the name of the first author and the page number in the upper right-hand corner of every page.

Paging. Use a separate page for the title; number it page 1. Begin each major section—text, references and notes, and figure legends—on a new sheet. Put each table on a separate sheet. Place figure legends and tables after the references.

Title. Begin the title with a word useful in indexing and information retrieval (not "Effect" or "New").

References and Notes. Number all references to the literature, footnotes, and acknowledgments in a single sequence in the order in which they are cited in the text. Gather all acknowledgments into a single citation, and keep them short ("I thank," not "I wish to thank"). Cite all references and notes but do not cite them in titles or abstracts. Cite several under one number when feasible. Use *Access —Key to the Source Literature of the Chemical Sciences* with the few suggested revisions in *International List of Periodical Title Word Abbreviations* for abbreviations of journal names. If the journal is not listed there, provide the full name. Use the following forms:

Journal: H. Smith, *Am. J. Physiol.* **98**, 279 (1931).

Book: F. Dachille and R. Roy, *Modern Very High Pressure Techniques* (Butterworth, London, 1961), pp. 163–180.

Chapter: F. Dachille and R. Roy, in *Reactivity of Solids*, J. H. De Boer, Ed. (Elsevier, Amsterdam, 1960), p. 502.

Illustrations. Submit three copies of each diagram, graph, map, or photograph. Cite all illustrations in the text and provide a brief legend, to be set in type, for each. Do not combine line

drawings and photographs in one illustration. Do not incorporate the legend in the figure itself. Use India ink and heavy white paper or blue-lined coordinate paper for line drawings and graphs. Use heavier lines for curves than you use for axes. Place labels parallel to the axes, using capital and lower-case letters; put units of measurement in parentheses after the label—for example, Time (sec). Plan your figures for the smallest possible printed size consistent with clarity.

Photographs should have a glossy finish, with sharp contrast between black and white areas. Indicate magnification with a scale line on the photograph.

Tables. Type each table on a separate sheet, number it with an arabic numeral, give it a title, and cite it in the text. Double space throughout. Give each column a heading. Indicate units of measure in parentheses in the heading for each column. Do not change the unit of measure within a column. Do not use vertical rules. Do not use horizontal rules other than those in the heading and at the bottom. A column containing data readily calculated from data given in other columns can usually be omitted; if such a column provides essential data, the columns containing the other data can usually be omitted.

Plan your table for small size. A one-column table may be up to 42 characters wide. Count characters by counting the widest entry in each table column (whether in the body or the heading) and allow three characters for spaces between table columns. A two-column table may be 90 characters wide.

Equations and formulas. Use quadruple spacing around all equations and formulas that are to be set off from the text. Most should be set off. Start them at the left margin. Use the solidus for simple fractions, adding the necessary parentheses. But if braces and brackets are required, use built-up fractions. Identify handwritten symbols in the margin, and give the meaning of all symbols and variables in the text immediately after the equation.

Articles

Articles, both solicited and unsolicited, may range in length from 2000 to 5000 words (up to 20 manuscript pages). Write them clearly in reasonably nontechnical language. Provide a title of one or two lines of up to 26 characters per line and a subtitle consisting of a complete sentence in two lines with a character count between 95 and 105 for the sentence (spaces between words count as one character each). Do not break words at the ends of lines. Write a brief author note, giving your position and address. Do not include acknowledgments. Place title, subtitle, and author note on page 1. Begin the text on page 2.

Insert subheads at appropriate places in the text to mark your main ideas. The set of subheads should show that your ideas are presented in a logical order. Keep subheads short—up to 35 characters and spaces.

Provide a summary at the end.

Do not submit more than one illustration (table or figure) for each 4 manuscript pages unless you have planned carefully for grouping. With such planning many illustrations can be accommodated in the article. Consult the editorial office for help in planning.

Reports

Short reports of current research results may vary in length from one to six double-spaced manuscript pages of text. The shorter papers receive preferred treatment. Limit illustrative material (both tables and figures) to one item for each three manuscript pages. Three items is the maximum. A research report should have news value for the scientific community or be of unusual interest to the specialist or of broad interest because of its interdisciplinary nature. It should contain solid research results or reliable theoretical calculations. Speculations should be limited and is permissible only when accompanied by solid work.

Title. Begin the title with an important word (preferably a noun) that is likely to be useful to indexers. The title may be a conventional one (composed primarily of nouns and adjectives), a sentence (containing a verb) or a structure with a colon (Nictitating Membrane: Classical Conditioning and Extinction in the Albino Rabbit). Limit it to three lines of complete words of no more than 32 characters per line (spaces between words count as one character each). Do not use abbreviations. Type the title in the middle of page 1.

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," "is described," or "is presented."

Text. Begin the text on page 3. Put the news first. Do not refer to unpublished work or discuss your plans for 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 for discussion of matters of general interest to scientists. Letters are judged only on clarity of expression and interest. Keep them short and to the point; the preferred length is 250 words. The editors frequently shorten letters.

Technical Comments

Letters concerning technical papers in *Science* are published as Technical Comments at the end of the Reports section. They may add information or point out deficiencies. Reviews are obtained before acceptance.

Book Reviews

The selection of books to be reviewed is made by the editors with the help of advisers in the various specialties; arrangements are then made with reviewers. A sheet of instructions accompanies each book when it is sent to the reviewer.

Cover Photographs

Particularly good photographs suitable for use on the cover are desired.

