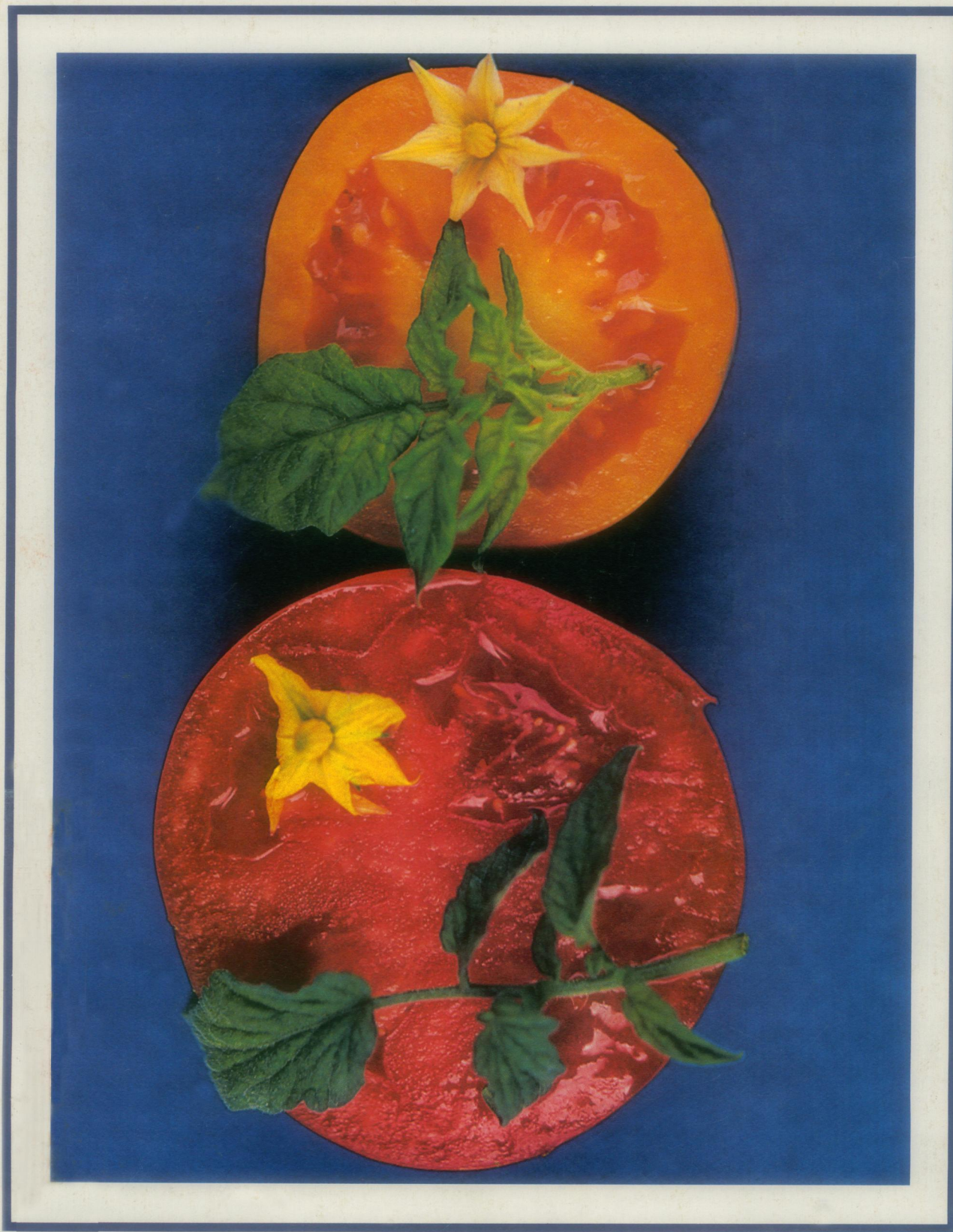


2 SEPTEMBER 1983 · VOL. 221 · NO. 4614

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# SCIENCE

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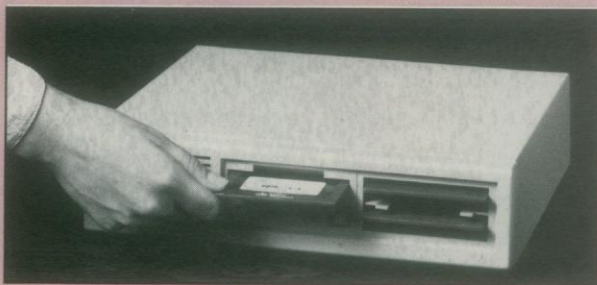
# BIOSYSTEMS UPDATE

## New Instrument for Multiple DNA Syntheses

Applied Biosystems has announced a new option for its Model 380A DNA Synthesizer which allows it to make three different oligonucleotides simultaneously. Syntheses can be started and stopped independently of one another so several users can share the same instrument. With this new option, the productivity of the 380A is tripled for less than one-fourth the original cost of the instrument. You also save bench space and minimize reagent consumption.



Three synthesis columns can be operated independently and simultaneously, tripling the productivity of the Applied Biosystems Model 380A DNA Synthesizer.

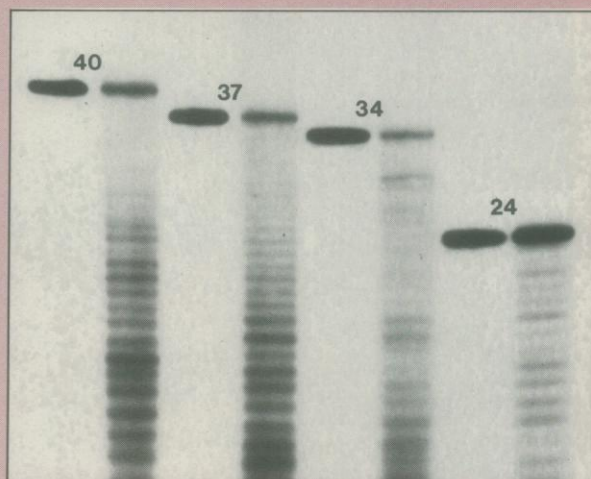


Disc drive for storage of your chemical methods.

This new option also includes hardware and software which allow you to use your own procedures. You can use other chemistries

and even make oligonucleotide analogues. All functions required for DNA synthesis are available and your methods are stored on a flexible disc. With 18 solvent/reagent reservoirs, the 380A offers flexibility unmatched by other synthesizers.

Applied Biosystems has the total solution for your DNA synthesis needs. We provide ultrapure, highly stable reagents, the key to successful syntheses. With our efficient phosphoramidite chemistry, you can make DNA with up to 50-60 bases without the use of the dimers, trimers or ligation required with other chemistries. This is the true test



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# TIAA announces MOD ONE...

a brand new concept in personal life insurance  
protection for families in the academic community that

- cuts first-year premiums up to 50%
- gives discounts of 33⅓% to 40% on large policies

Is digging up that first premium stopping you from providing all the financial protection your family deserves? Then here's really good news. With the introduction of MOD ONE\* October 1, 1982, Teachers Insurance has cut up to 50% from initial premiums on term policies of \$100,000 to \$249,000. And we've trimmed off even more for policies of \$250,000 and above. This means you now need only about half as much premium money "up front" to start a large new TIAA policy. Putting it another way, for roughly the same outlay as before you can now begin a new policy that provides twice as much immediate protection for your family!

