SCIENCE

3 August 1973

Vol. 181, No. 4098

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

# THE LKB ADVANCED AMINO ACID ANALYZER

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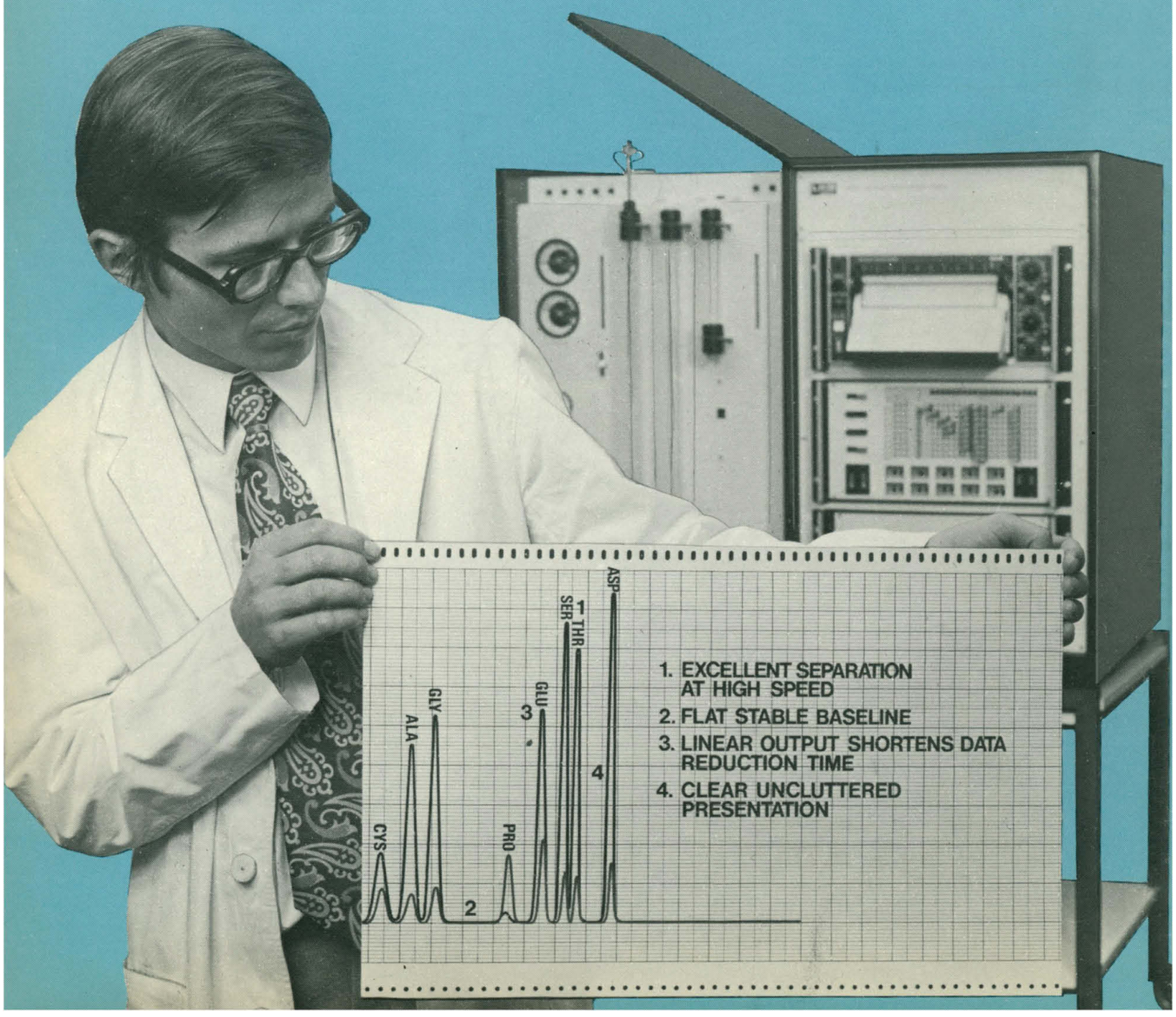
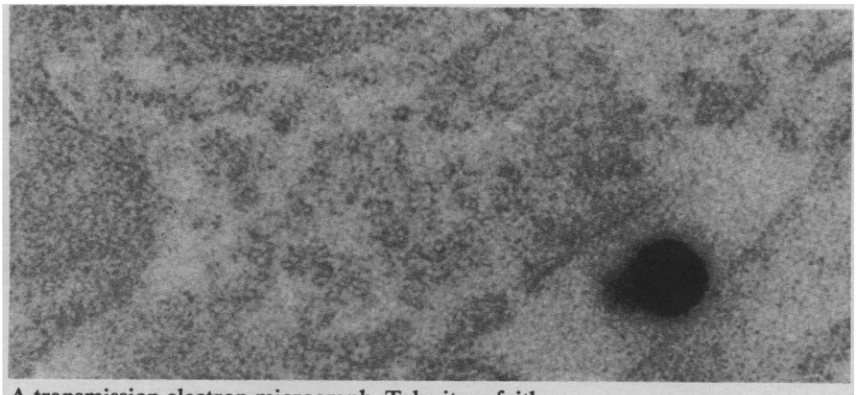
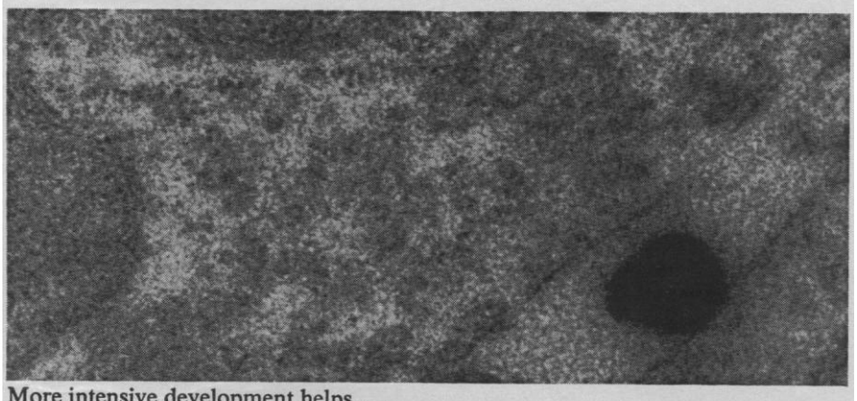


