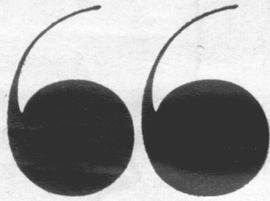


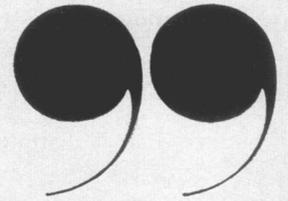
If you do care  
about money—  
the RPC-4000 beats  
all other computers  
in its class



If you don't care  
about money—  
the RPC-4000 beats  
all other computers  
in its class



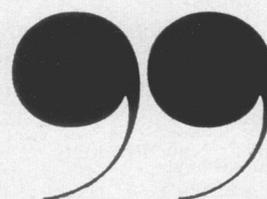
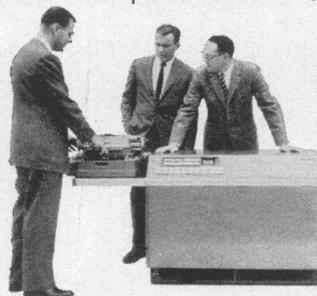
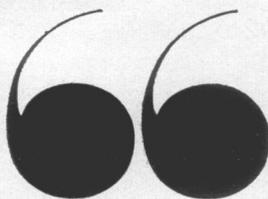
THE COLD COMPETITIVE  
FACTS ARE EMBARRASSING—  
TO THE COMPETITION.



8008 word memory—over 4000 more than any other computer in its class. Computing speeds of up to 230,000 operations per minute. Desk-size, and completely transistorized. 30,000 characters per minute input—18,000 characters per minute output. □ Easiest operation and programming. Its automatic routines let you learn to program the RPC-4000 in hours instead of days. (More than 3000 students were taught programming in less than one day with PINT, an interpretive routine developed especially for the RPC-4000 by Purdue University. A film of this training will be shown on request). You'll never have to be dependent upon programming specialists. Even non-technical personnel can master it. □ All of this adds up to the largest memory, greatest problem solving capacity and flexibility in the low- or medium-priced field. A desk-size computer—but with room-size computer capacity. □ Cost? The RPC-4000 talks the way money does. The least expensive computer with equal capacity costs twice as much. Then there's the chunk of cash you may save on programming—thanks to the RPC-4000 ready-prepared Program Library—the most extensive in its class.

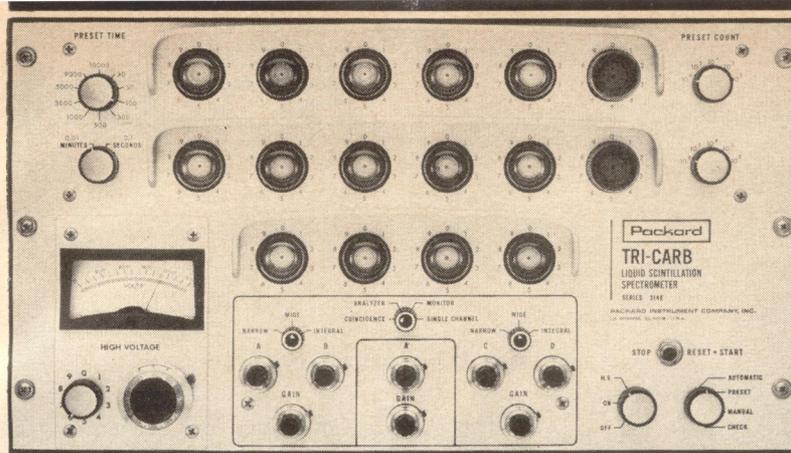


Where can you get comparable computer value per dollar? Only one place—General Precision. The LGP-30—little brother (or sister) to the RPC-4000 is the most powerful and has the biggest memory of any complete computer system in its class. And it rents at the astonishing low cost of \$1100 per month. For more information about rental or purchase, write Commercial Computer Division.



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## Scientists in the News

The following have been appointed to the Air Conservation Commission of the AAAS Committee on Science in the Promotion of Human Welfare (see editorial, this issue):

**James P. Dixon**, chairman; president of Antioch College.

**John W. Bodine**; president and executive director, Penjerdel (Pennsylvania–New Jersey–Delaware Metropolitan Project, Inc.).

