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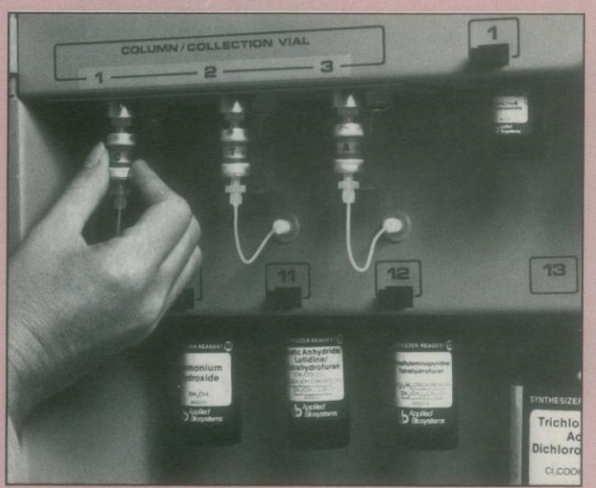
SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

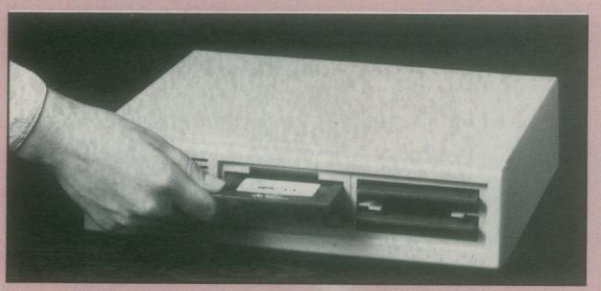
BIOSYSTEMS UPDATE

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.



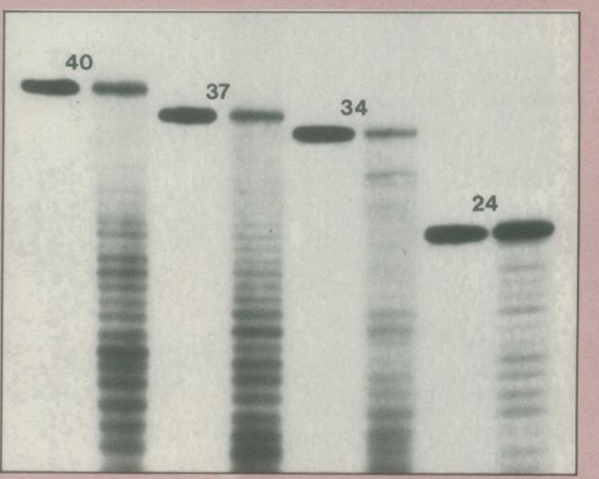
Three synthesis columns can be operated independently and simultaneously, tripling the productivity of the Applied Biosystems Model 380A DNA Synthesizer.



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



Autoradiogram of ^{32}P labeled oligonucleotides up to 40 bases long. Efficient phosphoramidite chemistry allows direct synthesis of long oligonucleotides.

of coupling efficiency. Only the Applied Biosystems Model 380A DNA Synthesizer can synthesize long oligonucleotides quickly and with high product yields. And if your requirements for DNA are large, you can now synthesize three times as much with one instrument.

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ISSN 0036-8075

2 September 1983

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SCIENCE is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. Second-class postage (publication No. 484460) paid at Washington, D.C., and at an additional entry. Now combined with **The Scientific Monthly®** Domestic individual membership and subscription (51 issues): $53. Domestic institutional subscription (51 issues): $90. Foreign postage extra: Canada $24, other (surface mail) $27, air-surface via Amsterdam $65. First class, airmail, school-year, and student rates on request. Single copies $2.50 ($3 by mail); back issues $3 ($3.50 by mail); Biotechnology issue, $5 ($5.50 by mail); classroom rates on request. **Change of address:** allow 6 weeks, giving old and new addresses and seven-digit account number. **Postmaster:** Send Form 3579 to *Science*, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

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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]

September, 1983. Travel to a planet you know almost nothing about.

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The entire September issue of SCIENTIFIC AMERICAN is devoted to a single topic—The Dynamic Earth. Here, for the first time in one publication, the scientists who made the continental-drift revolution in geology present the new, unified picture of our planet.