# We want to be useful ...and even interesting

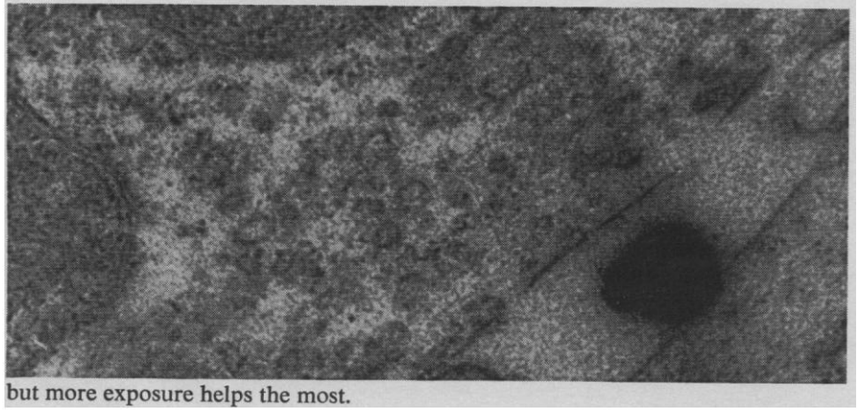
**The more electrons the better**



A transmission electron micrograph. Take it on faith.



More intensive development helps . . .



but more exposure helps the most.

*It is possible to learn from the new Kodak Data Book "Electron Microscopy & Photography" about differences in photographic behavior between electrons and light. Also a few darkroom hints. The publication can be obtained from suppliers of Kodak materials for electron micrography. Or write to Dept. 756, Kodak, Rochester, N.Y. 14650.*

**Finding a worthy successor to the photographic emulsion is proving very difficult.** In our work toward alternatives, older concepts need to be challenged. There is still time to do so.

It would be very nice to learn of a Ph.D. in solid-state physics or electrical engineering who has spent the past ten years at the cutting edge of progress in photosensing semiconductors (such as the charge-coupled devices and their relatives) and who is now ready to enter an environment like the Kodak Research Laboratories, where the technique for turning science into technology is well developed. At that game a person who works in isolation will not be happy. It involves too much management-type thinking, success in which is rewarded by invitation to do more of it.

