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Vol. 180, No. 4092

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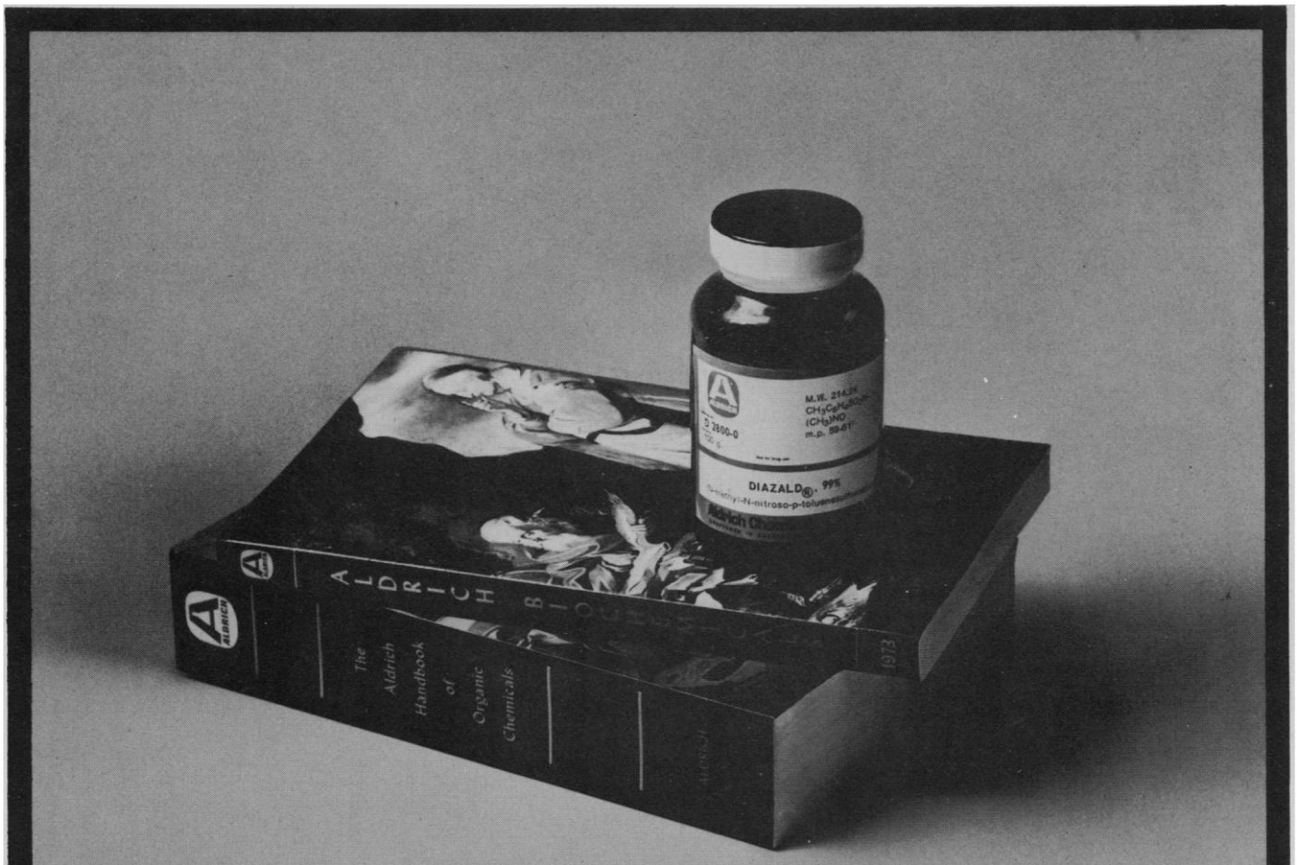

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SCIENCE

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COVER

Rewati, the strabismic "white" tiger at the National Zoological Park, Washington, D.C. An abnormality of the central visual pathway occurs in many albino mammals, can be related to the strabismus, and is present in the brain of Rewati's brother, Moni. See page 1287. [Smithsonian Institution, Neg. No. 73-1106 10A]