Here's what men and women aged 35, for example, now pay for 5-Year Renewable Term policies of different amounts:

**First-Year Premiums for TIAA 5-Year Renewable Term Policies**

Policy Amount	\$50,000	\$100,000	\$150,000	\$200,000	\$250,000
<b>Issued to men aged 35</b>					
First-year premium	\$126.75	\$169.00	\$253.50	\$338.00	\$380.25
Premium per \$1,000	\$2.53	\$1.69	\$1.69	\$1.69	\$1.52
<b>Issued to women aged 35</b>					
First-year premium	\$110.25	\$147.00	\$220.50	\$294.00	\$330.75
Premium per \$1,000	\$2.20	\$1.47	\$1.47	\$1.47	\$1.32

As you can see, premium rates for policies of \$100,000 to \$249,000 are ⅓ less than those for smaller policies, and for policies of \$250,000 or more, they're 40% less. Substantially lower first-year premiums for all ages and big discounts for larger policies encourage everyone to consider the higher levels of family protection they may have felt they just couldn't afford until now.

Premiums for MOD ONE policies increase beginning with the second year, but generous dividends, credited concurrently, will automatically reduce those premiums. Under the present dividend scale, expected payments for the second and subsequent years of the 5-year policy period in the examples above will be identical to the premium for the first year shown. While dividends cannot be guaranteed for the future, of course, TIAA has paid dividends on life insurance each year since 1918.

**To receive personal illustrations** of new MOD ONE policies, mail the coupon, or phone the TIAA Life Insurance Advisory Center Toll Free at 800-223-1200 (in New York, call collect 212-490-9000). No one will call on you as a result of your inquiry.

**Eligibility** to apply for TIAA life insurance is extended to employees of colleges, universities, private schools, and certain other nonprofit educational and research institutions. The employee's spouse is also eligible provided more than half of their combined earned income is from a qualifying institution.

**Note to present TIAA policyowners:** MOD ONE premium rates apply only to policies issued on or after October 1, 1982, but cash dividends payable in accordance with the 1982 scale will continue to provide equitable treatment for policies issued prior to that date.

\*Modified first-year premium.



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**Life Insurance Advisory Center  
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Please mail me the facts about new TIAA MOD ONE life insurance policies with personal illustrations of low-cost Term policies for my age.

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Nonprofit educational or scientific employer (college, university, private school, etc.) _____	
If your spouse is also eligible according to the rules at left, please fill in: _____	
Spouse's name _____	Birthdate _____

# SCIENCE

<b>LETTERS</b>	Thyroid Protection: <i>F. von Hippel</i> ; Dioxins: <i>K. A. Wilson</i> ; Facial and Cardiac Anomalies: <i>J. R. Siebert</i> ; R-DNA: <i>L. K. Bleyman</i> ; Love Canal: <i>C. W. Heath, Jr., et al.</i> . . . . .	906
<b>EDITORIAL</b>	Language and Science Policies of New Nations: <i>R. Kaplan</i> . . . . .	913
<b>ARTICLES</b>	Thermoelectric Energy Conversion with Solid Electrolytes: <i>T. Cole</i> . . . . .	915
	Molecular and Cell Isoforms During Development: <i>A. I. Caplan, M. Y. Fiszman, H. M. Eppenberger</i> . . . . .	921
<b>NEWS AND COMMENT</b>	NIH Seeks Reduction in "Indirect Costs" . . . . .	929
	Computer Break-Ins Fan Security Fears . . . . .	930
	Universities Denounce DOE's Secrecy Rules . . . . .	932
	Columbia Awarded Biotechnology Patent . . . . .	933
	<i>Briefing</i> : EPA Planned to Alter Carter Policy on Cancer; California Universities Block Animal Rights Bill; NSF Urged to Support Academic Supercomputing . . . . .	934
<b>RESEARCH NEWS</b>	Extinctions and the History of Life . . . . .	935
	A Visible Free Electron Laser in France . . . . .	937
	Fading El Niño Broadening Scientists' View . . . . .	940
<b>AAAS NEWS</b>	AAAS and Science on the Air: <i>J. Wrather</i> ; Call for Nominations: 1984 General Election; A Call for Help; Call for Papers on Secrecy and Openness in Scientific and Technical Communication; Nominees Invited for Scientific Freedom and Responsibility Award; International Activities in Detroit; <i>The Dark Side of Science</i> Published . . . . .	942