Don't hesitate to raise your hand if 1) your experience is more in utilization of solid-state devices than in creating new ones, 2) you haven't been at it more than five years, 3) you have managed only a small number of engineers. You may still be the candidate who will lead another group at the Kodak Research Laboratories that is charged with the responsibility for bringing innovative imaging technologies somewhat closer to commercial fruition.

*Indications of availability for either of these two positions should be addressed to Dr. D. B. Glass, Kodak, Rochester, N.Y. 14650 (an equal-opportunity employer of men and women).*

Kodak

*Visualization one way or another*

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SCIENCE is published weekly, except the last week in December, but with an extra issue on the fourth Tuesday in November, by the American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Now combined with **The Scientific Monthly®**. Second-class postage paid at Washington, D.C.  Member rates on request. Annual subscription $30; foreign postage: Americas $4, overseas $6, air lift to Europe $18. Single copies $1 (back issues, $2) except **Guide to Scientific Instruments** which is $4. School year subscriptions: 9 months $22.50; 10 months $25. Provide 4 weeks notice for change of address, giving new and old address and zip codes. Send a recent address label. **Science is indexed in the Reader's Guide to Periodical Literature.**

**COVER**

Head of an Egyptian mummy, dated at about 700 B.C. The mummy, which was lent to the Smithsonian Institution by the University Museum, University of Pennsylvania, was unwrapped and examined for evidences of disease. See page 470. [John Levis, Department of Medical Photography, Mount Carmel Mercy Hospital and Medical Center, Detroit, Michigan]

# RNA
# DNA
# Transcription
# Hybridization
# Sequencing

| NEN TIDES TABLE | | |
|---|---|---|
| $^{32}P$ | $^{14}C$ | $^{3}H$ |
| d-ATP [$\alpha$-$^{32}P$] | d-ATP [$^{14}C$] | d-ATP [$^{3}H$] |
| d-CTP [$\alpha$-$^{32}P$] | d-CTP [$^{14}C$] | d-CTP [$^{3}H$] |
| d-GTP [$\alpha$-$^{32}P$] | d-GTP [$^{14}C$] | d-GTP [8-$^{3}H$] |
| TTP [$\alpha$-$^{32}P$] | TTP [$^{14}C$] | TTP [$^{3}H$] |
| ATP [$\alpha$-$^{32}P$] | ATP [8-$^{14}C$] | ATP [2, 8-$^{3}H$] |
| ATP [$\gamma$-$^{32}P$] | ATP [$^{14}C$ (U)] | CTP [5-$^{3}H$] |
| CTP [$\alpha$-$^{32}P$] | CTP [2-$^{14}C$] | GTP [8-$^{3}H$] |
| GTP [$\alpha$-$^{32}P$] | GTP [8-$^{14}C$] | UTP [5-$^{3}H$] |
| GTP [$\gamma$-$^{32}P$] | GTP [$^{14}C$ (U)] | UTP [5, 6-$^{3}H$] |
| UTP [$\alpha$-$^{32}P$] | UTP [2-$^{14}C$] | |

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able that describes resting heart rates in rats as a function of age and mature body size.

This is a request, then, to all scientists who maintain rat colonies to send to us information describing (i) the genetic background of their colony, (ii) resting heart rate, body weight, and age of animal when the data were collected, for as many different ages as possible, (iii) an estimate of the normal systolic blood pressure in the mature animal, and (iv) comments on any extenuating circumstances that might prevent the data from being typical, such as environmental stress, unusual temperatures, or malnutrition. This information would be greatly appreciated and will be used to maximum advantage. Readers interested in helping who do not have active colonies can pass this request along to those who are able to respond. All responders will be sent copies of any final compilations.


THOMAS G. COLEMAN
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## A New Metric System

I am pleased to note the strong effort *Science* is making to convert measurements in its pages completely to the metric system. Other scientific and engineering publications should do likewise. The sooner the whole country converts the better. Scientists should be able to change easily, and engineers can understand the arguments, despite their present adherence to the English system. The problem is to persuade the great mass of nontechnical people that they should change to the metric system. The difficulty with nontechnical people is more semantic than technical. They will be afraid of, and certainly resistant to, strange technical-sounding names which they will be asked to use instead of the familiar inch, foot, pound, and so forth.