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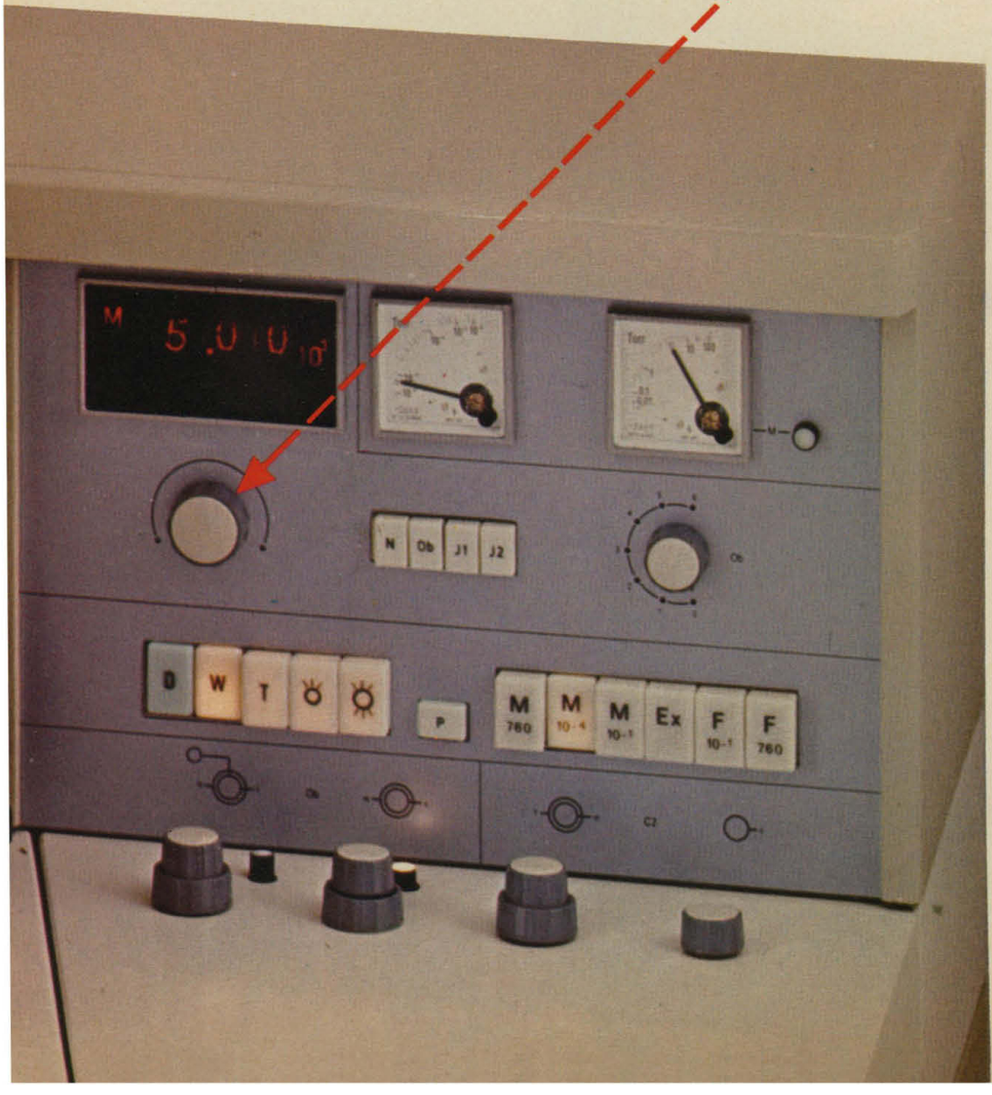

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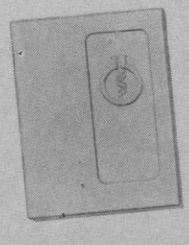

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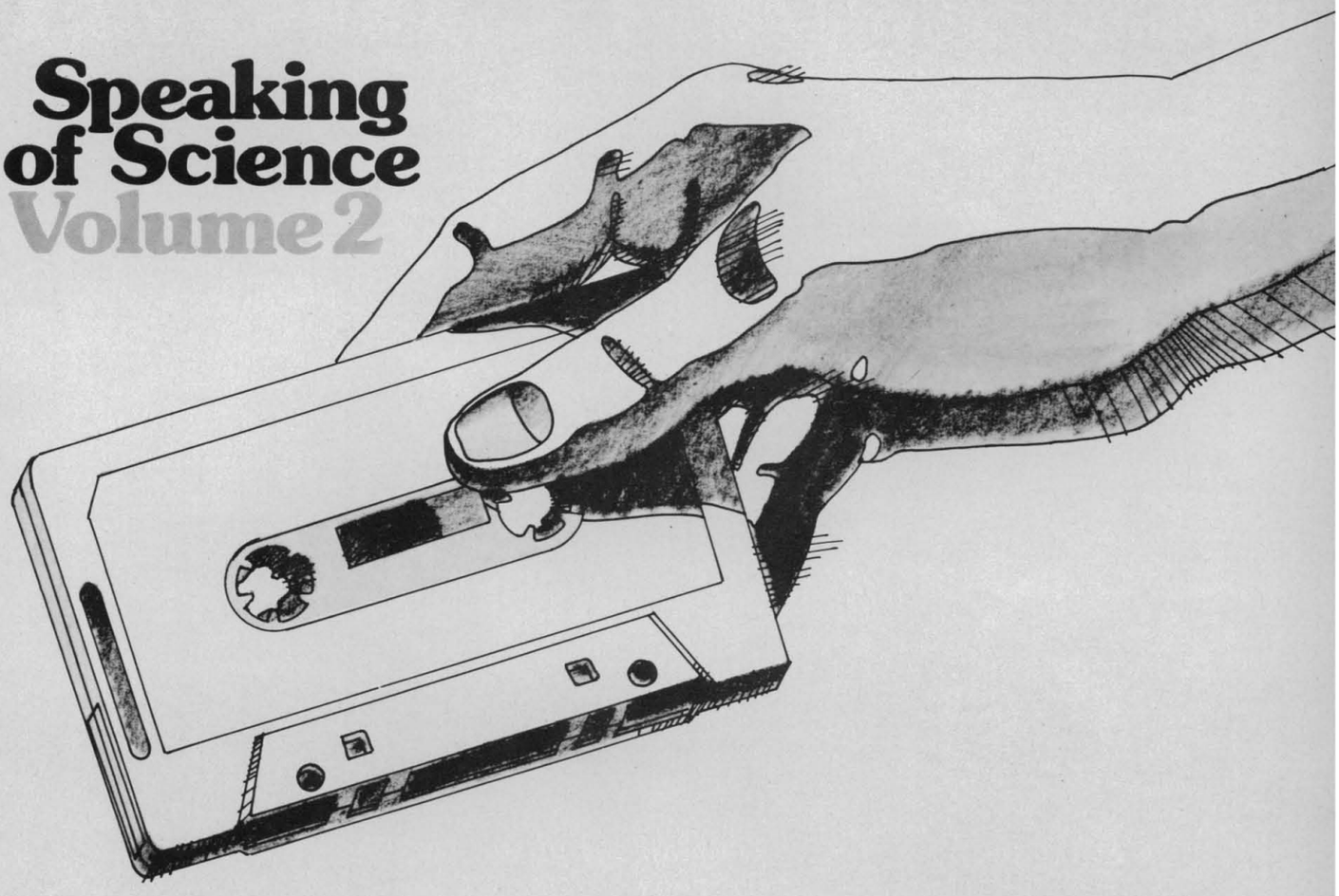