SCIENCE

2 April 1971

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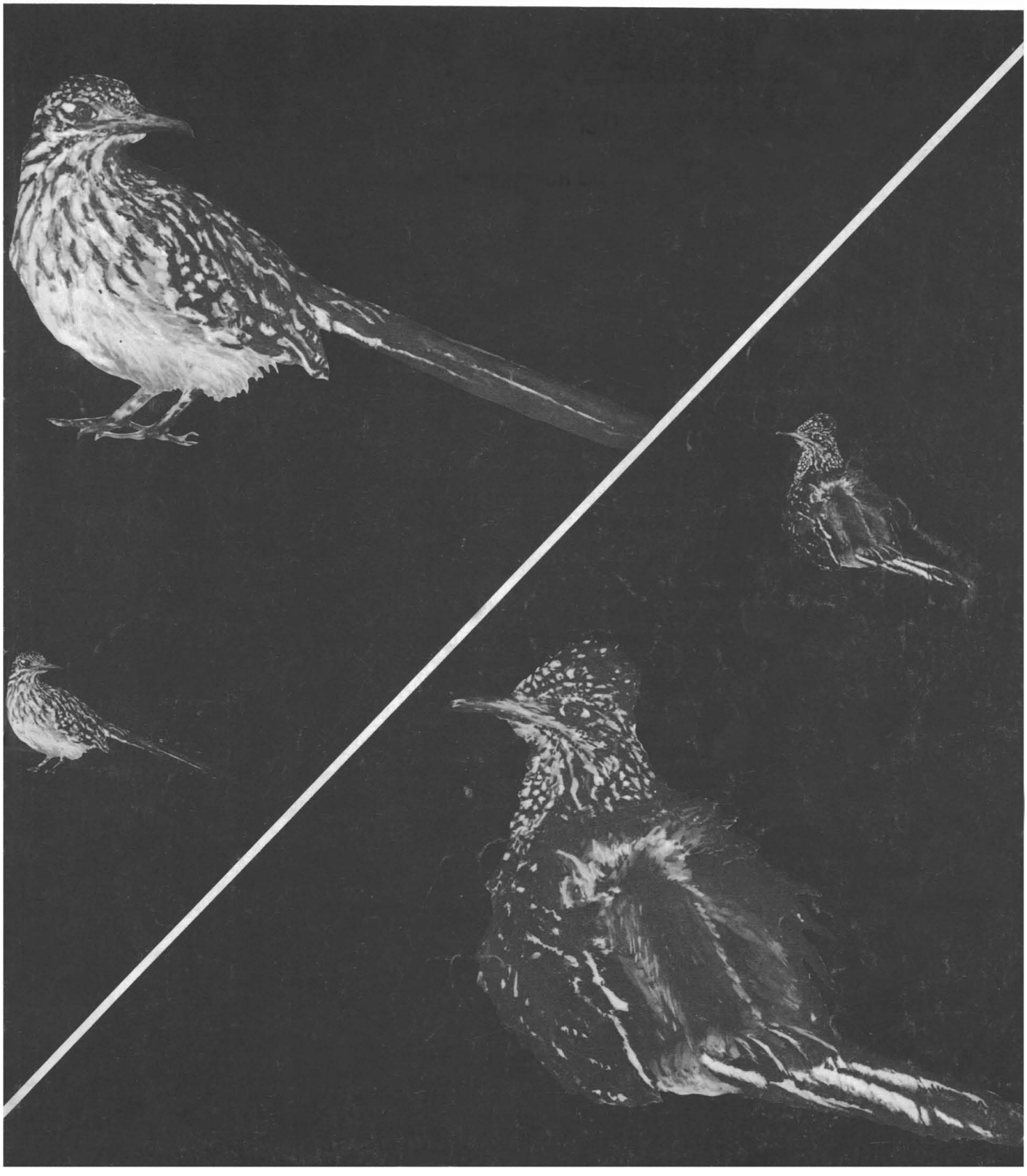
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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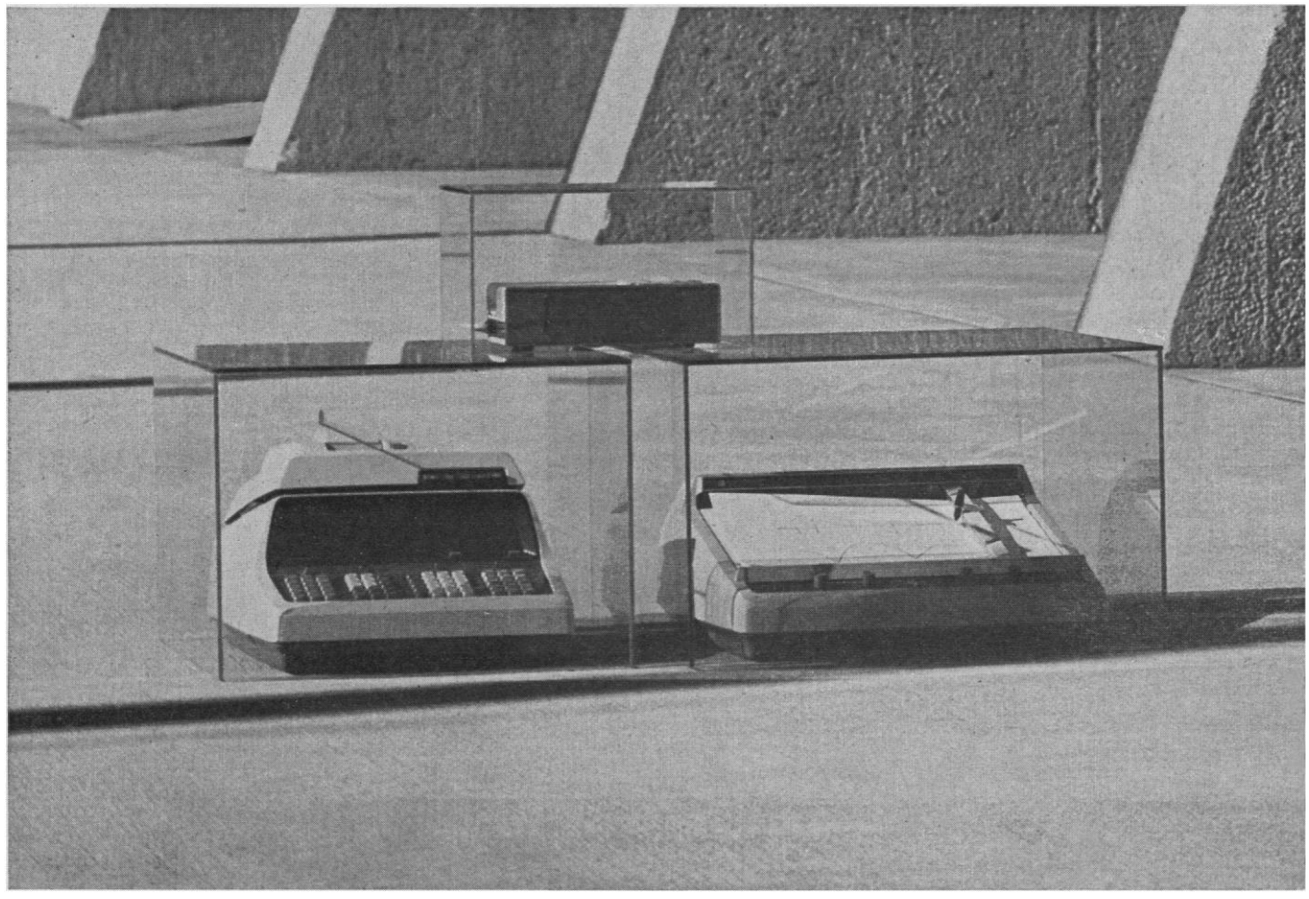
COVER