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<b>BOOK REVIEWS</b>	A Geologic Time Scale, reviewed by G. B. Dalrymple; Comparative Social Recognition, W. G. Holmes; Ceramics, Chronology, and Community Patterns, B. D. Smith; Books Received .....	944
<b>REPORTS</b>	The Possible Link Between Net Surface Heating and El Niño: B. C. Weare .....	947
	Single Gene Mutations in Tomato Plants Regenerated from Tissue Culture: D. A. Evans and W. R. Sharp .....	949
	Multiclonal Origin of Polyps in Gardner Syndrome: S. H. Hsu et al. ....	951
	Cell-to-Cell Transfer of Interferon-Induced Antiproliferative Activity: R. E. Lloyd, J. E. Blalock, G. J. Stanton .....	953
	Human Fetal Muscle and Cultured Myotubes Derived from It Contain a Fetal-Specific Myosin Light Chain: R. C. Strohman et al. ....	955
	Identification of Pro-Opiomelanocortin-Derived Peptides in the Human Adrenal Medulla: C. J. Evans et al. ....	957
	Normalizing Effect of an Adrenocorticotrophic Hormone (4-9) Analog ORG 2766 on Disturbed Social Behavior in Rats: R. J. M. Niesink and J. M. van Ree .....	960
	Isolation of Lamellar Bodies from Neonatal Mouse Epidermis by Selective Sequential Filtration: S. Grayson, A. D. Johnson-Winegar, P. M. Elias .....	962
	Evidence for the Recessive Nature of Cellular Immortality: O. M. Pereira-Smith and J. R. Smith .....	964
	Aged Rats: Recovery of Motor Impairments by Intrastriatal Nigral Grafts: F. H. Gage et al. ....	966
	Haloperidol-Induced Plasticity of Axon Terminals in Rat Substantia Nigra: F. M. Benes, P. A. Paskevich, V. B. Domesick .....	969
	Neurofilament Accumulation Induced in Synapses by Leupeptin: B. I. Roots .....	971
	Regional Brain Concentrations of Neuropeptides in Huntington's Chorea and Schizophrenia: C. B. Nemeroff et al. ....	972
	Opiate Antagonists Improve Spatial Memory: M. Gallagher, R. A. King, N. B. Young .....	975
	Technical Comments: Optimization: A Result or a Mechanism?: J. E. R. Staddon and J. M. Hinson; J. E. Mazur .....	976

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## COVER

New mutant tomato. This orange tomato is controlled by a recessive single gene mutation and was recovered as a somatic genetic variant following plant regeneration from cell cultures of the standard red tomato (var. UC828B). This mutation simultaneously alters fruit color, flower color, and leaf pigmentation. Recovery of such single gene mutations is evidence that plant cell culture technology can be used as an important new mutagenic tool. See page 949. [David A. Evans and William R. Sharp, DNA Plant Technology Corporation, Cinnaminson, New Jersey 08077]

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New crustal rock continues to be generated by the upwelling of the mantle under the midocean ridge that girdles the Earth. Spreading outward from the ridge, the new ocean floor pushes the continental rafts this way and that.