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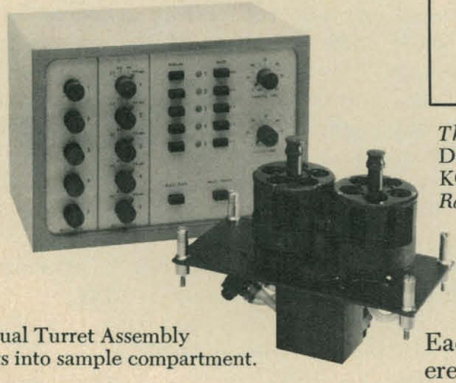

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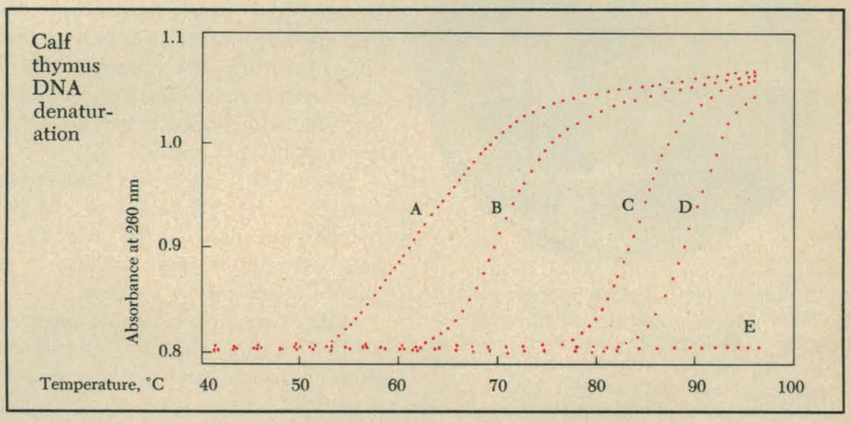
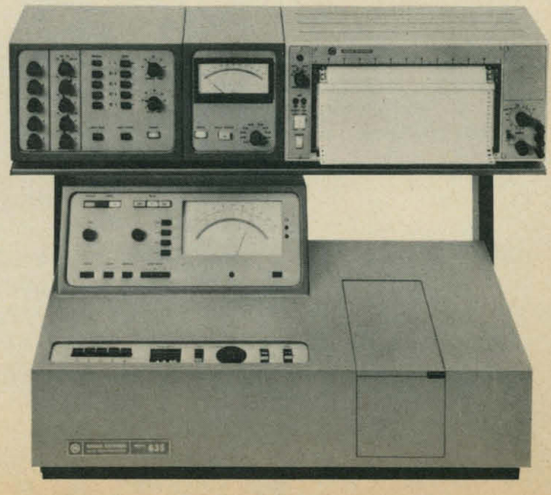


Thermal Denaturation of DNA: Effect of ionic strength on T_m. *Sample:* calf thymus DNA dissolved in pH7 phosphate buffer μ=0.005M with KCl additives: *Curve A:* no KCl; *Curve B:* 0.005M KCl; *Curve C:* 0.05M KCl; *Curve D:* 0.1M KCl; *Curve E:* control. *Range:* 0.5 abs full scale with 0.8 abs initial zero suppression. *Wavelength:* 260 nm.



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LETTERS

Support for Big Thicket

The excellent editorial (9 Feb., p. 525) by Thomas Eisner concerning the prospects for a Big Thicket National Park was encouraging to those of us who have been fighting for the park for many years. However, I was distressed by the pessimistic tone of the editor's note.

More people are working for Big Thicket in Texas today than ever before, and new organizations are springing up all over the state in its support. Whole high school classes have been organized for it, and a group of teachers of science in the universities of five southwestern states was formed in January to actively work to support the creation of this park.

There has been some disagreement over the size and nature of the park. Indeed, enemies of the Big Thicket have used this to try and destroy any chance at all for its creation.

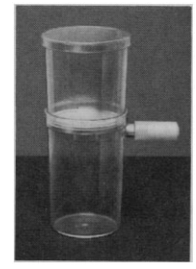
When I was in the Senate, we passed in 1970 a Big Thicket National Park Bill, inadequate though it was, based on a bill which I had been introducing and working for since 1966. Two hearings have been held on this bill in Texas, one by the Senate and one by the House, in the past 3½ years. New forces are gathering to support it.

Whether we are able to save the Big Thicket or not (and there's a real chance now that we can), at least the journal of the AAAS should be strongly on the side of justice and conservation, and not giving encouragement to the "Too late, it can't be done, it's gone, it's destroyed" opponents. No one is giving up the fight for Big Thicket here, and the more voices raised in support of the park, the sooner it will become a reality.

RALPH W. YARBOROUGH
721 Brown Building,
Austin, Texas 78701

Galápagos Graffiti

In all national parks, besides being an obvious duty of every civilized human being, it is prohibited to destroy or remove anything. This includes painting one's initials on the landscape. In Tagus Cove, in the Galápagos Islands, it has been traditional since the time of buccaneers and whalers for the crews



of visiting ships to write their names on the precipitous rock walls. Although the Galápagos Islands are now a national park, this custom regrettably has been continued. It is bad enough when proprietors of private boats do not know how to behave and unscrupulously ignore the laws of the national park. However, it is especially bitter when this type of vandalism (see above photograph) is done by the crew of the American research vessel *Searcher*, who were doing scientific research at the Galápagos National Park during the summer of 1972.