General appearance of the desert dwelling roadrunner (*Geococcyx californianus*) in the normal posture (above) and during sunning behavior (below). See page 67. [Marion Hamilton]

Bridge the Computing Gap



The HP Calculator System 9100. For People Who Demand More Than Just A Calculator

Chances are, you, like most other engineers, scientists, and businessmen, have found that a calculator alone isn't enough. Many times the tasks of entering data and putting solutions into useable form can eat up more time than the computation itself. That's why the HP Calculator System 9100 gives you more ways to enter your data, more memory to perform the calculations, and more ways to receive your solution than any other calculator on the market. This true system approach allows you to fit the right machine to your needs yet retain the low cost and ease of operation of a calculator.

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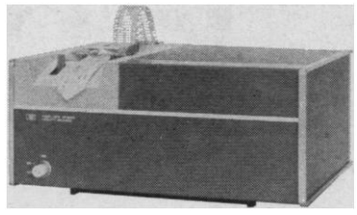

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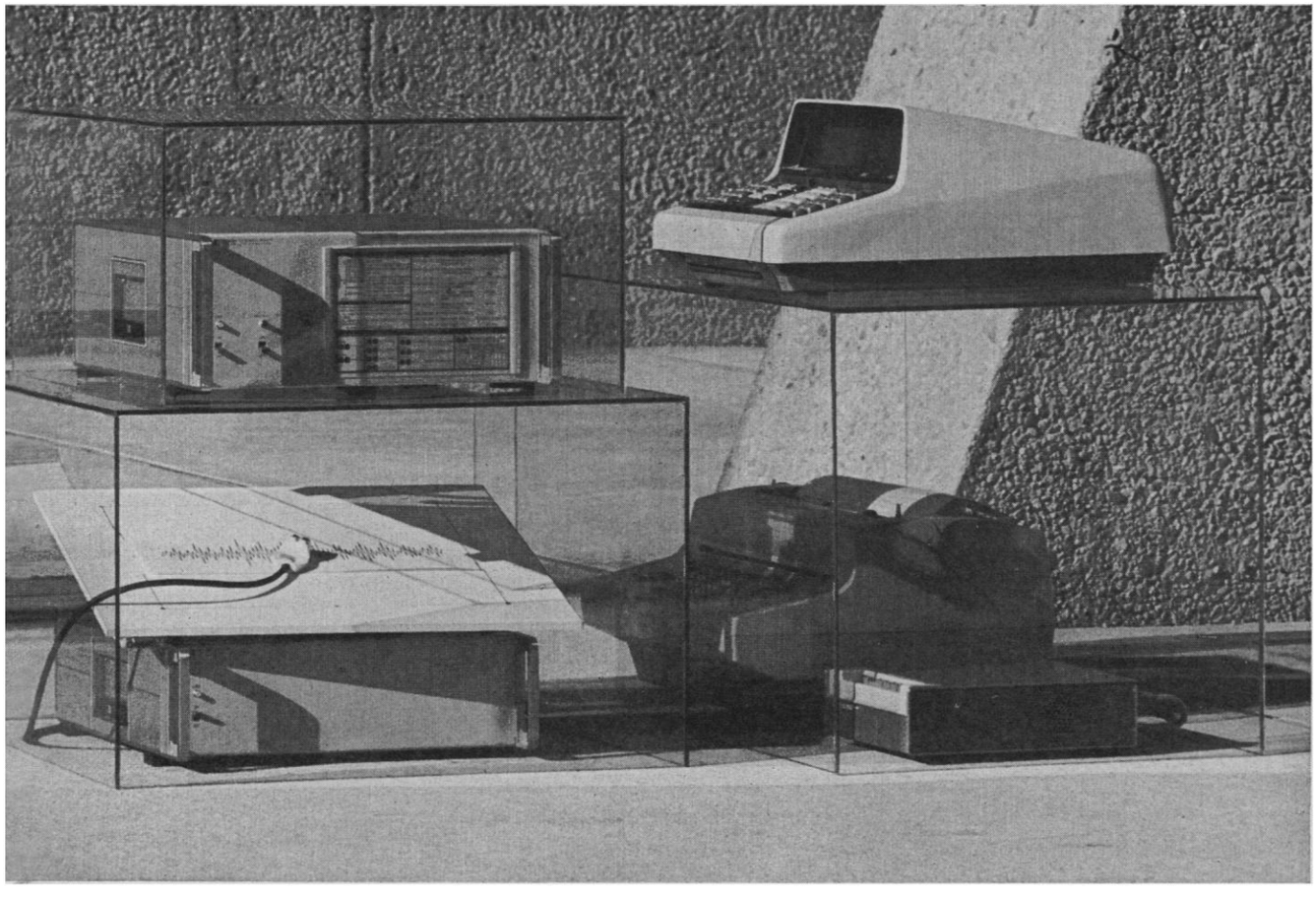