I suggest, therefore, that a different approach be used, and that the new system be advertised as an "improvement" over the old. We should present a "new inch" (2.5 centimeters); a "new foot" (30 centimeters); a "new yard" (1 meter); a "new mile" (1500 meters)—already called the Olympic mile by sportswriters; a "new ounce" (weight) (30 grams); a "new pound" (0.5 kilogram); a "new ton" (1 megagram); a "new ounce" (volume) (30 milliliters); a "new pint" (0.5 liter); a "new quart" (1 liter), and so forth.

The nontechnical public need not be pressed with the metric equivalents. It would be sufficient to describe the new system as follows: the "new inch" and "new foot" are each about 2 percent larger than the corresponding old units. The "new yard" is about 9 percent larger than the old. The "new mile" is about 7 percent smaller than the old. The "new ounce" (weight) is about 6 percent larger than the old (avoirdupois). The "new pound" is about 10 percent larger than the old (avoirdupois). The "new ton" is about 2 percent smaller than the old "long ton." The "new ounce" (volume) is about 1 percent larger than the old. The "new pint," the "new quart," and the "new gallon" are each 6 percent larger than the old (United States, liquid). I suggest ignoring English units that are not widely used and eliminating differences between "liquid" and "dry," and "avoirdupois," since these distinctions are not widely appreciated by the nontechnical public anyway. The conversion factors between the new units become

12 new inches = 1 new foot
40 new inches = 3⅓ new feet = 1 new yard
5000 new feet = 1500 new yards = 1 new mile
16⅔ new ounces (weight) = 1 new pound
2000 new pounds = 1 new ton
16⅔ new ounces (volume) = 1 new pint
2 new pints = 1 new quart
4 new quarts = 1 new gallon

Besides the look of familiarity, the new units can have another selling point in that their sizes are for the most part a little larger than the old sizes. The housewife purchasing cloth by the yard, potatoes by the pound, or milk by the quart will be glad to be getting more than with the old units. Merchants can advertise this benefit, while any added price will be largely hidden among the regular rises due to inflation. Once the technical conversion has been made, the new old names can be phased out in another generation or two.


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3 August 1973, Volume 181, Number 4098 **SCIENCE**



# Freedom of Oceanic Research

The largest single appropriation of the earth's resources ever made is likely to occur in Santiago, Chile, at the forthcoming International Conference on the Law of the Sea. In preparatory meetings, a majority of the nations that border on the sea, particularly the less-developed nations, have argued for extending the zone of national jurisdiction out to 200 miles from shore. The region thus legally removed from the domain of the open sea would contain about 37 percent of the entire area of the oceans and be nearly equal to that of the continents.

Why should scientists be concerned with these arrangements made by politicians? Unfortunately, one of the property rights included under national jurisdiction is the right to control scientific research. Unless special provision can be made at Santiago to protect the freedom of ocean research, each coastal state will be able to prohibit or drastically limit out to 200 miles from shore all scientific work on the waters and the organisms they contain, the air above, and the sediments and solid earth beneath. One of the great ages of exploration of our planet could draw to a close.

Research in the oceans during the past 25 years has begun to revolutionize our understanding of the history of the earth and of the forces and processes that determine it; yet most of the work necessary for a real understanding remains to be done. Many problems are still unsolved in the boundary zones between the continental platforms and the ocean abyss, which in most places lie within 200 miles of the shore. Here run the great ocean currents, and the waters contain most of the sea's population and the largest diversity of living creatures.

The poor countries apparently believe that, unless they can control oceanic research in their new zones of national jurisdiction, it will become another tool in the hands of the rich and powerful to exploit the poor and the weak. The oceanographers contend, on the contrary, that freely published, openly available research will benefit all nations.

One difficulty is to define such universally beneficial "open" research. The International Council of Scientific Unions has proposed three criteria: (i) The coastal state shall have the right to participate by sending its own scientists aboard scientific vessels, (ii) it shall receive copies of all data and have equal access to all samples, and (iii) the results shall be published in the open scientific literature.