B. GRZIMEK
Zoological Society of 1858,
Alfred-Brehm-Platz,
6 Frankfurt am Main 1,
Germany

Artifact or Artefact?

The plea of W. N. Irving (not Irveng?) that artifact should be spelled with an "e" because this would have been the Latin spelling had the word been current when Latin was (Letters, 18 May, p. 696) reminds me of a sign I saw some years ago on a watering trough in West Fort Anne, New York. The sign said, "This is where Paul Revere would have watered his horse had he come this way."

ARTHUR E. NEWKIRK
Research and Development Center,
General Electric Company,
Schenectady, New York 12301

I would like to know W. N. Irving's justification for the statement that "this

[artefact] would have been the spelling in Latin had the word been current when Latin was." If the stem word had been an ordinary third-declension noun, I would not argue with him; but in fact it is one of a special class known as "i-stem" nouns, in which the persistence of the "i" is reflected in certain inflectional forms. One need only look at the actual Latin word *artifex* (and its derivative, *artificium*) to see counterexamples of his argument. I strongly urge him to persuade the Society for American Archaeology to mend the error of their ways.

GEORGE L. TRIGG
Brookhaven National Laboratory, Upton, Long Island, New York 11973

ERTS Imagery

In his second report on the Earth Resources Technology Satellite (ERTS) program (Research News, 13 Apr., p. 171), Thomas H. Maugh II refers to a study of vegetation and geology of the western Seward Peninsula, Alaska, conducted by L. Shapiro, A. E. Belon and myself. Although a paper (*1*) is in press and a detailed technical report (*2*) is available, certain aspects of this study should be made clear at this time.

1) The study was intended primarily as an exercise. We only wanted to find out how much information could be derived from the scene, one of the first good ones of Alaska, by direct visual examination, with a minimum of ground data. We had little image interpretation equipment and little ground data on vegetation available at the time. Therefore the vegetation interpretations (*1*, *2*) and the map are subject to revision.

2) The caption for figure 1 indicates that seven distinct vegetation types are shown on the map prepared from the ERTS image. Actually, only five types are shown. Senescent vegetation is not a type, but a phenological phase of certain types, and the term "fire scars" designates areas where the vegetation is in some unspecified post-fire state and has not been distinguished according to type.

3) The caption for figure 1 seems to imply that the earlier vegetation map used for comparison (*3*) has been superseded by a better map. Actually, the existing map served as ground data for the new map. The latter shows

only one additional vegetation type, grassland tundra, which is hypothetical at this point and of secondary areal importance. The new map indicates that considerable detail in the distribution of known vegetation types may be mapped more economically using ERTS imagery than by conventional methods. Also, it shows that areas of recent fires may be delineated and suggests that phenological developments and active vegetation fires may be monitored with ERTS imagery. The new map does not, however, supersede the earlier one, which covers the entire state. The line tracing which we made for comparative purposes and which is reproduced with the new map in figure 1 does not do justice to the beauty and utility of the original map.

4) The caption for figure 1 implies that the black and white image of the Seward Peninsula was used for the vegetation interpretations and mapping. Actually, a reconstituted, simulated, color-infrared, 164 by 173 millimeter print, which provided considerably more vegetation information, was used.

5) Credit for the discovery of the unmapped radial drainage pattern mentioned in the text of Maugh's report should go to my colleague and coauthor, L. Shapiro, instead of to me.

Our studies of the western Seward Peninsula scene and of numerous subsequent scenes show that, with adequate ground data, more vegetation types than are shown on existing maps may be identified; an amazing amount of information is available from some of the better ERTS scenes. Therefore, existing Alaskan vegetation maps may eventually be superseded. However, current funding levels would preclude our preparation of new and properly finished maps for more than a small portion of the state for some time to come.

J. H. ANDERSON
Institute of Arctic Biology,
University of Alaska,
Fairbanks 99701

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1. J. H. Anderson, L. Shapiro, A. E. Belon, "Vegetative and geologic mapping of the western Seward Peninsula, Alaska, based on ERTS-1 imagery," in *Proceedings of the Symposium on Significant Results Obtained from ERTS-1"* (NASA/Goddard Space Flight Center, Greenbelt, Md., in press).
2. J. H. Anderson and A. E. Belon, "A new vegetation map of the western Seward Peninsula, Alaska, based on ERTS-1 imagery," in *Interim Scientific Report on Contract NAS5-21833 to National Aeronautics and Space Administration* (No. E73-10305, National Technical Information Service, Springfield, Va., 1973).
3. L. A. Spetzman, "Alaska map E," in *Terrain Study of Alaska*, part 5, *Vegetation* (U.S. Geological Survey, Military Geology Branch, Washington, D.C., 1963).

Implementation of Technology

Amitai Etzioni's editorial "Humane technology" (9 Mar., p. 959) surely has the right title, but the content goes a bit awry. Etzioni advises us that "The task before us is to marshal more of technology to the service of *human* purposes." (Italics added.) The confusing of "human" and "humane"—which is doubtless unintentional—is curiously consonant with Etzioni's argument. Within the range of human purposes one can of course find purposes which are humane; the thrust of the editorial is that, within the inventory of man's tools, there are similarly to be found technologies which are certifiably good. Thus Etzioni lists a series of inventions—including automatic switchboards and car seat belts—all of which have undoubtedly contributed to

preserving, and perhaps enlarging, the locus of the humane in contemporary society. Such rosters notwithstanding, the argument is defective. One hunts in vain for that which is good about a technology *as a technology*. What is noble about Etzioni's exemplars is that they are employed humanely; no more. There are still crank calls, and some people still drive irresponsibly. In his attack on "cocktail party sociology," in short, Etzioni has grabbed the wrong end of the (swizzle) stick: He notes, correctly, that the popular debate has been over whether technology is evil or ethically neutral; he concludes, too hastily, that a sound case can be made for technology's being good.