matrix inversion, or find real and complex roots of thirtieth degree polynomials. The Extended Memory is the biggest in the business. Its 248 storage registers will store up to 100 programs (3472 program steps), yet programming is quick and easy since you use indirect addressing.

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Or, you can couple the **new 9107A Digitizer** to your 9100 Calculator and have a fast, automatic means for checking mechanical drawings, profiles, maps—or analyzing strip chart data. The Digitizer automatically converts lines or points on charts or drawings to digital data for instant analysis by your 9100 Calculator. Just enter the appropriate program in the Calculator, move the Digitizer's cursor over the data line, and the Calculator computes and prints out the solution you desire. Your imagination is the only limit to the application of this versatile data input device.

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You can put the System 9100 to work for you for as little as $1.11 per computing hour. Purchase, lease, and rental options are available for all System 9100 equipment. For further information, or to arrange a "hands-on" demonstration at your desk, write: Hewlett-Packard, P.O. Box 301, Loveland, Colorado 80537. In Europe: 1217 Meyrin-Geneva, Switzerland.

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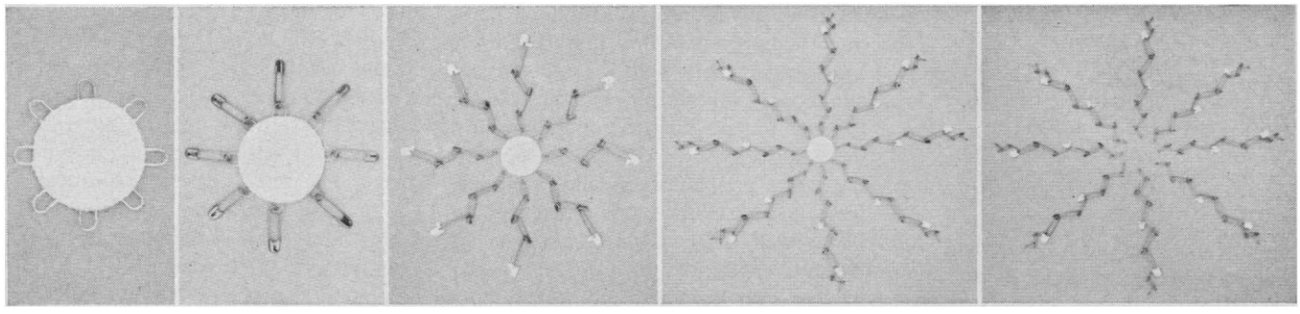
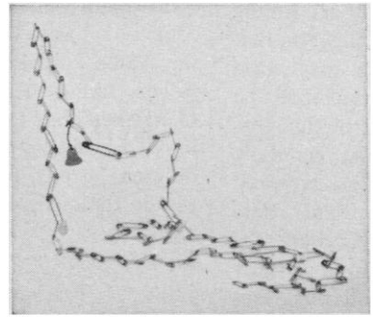


Beads and reporters

Assorted safety pins poorly represent amino acid residues. And the real number of chains per bead is not 8 but more like 10^{12}. We crave Merrifield's indulgence for this impertinence. Not too many years since he conceived his lovely but unnatural scheme for assembling peptides on chloromethylated polystyrene beads, many a laboratory can do it. At least we wish to believe that many will want to.

By comparison with Merrifield's Beads[1], the market may stand at an earlier stage of development for Koshland's Reagent[2]. This and certain more recently disclosed compounds[3] attach "reporter groups" near the active sites of enzymes. When the enzyme engages a substrate molecule, the reporter, jostled like a little bell, signals spectrophotometrically. This stimulates the deductive powers of the astute molecular biologist. The resulting glimpse of macromolecular conformation certainly contains more significant information than crude analogies can convey:



The beads and the reporters are just two of the categories of protein chemist's tools offered in an expanded edition of Kodak Publication JJ-8 issued in recent weeks and available on request from Dept. 412-L, Eastman Kodak Company, Rochester, N. Y. 14650.

[1] Chloromethylated Polystyrene: 2% Divinylbenzene Copolymer Beads (EASTMAN 11264)

[2] α-Bromo-4-nitro-o-cresol (EASTMAN 9601)

[3] 2-Bromoacetamido-4-nitrophenol (EASTMAN 11317) and 2-Chloromercuri-4-nitrophenol (EASTMAN 11288)

It is better to humanize than to dehumanize

"In ten years, textbooks as the principal medium of teaching will be as obsolete as the horse and carriage."
—Thomas A. Edison, widely accepted by Americans as the inventor of motion pictures

Yes, indeed. But the grandchildren of the schoolkids Edison was thinking of still carry textbooks and duck the occasional spitball when the teacher shows movies.