**Herbert R. Domke**; director, Allegheny County (Pa.) Health Department.

**François N. Frenkiel**; applied mathematics Laboratory, David Taylor Model Basin.

**M. Mason Gaffney**; professor of economics, University of Wisconsin—Milwaukee.

**John R. Goldsmith**; head, Air Pollution Medical Studies Unit, California Department of Public Health.

**Arie J. Haagen-Smit**; professor of biology, California Institute of Technology.

**Howard Higman**; professor of sociology, University of Colorado.

**James P. Lodge, Jr.**; staff chemist, National Center for Atmospheric Research, Boulder, Colo.

**Martin Meyerson**; director, Joint Center for Urban Studies, Massachusetts Institute of Technology and Harvard University, and professor of city planning, Harvard.

**Norton Nelson**; director, Institute of Industrial Medicine, New York University Medical Center.

**Frits W. Went**; director, Missouri Botanical Garden.

**Calvin A. Buehler**, head of the department of chemistry at the University of Tennessee, is relinquishing his administrative duties in September to devote full time to teaching and research. He will be succeeded by **David A. Shirley**, a member of the department.

Lt. Gen. **Arthur G. Trudeau**, retired chief of research and development for the Army, has been appointed president of Gulf Research and Development Company, Pittsburgh, Pa. He succeeds **Blaine B. Wescott**, who retired.

**Arthur C. Clarke**, British writer of science fiction and president of the Ceylon Astronomical Association, is the 10th winner of the Kalinga prize for the popularization of science. The £1000 prize is awarded annually by UNESCO-appointed judges.

**Bernard Epstein**, physicist and former test engineer with Electrosolids Corporation, has joined Endevco Corporation, Pasadena, Calif., as a technical service engineer.

**Roy M. Acheson**, senior lecturer in social and preventive medicine at Oxford University and Trinity College, Dublin, has been appointed associate professor of epidemiology and medicine at Yale's School of Medicine.

**J. F. A. Sprent**, of the University of Queensland Veterinary School, Brisbane, Australia, has received the American Society of Parasitologists' \$1000 Henry Baldwin Ward award for 1962.

**Laurence M. Gould**, retiring president of Carleton College, Northfield, Minn., will join the University of Arizona faculty as professor of geology in February.

**S. Fred Singer**, professor of physics at the University of Maryland, has been granted leave to serve as director of meteorological satellite activities for the U.S. Weather Bureau.

Col. **Clark L. Hosmer**, former commander of the technical school at Lackland Air Force Base, Tex., has accepted an associate professorship at Florida State University School of Business.

At National Aeronautics and Space Administration:

**Richard B. Morrison**, of the University of Michigan's department of aeronautics engineering, has been named director of launch vehicle and propulsion programs in the Office of Space Sciences.

**Eugene B. Konecci**, of Douglas Aircraft Company's missiles and space systems division, has been appointed to the newly created position of director of biotechnology and human research in the Office of Advanced Research and Technology.

At the Johns Hopkins Medical Institutions:

**Leighton E. Cluff**, professor of medicine, will be visiting professor of medicine at the University of Vermont during August.

**Milton T. Edgerton**, associate professor of plastic surgery, is a visiting professor at the Christian Medical College, Vellore, South India, until September.

**John D. Porterfield**, deputy surgeon general of the U.S. Public Health Service, has retired to become state-wide coordinator of health and medical affairs of the University of California. He is succeeded by **David E. Price**, deputy director of the National Institutes of Health.

Col. **George M. Leiby**, retired special assistant to the Air Force Surgeon General, has been appointed chief public health adviser for the Brazil mission of the Agency for International Development.

Recent awards of the American Society for Engineering Education:

**Harold L. Hazen**, dean of the graduate school at Massachusetts Institute of Technology, the Lamme gold medal for "distinguished achievements in engineering teaching, research, and administration."

**Paul M. Naghdi**, professor of engineering science at the University of California, the \$1000 George Westinghouse Award for "outstanding contributions to teaching by a young faculty member."