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Thomas Shenk, State Univ. of New York, Stonybrook, NY

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Hilary Koprowski, The Wistar Institute, Philadelphia, PA

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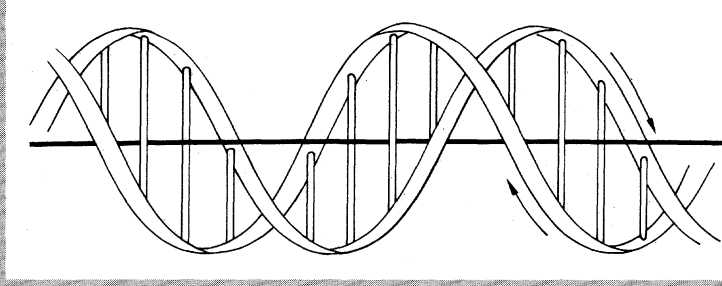
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**THE SETTING:** Boston Park Plaza Hotel and Towers, Boston, Massachusetts. NATURE has reserved the Imperial Ballroom, as well as adjacent ballrooms, for the conference and a limited exhibition, which will include poster sessions. The Park Plaza is well-located at Park Plaza and Arlington Street, just off the famous Boston Common.

**TO REGISTER FOR CONFERENCE:** Please use registration form opposite, or call (212) 689-5900. Fee for full 3-day conference is \$325, which includes all sessions and materials.

**CONFERENCE DINNER:** Conference dinner will be held on Tuesday evening, September 20th. Dinner tickets are only \$25. NOTE: To insure seating, please include your dinner ticket requirements with your Conference Registration.

**POSTER SESSIONS:** A limited space for poster sessions is available. Please submit your request for a display, along with a brief description of the subject presented, to Nature Publishing Company, 15 East 26th Street, New York, NY 10010. Attention: Poster Editor.

**ROOM RESERVATIONS:** A block of rooms has been set aside for participants, but space is limited. Rooms must be reserved directly with the Hotel, at (617) 426-2000 or 800 225-2008. Be certain to mention your participation in the Conference, to take advantage of these special lower rates: Singles: \$65, \$70 and \$75; Doubles: \$77, \$82 and \$87.



# MOLECULAR BIOLOGY NOW & TOMORROW—THIRTY YEARS OF DNA CONFERENCE PROGRAM—SEPTEMBER 19-21

## MONDAY, 19 September

- 9:00– 9:15 J. Maddox, Editor  
(Nature) Welcome  
9:15– 9:45 J.D. Watson (Cold  
Spring Harbor)  
Introduction

### DNA—structure and replication

Thirty years ago, it was not certain that DNA usually forms a right-handed spiral; now there is left-handed DNA as well.

- 9:45–10:00 Paul Doty (Harvard)  
10:00–10:30 A. Rich (MIT) Z DNA  
10:30–11:00 COFFEE and Exhibition  
Viewing  
11:00–11:30 J. Wang (Harvard)  
Structure of DNA  
11:30–12:00 M. Ptashne (Harvard)  
Protein-DNA  
interactions  
12:00–12:30 DISCUSSION  
12:30– 1:45 LUNCH and Exhibition  
Viewing

### Gene expression

Genes often contain apparently irrelevant stretches of DNA whose function is far from clear, but at least the relationship of these structures to the expression and evolution of genes is being understood.

- 1:45– 2:00 A. Rich (MIT)  
CHAIRMAN  
2:00– 2:30 H. Boedtker (Harvard)  
Collagen genes  
2:30– 3:00 T. Maniatis (Harvard)  
Globin genes  
3:00– 3:15 DISCUSSION  
3:15– 3:45 COFFEE and Exhibition  
Viewing  
3:45– 4:30 W. Gilbert (Biogen)  
Spliced genes  
4:30– 5:00 DISCUSSION

5:00 Exhibition Viewing

## TUESDAY, 20 September

### Development biology

Differentiation remains largely unknown territory, but the rearrangement of immunoglobulin genes and sequence of gene functions in *Drosophila* may be more general models.

- 9:00– 9:15 S. Brenner (LMB)  
CHAIRMAN  
9:15– 9:45 D. Baltimore (MIT)  
Antibody production  
9:45–10:15 R. Jaenisch (Hamburg)  
Mammalian  
development  
10:15–10:30 DISCUSSION  
10:30–11:00 COFFEE and Exhibition  
Viewing  
11:00–11:30 G. Rubin (U. of C. at  
Berkeley) *Drosophila*  
development  
11:30–12:00 H. Lodish (MIT)  
12:00–12:30 DISCUSSION  
12:30– 1:45 LUNCH and Exhibition  
Viewing

### Biomedicine

New methods of manipulating genes promise to throw light on many important medical problems.