* * *

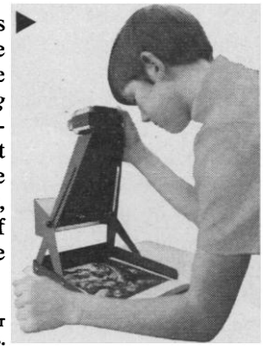
"In the 1970's, our century-old education system is disastrously failing us; and it puts those who run it and those who fund it in a position of promising what cannot be delivered. In our attempts to make the system more "efficient," enormously proficient technological means are being applied to an anachronistic end: we continue to inundate our schools with hardware and software aimed at mass instruction of children. But such technological products have only served to intensify the destructive dehumanization that already characterizes the American school system. Small wonder, then, that the new hardware and software have failed to help us solve the problems of educating our children; at best, they have made an outdated system more efficient. But in so doing, they have helped to postpone the critically needed shift to a sensitive responsiveness to the real needs of individual learners."
—from Recommendations by Forum on Educational Technology, 1970 White House Conference on Children

The committee which drafted that statement had one member from manufacturing industry. He happened to be a Kodak man. Kodak happens to be a manufacturer of educational hardware. Not exactly gee-whiz type hardware. Not yet. Maybe later. Maybe there has been too much gee-whiz too soon.

By application of only a moderate, economical quantity of gee-whiz, we make a super 8 movie projector stop to a cue marked on the film edge, freezing on screen a question to the one-child audience, or a statement. To thaw the freeze the kid must take action: forward or backward; one frame at a time, 6 frames/sec, a normal 18, or 54 for skipping to the point at issue. Quite a different relationship between viewer and film from what prevails in TV or theater. (Educational technology, the White House conferees agreed, must involve the individual learner in choosing the way to meet his needs.) Call it the KODAK EKTAGRAPHIC MFS-8 Projector.*

If repelled by even that much gee-whiz, consider the KODAK EKTAGRAPHIC Visualmaker.*

Child of the television era learns ▶ by finding material to create a slide show. The knowledge that each slide costs money, *which he is being trusted to spend,* is part of the benefit. Some kids, fortunately, don't need to make slides to concentrate on a topic. Vast numbers, however, are not that fortunate. Besides, if everybody had the gift of gab the noise would be intolerable.



*Look for the trademark "Kodak" under Audiovisual Equipment in the Yellow Pages.

Brief Background

Schwarz/Mann has a major commitment to peptide synthesis. Witness: we introduced the first commercially available Automated Peptide Synthesizer, we supply virtually every starting material needed for peptide synthesis, and we offer a custom peptide synthesis service. But that's only part of the story.

The Other Part of the Story

Our peptide chemists. We are most proud of this unusually competent and innovative group. Without doubt, it's one of the finest assemblages of experts in peptide synthesis. For example, this group has synthesized:

Secretin, (*Asp*^{1}, *Ile*^{5}) Angiotensin I and II, Bradykinin, Lysyl Bradykinin, Methionyl Lysyl Bradykinin, Angiotensin II Hexapeptide, Angiotensin II Heptapeptide, ACTH Decapeptide, Tetradeca Renin Substrate, Gly-Arg-Met-Lys-Bradykinin, Bradykinin Potentiating Factor, Fibrinopeptide A, Arginine Vasopressin, Arginine Vasotocin, Oxytocin.

Plus: (*Leu*^{10}-^{14}C (UL)) (*Asp*^{1}, *Ile*^{5}) Angiotensin I, (*Ile*^{5}-^{14}C (UL)) (*Asp*^{1}, *Ile*^{5}) Angiotensin II, (*Pro*^{2}-^{14}C (UL)) Bradykinin, (Pro^{3}-^{14}C (UL)) Lysyl Bradykinin, (Pro^{4}-^{14}C (UL)) Methionyl Lysyl Bradykinin.

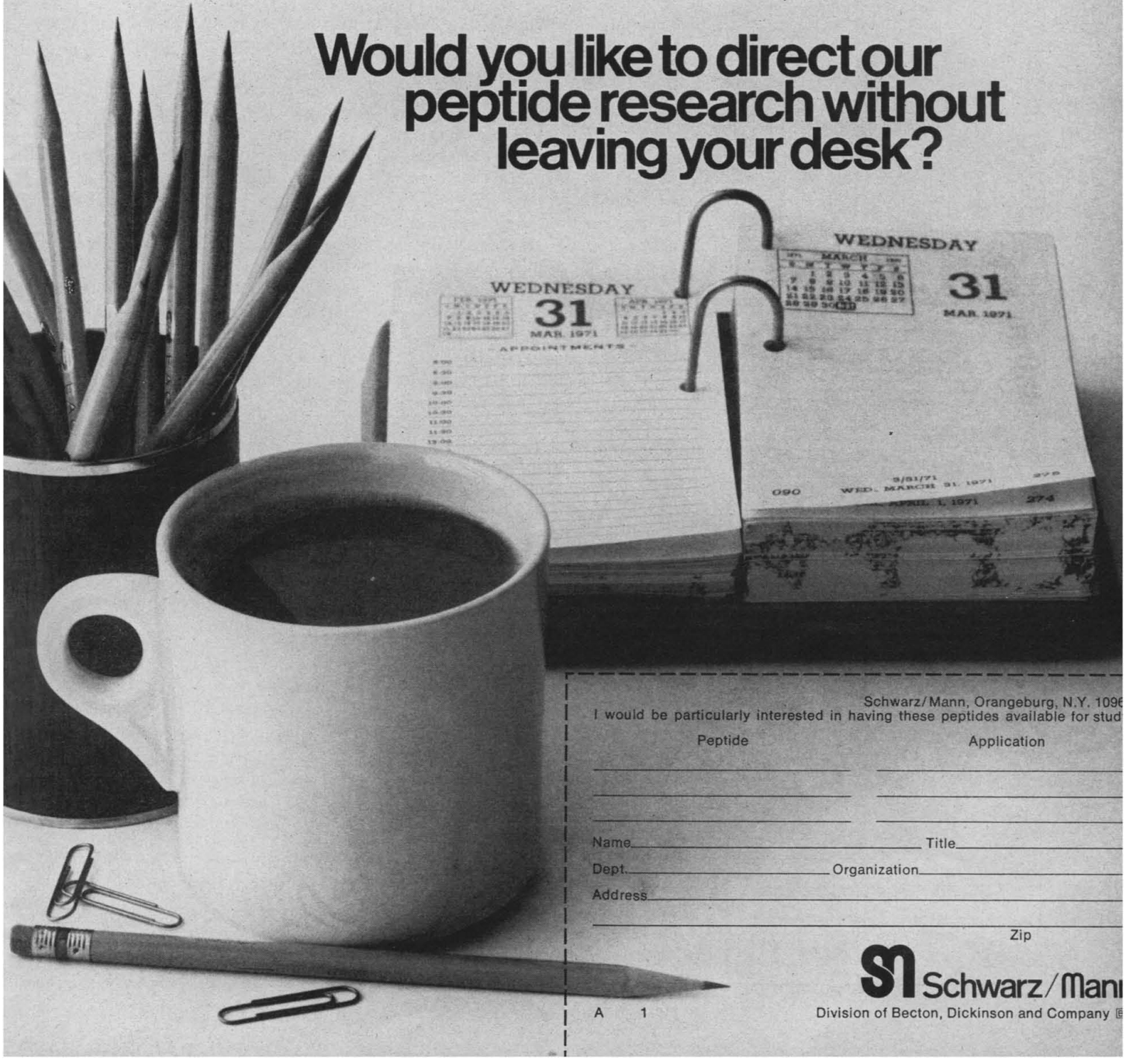
All of which now leads to this next offer...