Etzioni would have done better to take instead that academic path to perdition, the subtle distinction. It is useful to distinguish between the capacities of a technology and the ways in which that technology is implemented. A technology can be described as a bundle of capacities—a set of abilities or ways to do something. The principal capacity of an automobile is to transport people and goods; a secondary capacity, to emit air pollutants. Traditionally, successful technologies have catered to or created tastes related to the principal capacity, which was thus invariably perceived as desirable by its users. But one buys the entire bundle, and sometimes secondary capacities become sufficiently undesirable to challenge the bundle as a whole—as in the case of the automobile. Often, too, problems arise in the implementation, in the way the technical capacities are distributed. Public projects such as highways are often controversial, not because they are poorly designed from a technical or engineering standpoint, but because they reallocate resources, such as housing, in ways alleged to be inequitable. Even if the principal capacity of a technology is universally desired, therefore, its bundle of capacities, implemented in a particular pattern spatially, socially, and economically, may still defeat the achievement of any humane purpose.

The task before us is indeed to marshal technology to the service of humane purposes. But to assume that that must inevitably be a marshaling of *more* technology is to foreclose a choice which can be humane in a world of human and social imperatives.

K. N. LEE
Institute of Governmental Studies, University of California, Berkeley 94720

One way to assess a tool is to explore the merits of the purposes it serves. Another way, suggested by Lee, is to evaluate its *intrinsic* qualities. I suggest that technologies serve human purposes *and* have humane qualities.

1) Machines do monotonous, dirty, heavy-duty, in short, alienating work which most people would rather not do. And, there is a lot of such work that needs to be done.

2) Machines do work that is humanly necessary *and* cannot be done otherwise; here purpose and means are inseparable. For example, most medical technologies *cannot* be replaced by insight, hands, training, or whatnot.

3) Often technological means are significantly more economical *per unit of use* than other means. They are, hence, a prerequisite for coping with a wide spectrum of human needs in the face of scarcity.

Thus, when the purpose is right and the technology appropriate, and when its often undesirable side effects are either small or correctable, technological tools are often the most human *and* humane way to proceed.

AMITAI ETZIONI
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Modeling the World

The conclusion stated in Robert Boyd's abstract of his critique of Forrester's world model (11 Aug. 1972, p. 516) would be correct upon the addition of a single word. The abstract would then read: "The results of Forrester's world model are shown to be very sensitive to *absurd* changes in assumptions." Changes in Forrester's assumptions should not violate the second law of thermodynamics.

Boyd's "technological-optimist view" includes two obviously invalid assumptions. These are multiplier 2, "a fourfold increase in technology over the 1970 level decreases pollution output per unit of material standard of living to zero," and multiplier 3, "NRTM [natural resource technological multiplier] reduces the natural resources input per unit material standard of living to zero when technology quadruples." Both of these assumptions contradict the second

law of thermodynamics by ignoring the unavoidable degeneration of useful forms of energy into unrecoverable heat pollution. They also ignore the necessity of changing useful energy into waste heat in order to reverse the natural entropic change from order to disorder during the use of natural resources.

If we grant the technological-optimist his premise of an essentially inexhaustible source of energy, his indefinitely increasing technology and material standard of living (Boyd's figures 3 and 6) require an ever-increasing transformation of natural resources with increased energy input, consequent entropy, and heat pollution. According to Budyko (*1*), a small increase in the energy balance would be sufficient to melt the polar ice (0.2 to 0.6 watt/m^2, which is a few tenths of 1 percent). Although Budyko's mathematics appear to be correct, the assumption of such an increase is obviously open to question. Nevertheless, if we were to sustain the present annual rate of energy increase, enough heat would be generated to melt the polar ice in less than a century, and the technological heat input would exceed the present radiation balance in 220 years, according to McDonald (*2*).

The technological optimist would have us move toward such a climate sooner. That we will reach it is absurd, but so is the technological optimist's enthusiastic prognosis. Try as he may, the technological optimist cannot escape the necessity of a mass-energy, steady-state technology. Forrester's world model is open to question, but ultimately his conclusions are correct. Reasonable changes in Forrester's model may significantly alter the timetable, but not the destination. We need technological realism rather than technological optimism or pessimism. Qualitative progress can continue indefinitely, quantitative progress has its natural limits. The longer we wait to substitute qualitative for quantitative progress, the greater will be the threat to future generations.

PAUL E. DAMON

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University of Arizona,
Tucson 85721

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2. G. J. F. McDonald, in *Environment, Resources, Pollution and Society*, W. Murdock, Ed. (Sinauer Associates, Stamford, Conn., 1971), p. 334.

On the basis of its presumed sensitivity, Forrester's world model has been criticized by R. Boyd for not being able to discriminate between neo-Malthusian and technological-optimist policies. To summarize his position, if two slightly different versions of the same model give conflicting results, the model is not useful as a policy tool. The models in *World Dynamics* are not policy tools. However, they can still contribute significantly to a resolution of this controversy by focusing attention on what are often only implicit assumptions.