- 1:45– 2:00 D. Goeddel  
(Genentech)  
CHAIRMAN  
2:00– 2:30 C. Weissmann (Zurich)  
Lymphokines  
2:30– 3:00 Y.W. Kan (UCSF)  
Prenatal diagnosis  
3:00– 3:15 DISCUSSION  
3:15– 3:45 COFFEE and Exhibition  
Viewing  
3:45– 4:30 R. Weinberg (MIT)  
Oncogenes in  
tumorigenesis

4:30– 5:00 DISCUSSION  
5:00 Exhibition Viewing

## WEDNESDAY, 21 September

### Future developments

The most obvious but by no means the only applications of genetic manipulation are in the medical field.

- 9:00– 9:15 C. Weissmann (Zurich)  
CHAIRMAN  
9:15– 9:45 H. Temin (Wisconsin)  
Cancer  
9:45–10:15 D. Goeddel  
(Genentech)  
Pharmaceuticals  
10:15–10:30 DISCUSSION  
10:30–11:00 COFFEE  
11:00–11:30 F. Bloom (Salk)  
Brain  
11:30–12:00 H. Goodman (Mass  
Gen.) Plants  
12:00–12:30 DISCUSSION  
12:30– 1:45 LUNCH and Exhibition  
Viewing

### Closing symposium

- 1:45– 2:00 F.H.C. Crick (Salk)  
CHAIRMAN  
2:00– 2:30 J. Jackson (Columbia)  
Neuropeptides  
2:30– 3:00 R. Mulligan (MIT) Gene  
transfer  
3:00– 3:30 G. Struhl (Harvard)  
Segmentation in  
insects  
3:30– 3:45 DISCUSSION  
3:45– 4:00 COFFEE  
4:00– 4:45 S. Brenner (LMB)  
Outlook  
4:45– 5:00 J. Maddox (Nature)  
Valediction  
5:00 CONFERENCE ENDS

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# Language and Science Policies of New Nations

In this second half of the 20th century, a large number of the new nations that have emerged from the shadow of colonialism are facing serious language problems. Many of these problems stem from the multilingual character of the diverse populations that have been collected into single nations. Others are due to inadequate appreciation of the national and international uses of language.

Normally, two kinds of languages are available to new governments: indigenous languages, which are usually spoken by small populations or by those who are geographically restricted, and languages of wider communication, spoken by large populations around the world.

If the nation chooses an indigenous tongue, it is common to select the one spoken by its largest population. Such a choice may create serious internal problems because the remaining populations may resist the imposition of another group's language. More trying, however, is the fact that the indigenous language may not allow easy access to science and technology. It may lack the necessary technical vocabulary, and translation may be difficult. This, in turn, may create the special problem of trying to modernize the language itself.

If the new nation chooses a language of wider communication, it is easiest to choose the old colonial language, since some of the population already speak it, but such a choice may have negative connotations. Or a nation may choose a language for cultural or religious solidarity (for instance, Arabic), but such a choice may work against aspirations for modernization. In general, a nation selects a language of wider communication to have access to science and technology and thus to modernization and a higher standard of living. However, world languages that provide such access constitute a limited set: English, French, German, and Russian.

In order to cope with the problem, a number of nations have adopted systems in which a child upon entering school is taught in his indigenous language and learns a regional language at the elementary level, a national language at the secondary level, and a world language at the tertiary level. Such approaches are demanding on the student and the educational system, which must provide teachers and materials in all languages involved. These demands are very costly and may restrain the intricately layered educational program necessary for nurturing a self-sustaining science.