You can direct our peptide research without leaving your desk.

Clearly, if anyone is in a position to synthesize the peptides you want to work with, we are. What would you like to have? Which peptides would you like to study now? Or in the future? If *our* peptide chemists were *your* peptide chemists, what would you ask them to do for you?

Note well: we'd be sad if the reader viewed this present effort as a covert way of soliciting orders for our custom synthesis service. Though we certainly welcome these, that's hardly the point of this piece. Rather, we wish to know—as you should wish us to know—what interests you so that our synthetic work can be keyed to your needs. (We want to be relevant, too.) Finally, there is absolutely no subsequent obligation of any kind on your part to purchase any of the peptides that you enumerate below. Write Schwarz/Mann, Orangeburg, N.Y. 10962, or use coupon below. Thanks.

Would you like to direct our peptide research without leaving your desk?



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I would be particularly interested in having these peptides available for stud

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A 1

married Mother and Her Child (McGraw-Hill, New York, 1954).

5. Interracial male children obtain a Y chromosome from their white or Negro father and an X chromosome from their white or Negro mother. With appropriate controls, this consequence allows an estimate of racial variation attributable to differences of sex chromosome inheritance. In the Willerman *et al.* study, sex chromosome differences are completely confounded with child-rearing differences.
6. J. C. DeFries, *J. Hered.* **55**, 289 (1964); J. C. DeFries, J. P. Hegmann, M. W. Weir, *Science* **154**, 1577 (1966).
7. Either differential sex chromosome inheritance or differential buffering or both might clarify the unexpected sex ratio in the Willerman *et al.* sample (76 males to 100 females) provided this ratio is, in fact, representative of interracial matings.

* Present address: Division of Psychological Studies, Educational Testing Service, Princeton, New Jersey 08540.

With respect to Walberg's comments, we believe that our multivariate analysis of these data is correct and illuminating. Furthermore, our original table 2 allows one to control for sex of child and marital status while testing maternal race effect. In male children t has a probability less than 0.001 for married mothers and just less than 0.05 for unmarried mothers. The t's for female children are not significant, but race-of-mother effect appears definitely to be absent only for female children of married mothers.

By pooling educational attainment over all age groups Henderson conceals what was made explicit in his original source, namely, that education is confounded with age. For example, Negro males aged 25 to 44 living in the Northeast have a median education of 12.1 years, those aged 45 to 64 average 9.4 years, and those 65 and over average 7.1 years. Parallel age trends are found for every geographical region for both races and sexes in that source.

Table 1 gives median education from the same survey (*1*), but includes only those between the ages of 25 and 44 (representing the bulk of our cases). These data are contrary to Henderson's assertions. In our sample it is the white mothers who have the lowest education. His point about a 12-year education ceiling effect is likewise not substantiated.

Goldhamer's comparison of our intermarriage data to his (*2*) which were collected almost 30 years earlier is not entirely appropriate. Nevertheless, Goldhamer's data do not support his claim since they show that 77 percent of intermarrying Negro brides as against 61 percent of Negro brides in general were employed in unskilled jobs while 64 percent of intermarrying white brides as against only 16 percent of white brides overall were similarly employed. Thus it appears from his data, as well as ours (Table 1), that the intermarrying Negro bride is less disadvantaged with respect to her non-intermarrying counterpart than is the intermarrying white bride. His findings do not indicate that the average intelligence for white female–Negro male matings is superior to the reverse mating type.

Table 1. Median years of school completed by race, sex, and regions for individuals aged 25 to 44 obtained from census data and from Willerman *et al.*

Region	Males	Females
White		
National excluding South	12.6	12.7
Metropolitan areas	12.7	12.5
Willerman *et al.*	12.0	11.0
Negro		
National excluding South	12.1	12.1
Metropolitan areas	12.0	12.0
Willerman *et al.*	12.0	12.0

That there may be motivational differences distinguishing intermarrying Negro from white males, as Van den Daele suggests, seems reasonable. The crucial question is whether these differences are heritably reflected in IQ and not counterbalanced by similar differences among intermarrying females.

If our data had a genetic explanation, it would have to be sex-linkage. But we regard it as unreasonable to think that loci affecting a quantitative character are all on one of the 23 haploid chromosomes. We are also erroneously cited as "embracing" sex-linkage to explain the observed sex-difference. X chromosome loss, as in Turner's syndrome, is not to be identified with sex-linkage.