No model can decide between sets of assumptions only on the basis of its predictions. We are all equally ignorant of the future. Models can be more or less valid only in their representation of historical trends. A model cannot predict the future. However, it is worthwhile to require of a model that the assumptions it embodies be susceptible to reasoned argument and, if possible, empirical verification. Boyd's note demonstrates that Forrester's world model passes *that* test by clarifying differences in basic assumptions to the point where specific well-defined questions about the assumptions can be posed and possibly answered. Among these questions are the following:

Is technology an object, a stock which grows for all time and at no cost, or is it a social process which competes with other processes for available social capital? Further, what are the delays involved in the development and implementation of technologies?

Is there necessarily a negative relationship between technological advance and pollution generation or resource use rates? Is it possible to increase the world's stock of capital using no new resources and generating no pollution?

Do the birth rate multipliers act without delay, or is there a lag between perceptions of the social environment and their eventual effects on family structure?

A model cannot answer these questions, but it can help explore the implications of more or less credible assumptions about the answers to them.

The clarification of assumptions also contributes to the discussion about the sensitivity of the model. Sensitivity is intuitively expressed by the idea that small perturbations in the model lead to small or large changes in model behavior. The addition of a new level whose purpose is to remove two of the pressures (resource depletion and pollution) operating in the original model seems to violate the assumption of small perturbations. Indeed, Boyd claims that pollution generation and resource usage rates could go to zero at a finite level of technology. If resource use and pollution generation rates are decreased (to model technological advances) but remain finite, model behavior is not seriously affected [see figures 5-8 and 6-1 in *World Dynamics* (*1*)].

Boyd's remedy, disaggregation and increased complexity of structure, may increase academic confidence in the model. However, there is a trade-off with comprehensibility and no guarantee that the model will be less sensitive to alternative sets of assumptions. Nor is there a guarantee that there will be any fundamental change in the behavior modes of the model.

R. JOEL RAHN
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Dartmouth College,
Hanover, New Hampshire 03755

Reference

1. J. W. Forrester, *World Dynamics* (Wright-Allen, Cambridge, Mass., 1971), pp. 105, 114.

In the second letter, R. J. Rahn summarizes my paper inaccurately; much of his criticism seems to stem from this misunderstanding. It was not my intent to show that Forrester's model was sensitive to small perturbations; the word "sensitivity" has a specialized use in engineering, and my use of it was unfortunate. My argument may be more correctly summarized in the following way:

In the controversy about the world population problem there are two major positions, that of the neo-Malthusian and that of the technological optimist; each has a sizable portion of the intellectual community among its adherents. With neo-Malthusian assumptions, the world model yields results which are qualitatively the same as those the neo-Malthusians produce without the use of computers; with assumptions of a technological optimist, the model yields a technological optimist's results. Thus in the absence of any additional empirical input, the model does very little to help us decide between the two positions.

Rahn quite rightly points out that models have very useful instructional and heuristic properties. It was not

my intention to imply that Forrester's model was not useful for clarifying ideas (particularly to those with technical training) or in generating new research questions. A few caveats are in order, however. If there is uncertainty about a large number of the interactions incorporated in the model, the number of different, plausible simulations will become bewilderingly large. Disaggregation could help by making the variables less operationally vague; but, as Rahn points out, this entails its own costs. I am prepared to accept the possibility that there are some systems for which mathematical modeling is not especially fruitful and that the world system might be one of these, but only time will tell. The possible benefits certainly justify the attempt.

There seem to me to be two ways to read P. E. Damon's critique. One could regard it as an attack on the technological optimist's position. If this is the case, he ought to argue with them and not me. On the other hand, the point may be that I have misrepresented the mainstream of the technological optimist thought—specifically, that there are few who would assert that natural resource use or pollution generation can be reduced to zero. I have decided that this is at least partially true. Many technological optimists argue that the quantity of resources has actually increased during this century. For example, was uranium a resource 50 years ago? This view could be represented in Forrester's model only by a negative rate of use. Thus the zero rate suggested in my report is conservative. On the other hand, it probably is unfair to reduce pollution output to zero. However, I have done runs with a maximum reduction from present levels by a factor of .01, and the results were identical to those of similar runs with the multiplier used in my report.

Damon says, "Forrester's world model is open to question, but ultimately his conclusions are correct." I believe our present ignorance of the nature of the world system makes this more a statement of prejudice than of scientific fact, and while I share Damon's prejudice, I am unwilling to have it sanctified by the computer.

ROBERT BOYD
Department of Mechanical Engineering, University of California, Davis 95616

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22 June 1973, Volume 180, Number 4092 **SCIENCE**

The Two Worlds of Higher Education

Under pressure of financial difficulties, many private universities are undergoing amputations of this or that limb. St. Louis University has abolished its engineering and dental schools. The University of Pennsylvania has recently published a report telling three of its component schools that, unless they can balance their budgets within 3 years, they may face extinction. New York University, one of the largest of all private institutions, has had to sell its Bronx campus to the public system of New York City.

Has this happened because of any rational, explicit, and conscious national decision that the private sector in higher education should shrink or be phased out? To ask the question is to answer it. Quite the contrary, it has been happening amidst a cloud of amiable rhetoric about the virtues of pluralism and diversity and the value of a healthy private sector.

Yet without a conscious decision to preserve and nourish the private sector, the phase-out will eventually take place. Without such a decision, private institutions will disappear one by one or become subunits of state systems. If it reaches the point where Harvard, with its $1.25-billion endowment, and a handful of others are all that remain, it is doubtful that even they can be wholly immune. One thinks of Oxford and Cambridge, ancient and laden with traditions of independence, but now relying heavily upon the state and subject to rationalization as part of the general state-supported system.