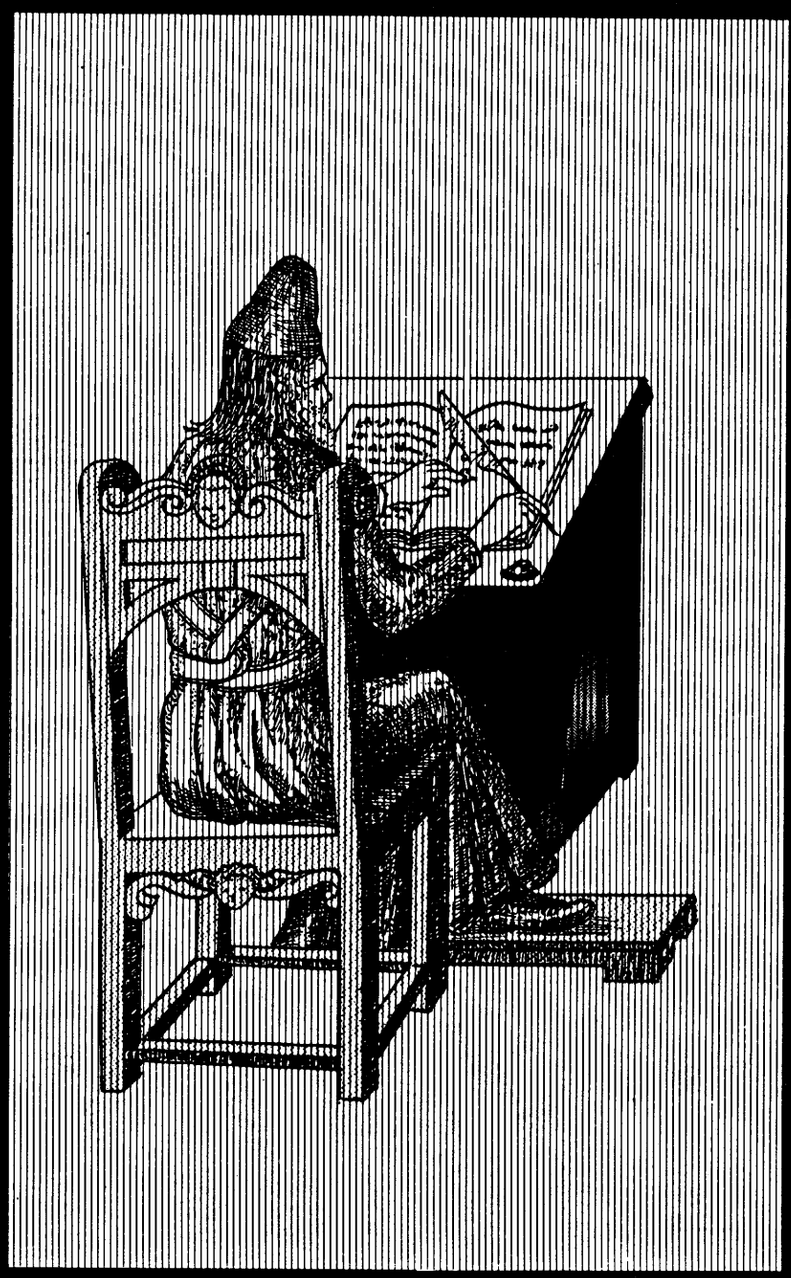
By themselves, these criteria may not be sufficient to protect the interests of the less-developed countries, because many of them possess neither the specialized manpower nor the institutional resources to be able to interpret the scientific data and results. Interpretations in which they can have full confidence would need to be provided either by their own trained nationals, or by an international organization in which the poor countries have a strong voice. An agreement to protect the freedom of "open" research might be possible at Santiago if the rich countries would pledge a definite portion of funds allocated for research at sea (say, 5 percent) to be used to support the provision of this assistance.

Unlike other political problems facing science today, the consequences of this dangerous threat to oceanic research could be irreversible. Scientists can help lessen the threat by making their voices heard.

—ROGER REVELLE

# A A A S - WESTINGHOUSE SCIENCE WRITING AWARDS 1973

**To encourage and recognize outstanding writing on the natural sciences and their engineering and technological applications (excluding medicine) in newspapers and general circulation magazines.**



Three awards of $1,000 each for science writing in newspapers with daily circulation of more than 100,000; in newspapers with daily circulation of less than 100,000 and in general circulation magazines.

Contest year.

Material must have been published within the United States, October 1, 1972 thru November 30, 1973.

Deadline for submitting entries is December 10, 1973. For entry blanks and detailed rules, contact Grayce A. Finger, (Dept. F), American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington, D.C. 20005.