The problem is made more complicated by modern systems of information storage and retrieval. Most of the information already stored is in English. English speakers are the largest contributors to and users of these systems, and they are also the system managers. There is therefore a bias toward English that works against nonnative speakers of the language. Although some of this bias is overcome by the substitution of mathematical language, some still remains by virtue of language-specific semantic categories and the fact that the original text is probably in English.

It seems reasonable to assert, however difficult it may be to accept, that knowledge of a world language, especially English, is essential to the welfare of the new nations. Any other course is tantamount to restricting their capability for modernization. New nations must find a balance between the cultivation of indigenous culture-rich language and the need for a world language. Japan meets this need with elaborate translation services, and Saudi Arabia has undertaken to train a large scientific and technical manpower pool in English. And other strategies can be adopted.

The fact remains that many developing nations do not have the resources to invest in proper language strategies, and many have made language decisions often based on political criteria. As dependence on developed nations and their information systems grows, the language problems of new nations are intensified. Time is running out, but it is still possible to examine linguistic alternatives and develop better language policies for national needs.—ROBERT KAPLAN, *President, National Association for Foreign Student Affairs, 1860 19th Street, NW, Washington, D.C. 20009*

# Announcing The 2nd Annual AAAS Science Photography Contest

Have you taken a photograph that stimulates curiosity about some aspect of the world we live in, that celebrates its beauty, or that helps explain how it works? The American Association for the Advancement of Science, publisher of *Science*, *Science 83*, and *Science Books and Films*, is looking for those special photographs that compel the eye and excite the mind.

## FOUR FIRST PRIZES \$1000

First prizes of \$1000 each will be awarded in four categories: The Physical World; the Living World; the Manmade World; and the Micro World (SEM's & TEM's). Honorable Mention Photographs will receive \$100. All winners will receive a certificate, suitable for framing. A selection of

winning photographs will be published in the May issue of *Science 84* and exhibited at the AAAS annual meeting and other sites around the country. Judging criteria will include subject novelty, aesthetic quality, and technical excellence or difficulty.

## SEPARATE STUDENT CONTEST

Student entries are encouraged and will be judged separately (group or class entries are acceptable). Winners will receive certificates and a \$100 prize. Mark the student box on the entry form.

## CONTEST RULES

**Eligibility.** The contest is open to everyone except employees of AAAS and their relatives.

**Entries.** You may submit up to 5 entries (a sequence counts as one). Photographs must have been taken by you and must be previously unpublished in any medium intended for the general public. Entries may be black and white or color, unmounted prints (no larger than 8 by 10 inches) or transparencies; they must not be mounted in glass. Duplicates may be entered, but originals must be available for publication. Entries must be accompanied by explicit caption information that identifies the content of each photograph and any special technique involved in its creation. Each photograph entered must bear photographer's name and address.

There is a \$5 entry fee (one fee per contestant; make check payable to AAAS Science Photography Contest). Please enclose the official entry form or a photocopy.

**Rights and responsibilities.** The AAAS has the right to publish, exhibit, and use for promotional purposes any winning photograph. The AAAS assumes no responsibility for photographs entered. A stamped, self-addressed envelope must accompany all entries if you wish them returned. Submission of an entry constitutes acceptance of all rules and conditions. **Deadline.** All entries must be postmarked no later than December 1, 1983.