Certainly those of us involved with private institutions would not argue that the private sector is of higher quality across the board than the public. The great state universities of this country are themselves unique phenomena of tremendous importance to the continuing vitality of our society. What we should urge is support for a reasonably competitive academic structure. We should not expect the government to supply all of our needs, for that would mean the end of our independence. Where government, at whatever level, does help, it should do so in ways that preserve our individuality and foster free choice.

I hope that the states will act to diminish—but not to eliminate—the steadily growing gap between what it costs to attend a public institution and what it costs to attend a private college or university. That gap was, on the average, about $500 in 1957; next year it will be $1800, with no sign of lessening. The process cannot continue indefinitely without some counter-effort on behalf of the private sector, if the private sector is to survive.

In all of this, I'm not suggesting that anyone has a monopoly on wisdom, much less that either private or public institutions should or can live by cutting each other's throats. We at Stanford tend to think that God and the citizenry of California will help those who help themselves. We're raising money by a time-tested appeal to the philanthropic spirit, which, to judge from our recent experience, is far from dead in America. We're cutting our costs, reexamining our programs, and working to dodge those twin evils—doing things because you've always done them that way, and doing things *merely* because you've *never* done them that way. We're convinced that higher education need not be turned into a vast machine or a soulless bureaucracy and that the surest way to prevent this from happening is to encourage healthy competition between the public and private sectors.—RICHARD W. LYMAN, *President, Stanford University, Stanford, California 94305*

PRODUCTS and MATERIALS

Statistics Calculator

The model 9805A Stat Calculator system can calculate histograms, mean, standard deviation, *t* for paired and unpaired data, and correlation coefficients and it can compute straight line fit or parabolic curve fit. The standard four arithmetic functions are included, as are calculation of percentage, 1/x, x/12, natural logarithm of x, logarithm of x to base 10, e^x, raise a number to a power, and grand total accumulation. The device is compatible with plotters and has a built-in printer. It is also available with a 10-character solid state display. The above-named calculations are all performed with a single keystroke. Options also include the calculation of power curves, exponential curves, and logarithmic curves by least squares and computation of one-way analysis of variance. Hewlett-Packard Company. Circle No. 128 on Readers' Service Card.

Automatic Nuclear Counting

The Medotopes ratiometer is a compact single-channel analyzer that may be used to detect the primary scintillation peak of such radionuclides as iodine-125, cobalt-57, chromium-51, iodine-131, cobalt-60, iron-59, technetium-99m, cesium-137, and molybdenum-99. Thus, the ratiometer is useful in clinical and research applications, such as determination of T-3 and T-4 thyroid function, latent iron-binding capacity, the Schilling test, angiotensin 1 radioimmunoassay, and others. Background radiation is detected and automatically compensated. The operator inserts a standard solution in the well and the elapsed time required to count 10,000 disintegrations is displayed to the nearest tenth of a second. The unknown is tested and the ratio of the elapsed time for 10,000 disintegrations is compared to that of the standard and the result is displayed as a percentage. Operation of the device is easily learned. E. R. Squibb & Sons. Circle No. 129 on Readers' Service Card.

Argon Ion Milling

Argon ions are accelerated at 5 kilovolts with a current density of 1 milliampere per square centimeter by the MIM IV/TLA 5.5 ion milling device (Fig. 1). The apparatus is useful in defining patterns in semiconductor technology, cleaning surfaces, fabricating microcircuits, quality control, and a variety of other applications, including polishing laser optics. The components of the system include the vacuum system, vacuum instrumentation, power supplies, process controls, gas supply system, work chamber, and an ion gun 5.5 centimeters in diameter. The ion source is an electron emission magnetically deflected plasma discharge coupled with a system to extract and focus the ions. Specimens or materials to be milled may be up to 2 inches in diameter and the angle of incidence of the ion beam is variable from 0 to 90 degrees during milling. Loading is accomplished easily through a port and a retractable stage. Milling can be observed through top and front ports. Technics Incorporated. Circle No. 130 on Readers' Service Card.

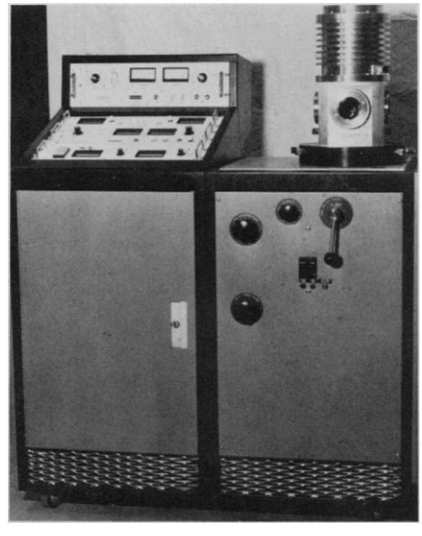

Fig. 1. The Micro Ion Mill model IV from Technics, Inc. provides accelerated ions at an angle of incidence that depends upon the material to be removed from a surface and the rate of removal and surface finish desired. With an incident beam angle of 60 to 75 degrees from normal, a pressure of 3×10^{-4} torr, a voltage of 6 kilovolts, and current density of 1 milliampere per square centimeter, an area 1 centimeter in diameter of quartz was milled at a rate of micra per hour and when the current density was raised t 5 milliamperes per square centimeter, rates as high as 125 micra per hour wer achieved milling a gallium phosphide sur face.

Chemicals for Electrophoresis

Chemicals, including buffers, stains, and incubation mixtures, are available for acrylamide, agarose, and starch gel electrophoresis. The substances are packaged in specified amounts with instructions for preparation on the packet. Materials are available for routine laboratory procedures and they may be adapted to specialized requirements. E-C Apparatus Corporation. Circle No. 132 on Readers' Service Card.