If by "buffering in utero" Van den Daele refers to a less hospitable uterine environment for children of Negro mothers, this is not reflected in birth weight, length at birth, or gestational age in our data.

LEE WILLERMAN
Department of Human Genetics, University of Michigan Ann Arbor 48104

ALFRED F. NAYLOR
NTINOS C. MYRIANTHOPOULOS
Perinatal Research Branch, National Institute of Neurological Diseases and Stroke, Bethesda, Maryland 20014

References

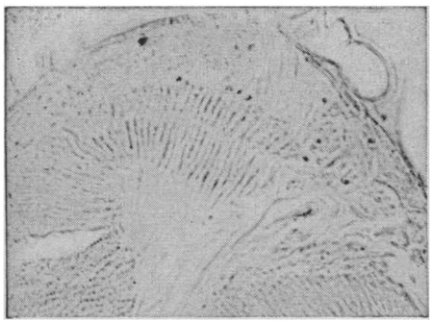
1. U. S. Department of Commerce Bureau of the Census Current Population Reports. *Educational Attainment Series P-20 No. 194* (1970).
2. L. Wirth and H. Goldhamer, in *Characteristics of the American Negro*, O. Klineberg, Ed. (Harper, New York, 1944), p. 290.

Advocacy in Congress

In their letter (29 Jan.) Lawrence D. Longo and Gordon G. Power have raised some important issues in the matter of science and politics. Longo and Power were moved to write after but "one encounter with one congressman," but their report is replete with intuitive political insights. The Public Affairs Committee of the Federation of American Societies for Experimental Biology (FASEB), in its recent experiences with the current mood of the Congress in general, and congressmen in particular, can only add "Amen" to the critical comments of Longo and Power's congressman, Jerry L. Pettis, wherein scientists got poor marks for their efforts at communicating with Congress. Mea culpa! How can we improve?

. . . I would like to make one strategic point. The advocacy of science in the Congress is made best face to face, preferably in the congressman's office and at a time when the issue at stake is not "under the gun." Ideally it is made in an earlier attitude-formulating phase. Let no one, least of all a scientist, poor mouth the educational effort thus made. Above all, let the advocate of science be aware that he is precisely that, an advocate. This is far removed from his traditional self-image of the disinterested observer and student of nature, seeking truth in an *n* dimensional world. In Congress, things are different. In a world of lawyers and laws, the role of advocacy is the norm. In the lawyers' two-dimensional world the palatable, viable, and durable "truth" is found by a process of accommodation (pejoratively, "compromise") between advocates of a position and their counterposed opponents. The "truth," the legislator presupposes, lies somewhere on a straight line between. Let hearings be held, and let advocate and counter-advocate hold forth. The weightier testimony of the one or the other will lead, by accommodation, to a kind of center of gravity, and there, voila! is the "truth." That may not be the scientist's path to the "truth," but the path leads to a world of understanding and a frame of reference about which we ought to know for our own good.

HOWARD A. SCHNEIDER
Public Affairs Committee, Federation of American Societies for Experimental Biology, Institute of Nutrition, University of North Carolina, Chapel Hill 27514



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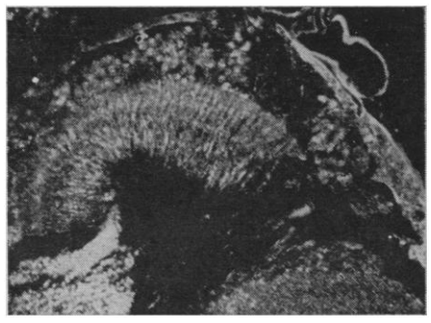

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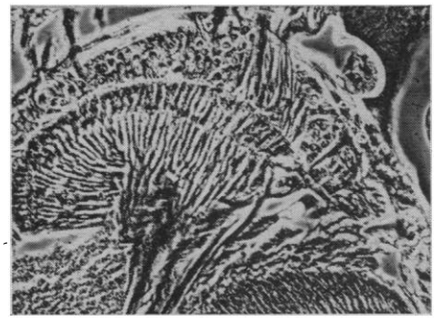