**Send all entries to:** Photography Contest, AAAS, 1101 Vermont Ave., N.W., 10th Floor, Washington, D.C. 20005

## OFFICIAL ENTRY FORM

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

DAYTIME PHONE # \_\_\_\_\_

TOTAL # OF ENTRIES \_\_\_\_\_

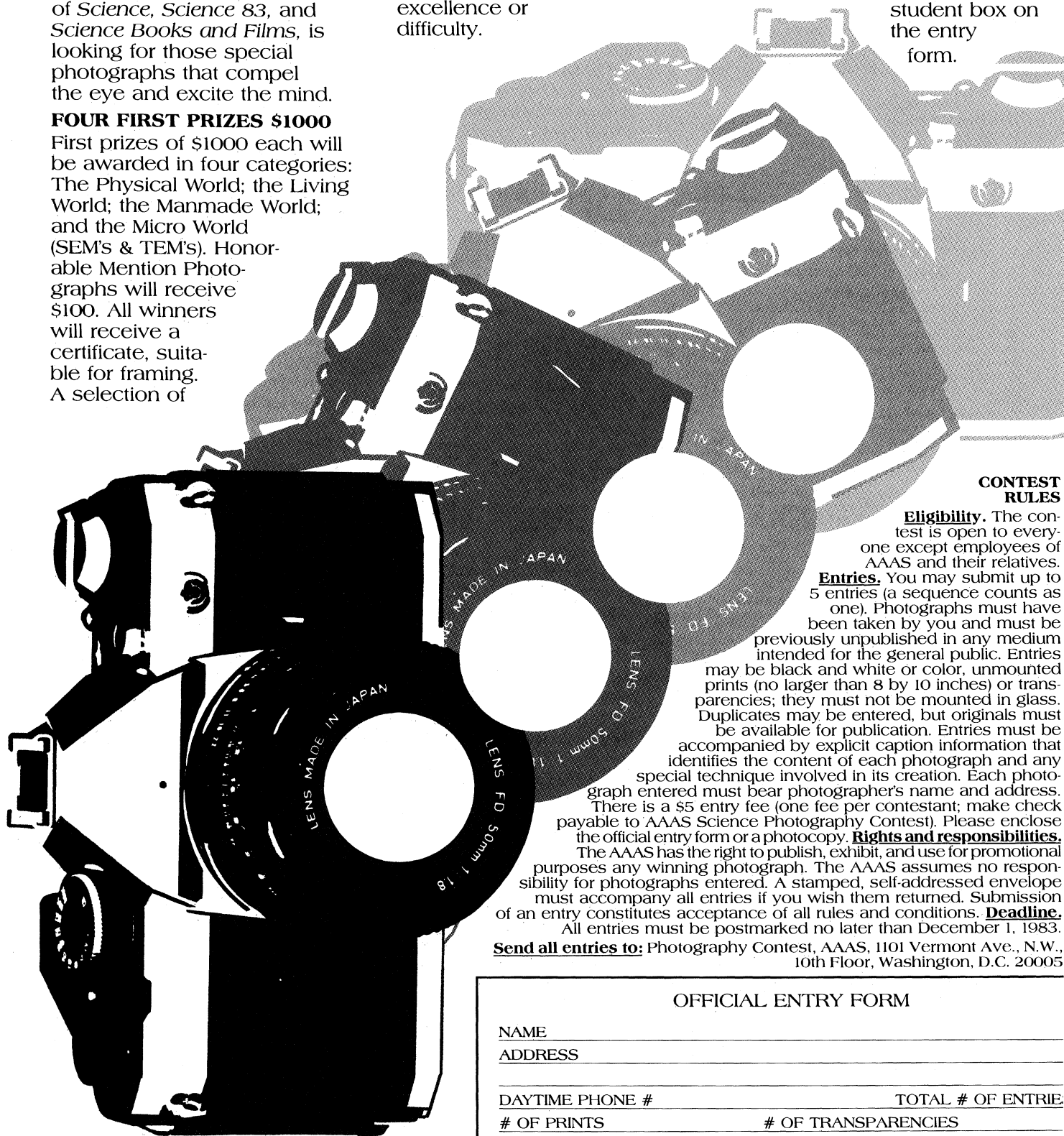
# OF PRINTS \_\_\_\_\_

# OF TRANSPARENCIES \_\_\_\_\_

CATEGORIES ENTERED \_\_\_\_\_

☐ Student entry

Don't forget entry fee and caption information





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