Literature

Parathyroid Hormone (*Bovine*) is the subject of a data sheet. The substance is a biologically active synthetic peptide that substitutes for the natural material. Beckman Instruments. Circle No. 133 on Readers' Service Card.

Gas-Chrom Newsletter is an 8-page bulletin featuring articles about products and laboratory techniques. The March/April issue has an article on electron capture detection, among others. Applied Science Laboratories. Circle No. 131 on Readers' Service Card.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card (see pages 1234A and 1298C and placing it in the mailbox. Postage is free.—RICHARD G. SOMMER

BOOKS RECEIVED

(Continued from page 1271)

sak, New York, 1973. x, 192 pp., illus. $19.75.

Dictionary of the Environmental Sciences. Robert W. Durrenberger. National Press, Palo Alto, Calif., 1973. iv, 282 pp., illus. Cloth, $7.95; paper, $4.95.

Differential Equations. And Related Topics for Science and Engineering. Robert W. Hunt. Brooks/Cole (Wadsworth), Monterey, Calif., 1973. xii, 286 pp., illus. $10.95. Contemporary Undergraduate Mathematics Series.

Differential Thermal Analysis. Vol. 2, Applications. R. C. Mackenzie, Ed. Academic Press, New York, 1972. xvi, 608 pp., illus. $35.

Diffraction of Elastic Waves and Dynamic Stress Concentrations. Yih-Hsing Pao and Chow-Chow Mow. Crane Russak, New York, and Hilger, London, 1973. x, 694 pp., illus. $18.

Dilemmas of Social Reform. Poverty and Community Action in the United States. Peter Marris and Martin Rein. Aldine, Chicago, ed. 2, 1973. xii, 310 pp. Cloth, $8.50; paper, $3.50.

Dynamic Ecology. Boyd D. Collier, George W. Cox, Albert W. Johnson, and Philip C. Miller. Prentice-Hall, Englewood Cliffs, N.J., 1973. xii, 564 pp., illus. $11.95. Prentice-Hall Biological Science Series.

The Earth and the Environment. Halsey W. Miller, Ronald E. Yarbrough, Dorothy Jean Gore, and Doyle E. Saddler. Stipes, Champaign, Ill., 1973. iv, 264 pp., illus. Spiral bound, $6.40.

Evaluation of Environmental Intangibles. Nicholas H. Coomber and Asit K. Biswas. Genera, Bronxville, N.Y., ed. 2, 1973. vi, 78 pp., illus. Paper, $3.95.

Experimental Control of Mitosis: II. Papers by J. J. McCormick and 19 others. MSS Information Corporation, New York, 1972. 178 pp., illus. $15.

The Fossil Origins of Man. Halsey W. Miller. Stipes, Champaign, Ill., ed. 2, 1973. iv, 188 pp., illus. Paper, $6.90.

Foundations of Experimental Psychology. James W. Kalat, Ed. MSS Information Corporation, New York, 1972. 494 pp., illus. Paper, $12.50.

Functional Anatomy of Marine Mammals. Vol. 1. R. J. Harrison, Ed. Academic Press, New York, 1972. xviii, 452 pp., illus. $21.

Genetics and Education. Arthur R. Jensen. Harper and Row, New York, 1973. vi, 378 pp., illus. $10.

Geologic Reference Sources. A Subject and Regional Bibliography of Publications and Maps in Geological Sciences. Dedrick C. Ward and Marjorie W. Wheeler. With a section on geologic maps by Mark W. Pangborn, Jr. Scarecrow, Metuchen, N.J., 1972. 454 pp. $12.50.

Gesture, Race and Culture. A Tentative Study of Some of the Spatio-Temporal and "Linguistic" Aspects of the Gestural Behavior of Eastern Jews and Southern Italians in New York City. David Efron. Sketches by Stuyvesant Van Veen. Mouton, The Hague, ed. 2, 1972. 226 pp. f70. Approaches to Semiotics, 9.

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Human Judgment and Social Interaction. Leon Rappoport and David A. Summers, Eds. Holt, Rinehart and Winston, New York, 1973. xii, 404 pp., illus. $8.95.

The Image of the Future. Fred Polak. Translated and abridged by Elise Boulding. Elsevier, Amsterdam, and Jossey-Bass, San Francisco, 1973. xii, 320 pp. $9.75. Jossey-Bass/Elsevier International Series.

Immigrants from India in Israel. Planned Change in an Administered Community. Gilbert Kushner. University of Arizona Press, Tucson, 1973. xvi, 150 pp. Paper, $6.95.

In Search of a Response. Leida Berg and Harold Steinberg. Tiresias Press, New York, 1973. xiii, 618 pp. $20.

Inorganic Rings and Cages. Fred Armitage. Arnold, London, and Crane Russak, New York, 1973. xii, 388 pp., illus. $37.50.

An Introduction to Chinese Civilization. John Meskill and J. Mason Gentzler, Eds. Columbia University Press, New York, 1973. xii, 700 pp., illus. $17.50.

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Introduction to Lie Algebras and Representation Theory. J. E. Humphreys. Springer-Verlag, New York, 1972. xiv, 170 pp., illus. Paper, $10.80. Graduate Texts in Mathematics 9.

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poration, New York, 1973. Vol. 1, papers by William Neidermeier and ten others. 208 pp., illus. Vol. 2, papers by Joel M. Goodman and 11 others. 174 pp., illus. Each vol., $15.

Progress in Biophysics and Molecular Biology. Vol. 26. J. A. V. Butler and D. Noble, Eds. Pergamon, New York, 1973. viii, 478 pp., illus. $39.

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