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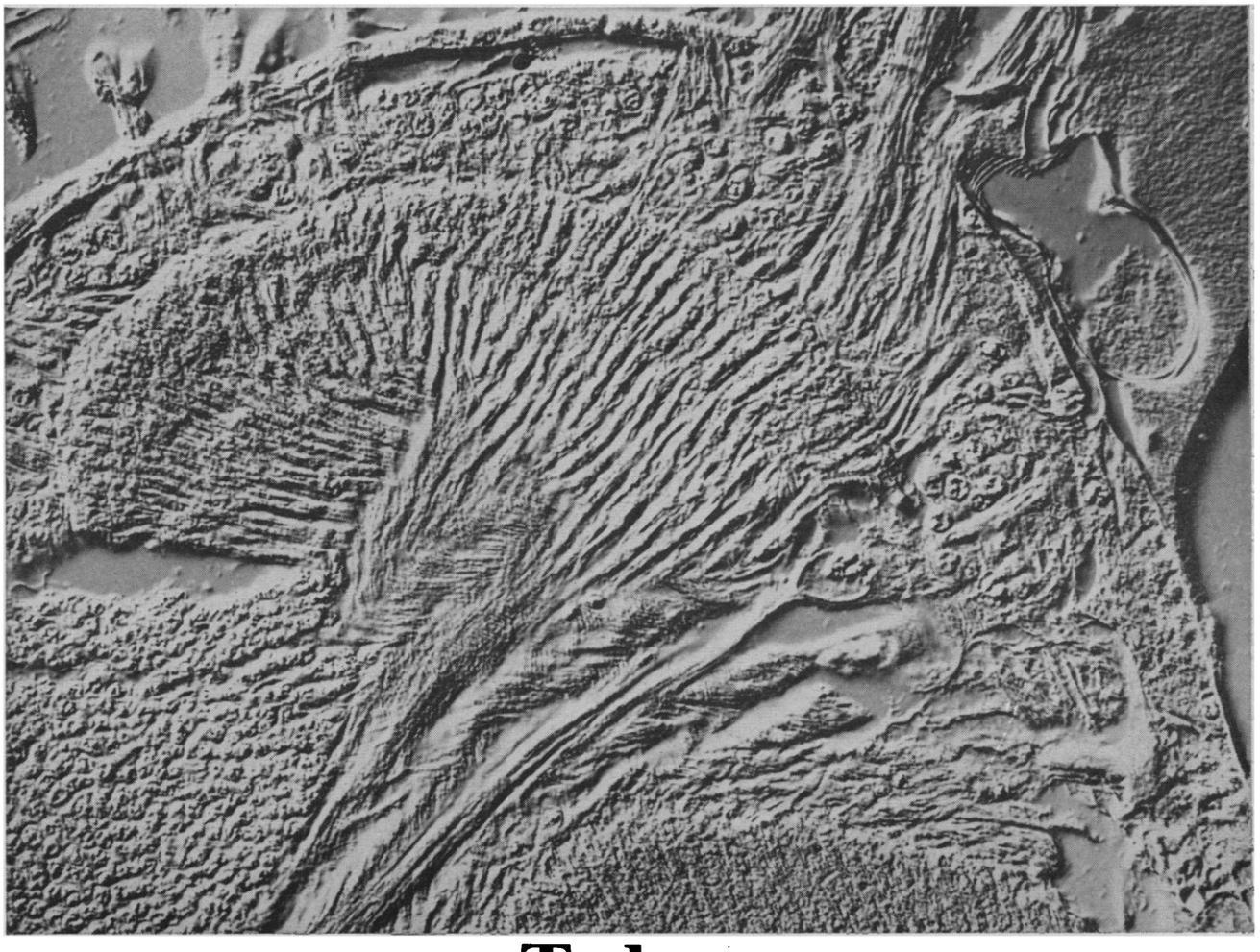

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2 April 1971, Volume 172, Number 3978 **SCIENCE**

Federal Support of Cancer Research

Cancer is an enemy of all mankind, and whoever helps to attenuate its effects will be the benefactor of untold billions of people. With so much at stake the public would like to believe that a massive centrally directed program could conquer the disease. Unfortunately a sharply focused effort has no guarantee of success and could damage other health research programs.

The basic nature and origins of cancer are complex. Countless related diseases are subsumed under the name of cancer with numberless causes, different courses, and different prognoses. For example, it has been demonstrated that 110 viruses and over 1000 chemical substances can produce cancer in animals.

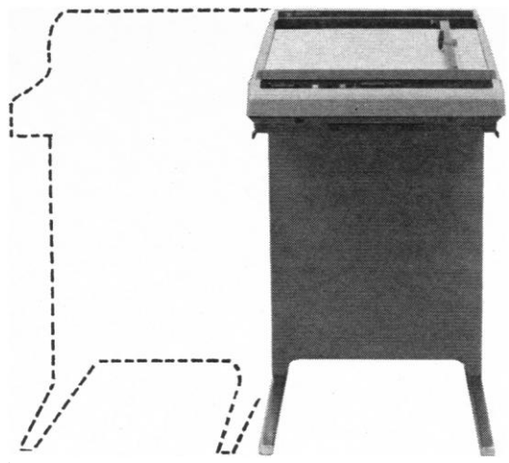
A major recent source of information on the status of cancer research is the report of the National Panel of Consultants on the Conquest of Cancer.* The report devotes much attention to results of laboratory studies on the disease. These are interesting and hold much promise. However, the report also points out, "Cancer prevention offers greater possibilities for the control of cancer and the saving of human lives than any other measure now at hand. Many, perhaps most, human cancers can now be prevented. The most important environmental causal agent in the production of internal cancer today is the prolonged inhalation of cigarette smoke." Other preventable cancers include those due to environmental agents such as arsenic, asbestos, coal tar, and radiation. Fragmentary evidence indicates the heavy involvement of yet unidentified environmental and social factors that may be preventable. Primary cancer of the liver may be as much as 500 times more frequent in the African population of Mozambique than among black people in the United States. The probable cause is aflatoxin, a carcinogen produced by a mold that can grow on peanuts or cereal grains. Cancer of the colon and rectum is the leading internal cancer in the United States but is infrequent in Mexico and Latin America. American women have about seven times more cancer of the breast than Japanese women. Incidence of stomach cancer is high in some countries but has been decreasing in the United States. Sharp discrepancies in cancer incidence seem related to environmental, not genetic, factors since they hold true for people with similar genetic constitutions in different environments.

Next to prevention, the most effective approach to cancer seems to be early detection and treatment. Statistics show that the prognosis deteriorates badly as the cancer becomes more advanced. Cytological tests, notably the one developed by Papanicolaou, have been very helpful in early detection of cancer, leading to successful treatment. Chemical and immunological tests for early detection seem promising, and they will certainly be developed further. Very tantalizing but still unevaluated are hopes that immunological knowledge and techniques may prove helpful in the treatment of cancer.

In view of the complexity of the diseases known as cancer, we cannot reasonably hope for a magical single cure. The time that will be required for substantial attenuation of the effects of cancer is decades. Increase in long-term support for cancer research is fully justifiable and should be implemented. However, the likely result of a hurry-up-and-wait crash program is wreckage of the nation's medical research enterprise without much counterbalancing progress in coping with cancer.

—PHILIP H. ABELSON

* "Report of the National Panel of Consultants on the Conquest of Cancer," *U.S. Senate Report 91–1402* (U.S. Government Printing Office, Washington, 4 December 1970), p. 12.



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