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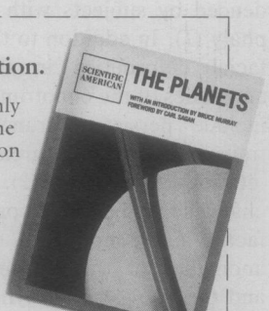

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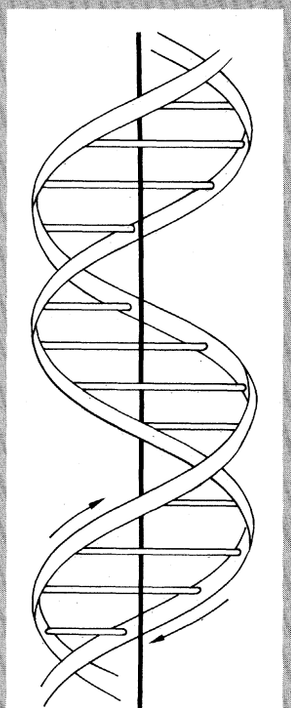

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THIRTY YEARS OF DNA

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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 immunoglobin 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

Program subject to changes and additions

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2 September 1983, Volume 221, Number 4614 **SCIENCE**

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.

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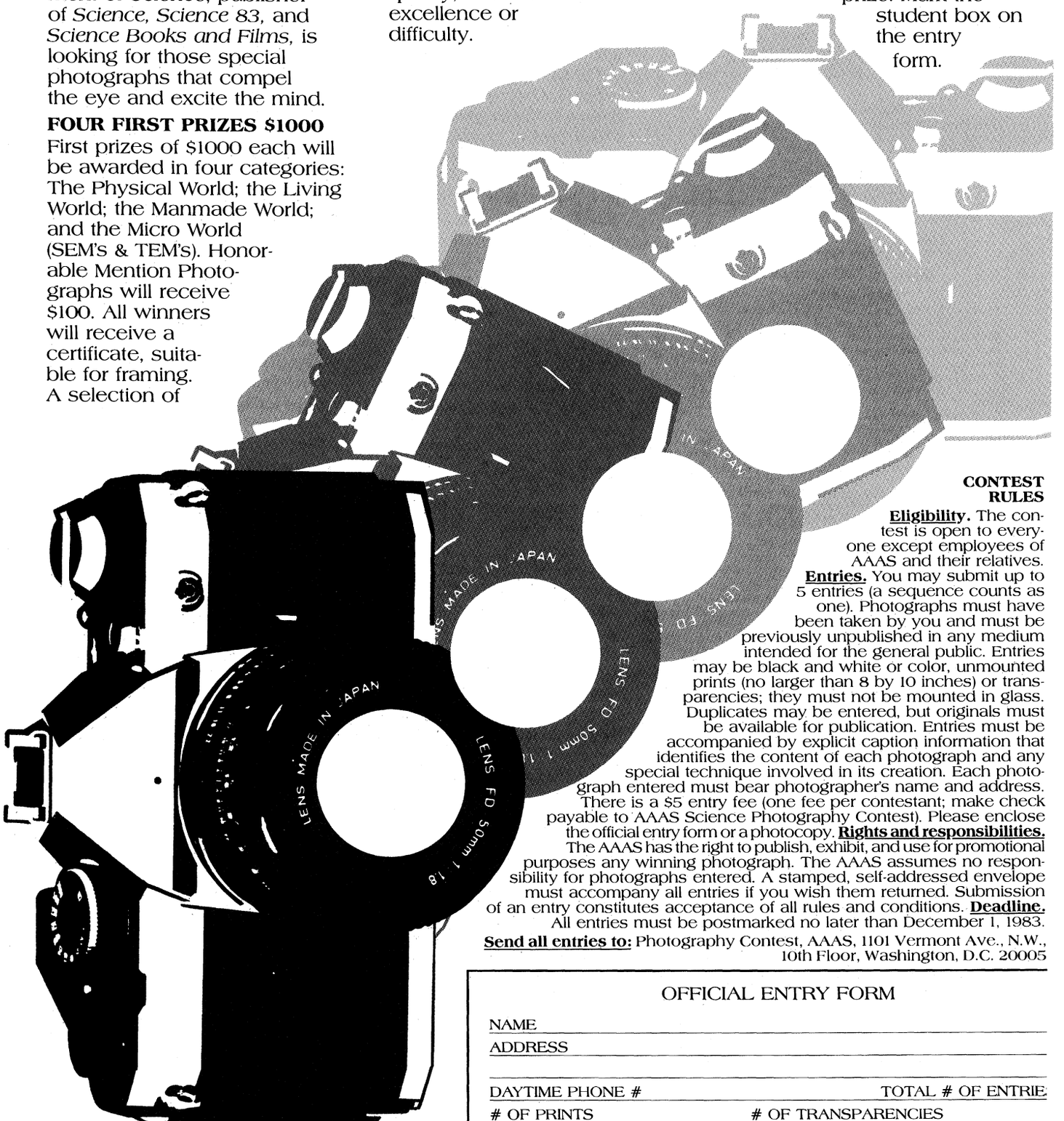
SEPARATE STUDENT CONTEST

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

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