**Roy Bainer**, associate dean of the College of Engineering, University of California, the Vincent Bendix Award for "outstanding research contributions by an engineering educator."

**Michel Baudart**, professor of chemical engineering at the University of California, Berkeley, the \$1000 Curtis McGraw Research Award for "outstanding achievement by a young engineering teacher."

## Recent Deaths

**Harry L. Andrews**; former faculty member of Florida State University's botany department; 24 Mar.

**Louis R. Bryant**, 66; professor of horticulture at Washington State University; 22 Jan.

**Marcus R. Caro**, 59; consulting dermatologist at Cook County (Chicago) Hospital and former head of the department of dermatology at University of Illinois; 17 May.

**Clarence W. Ham**, 81; emeritus professor of machine design at the University of Illinois; 20 Apr.

**Julia B. Paton**, 87; physiologist and retired research biochemist with National Drug Company; 5 June.

**Edison Pettit**, 73; astronomer at Mount Wilson Observatory, Pasadena, Calif.; 6 May.

of the Sahara, under conditions which make it not entirely certain that I will get home alive; and so I feel more keenly than I used to a faint but poignant hint of what Barth felt during most of his 5 years in central Africa. Kirk-Greene can make even the most sedentary chair-bound reader feel it too, for he is as outstanding a writer as he is a scholar. From either point of view *Barth's Travels in Nigeria* can be described only as a masterpiece.

LLOYD CABOT BRIGGS  
Peabody Museum, Harvard University

## On Teaching Methods

**Elements of Chemistry.** Raymond B. Brownlee, Robert W. Fuller, William J. Hancock, Michael D. Sohon, and Jesse E. Whitsit. Revised by Paul J. Boylan. Allyn and Bacon, Boston, ed. 2, 1962. viii + 696 pp. Illus. Plates. \$5.68.

This book has obviously been very carefully planned in a sincere effort to give what, in the judgment of Paul Boylan who revised it, is a useful tool for learning and teaching high school chemistry. A pattern of development is set in the first chapter and is followed with practically no variations to the end of the book. First there is a study outline which, through the medium of 5 to 16 specific questions, calls attention to specific topics that are covered in the chapter. Then come well-identified discussions of specific topics. Distributed among the discussions are two to five sets of "test yourself" questions, which are in italics and thus are easily identified. Following the discussions and questions is a summary, then a list of the key words that have been encountered in the chapter, and then a group of questions and, in some chapters, numerical problems. There follows a list of student activities—that is, special projects. Last is a list of references for further reading.

Although such a well-defined pattern of development, from the first chapter to the last may, in the judgment of many teachers, represent too much rigidity and regimentation it does have merit; there is practically no question, by either student or teacher, as to what is to be learned and taught.

It is with respect to the order in which certain topics are presented, the amount of material covered, and the

relative emphasis on facts and on reasons behind these facts that I take issue with the method used in the revision.

The modern theory of the structure of the atom is based on experimental facts. So is the periodic table. A first exposure to chemistry, and for most students high school chemistry is their first exposure, should emphasize this. Accordingly, treatment of the structure of the atom and of the periodic classification of the elements should not be presented until the student knows some of the facts, reasoning, and thinking on which these concepts are based. Once the foundation has been properly laid, then and then only, is he prepared to use these concepts to correlate and explain new facts and to arrive at logical explanations and conclusions.

It seems to me that the book is too long and that it recites too much factual information to be most useful as a high school textbook. The statement in the preface that "the main concern of the text is with modern chemical theory and principles" is not borne out. Facts are important and must be stressed, but they should be examined in a perspective of reasons and principles.

C. H. SORUM

Department of Chemistry,  
University of Wisconsin

## Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, but to the publisher or agency sponsoring the publication.)

**Brazil, University of Minas Gerais.** *Publicações de Anatomia*, vol. 4. Liberato J. A. Di Dio, Ed. The University, Minas Gerais, Brazil, 1960. 14 papers, published during 1958, by Di Dio and others, are reprinted.

**British Museum (Natural History).** *Fossil Amphibians and Reptiles*. W. E. Swinton (127 pp., ed. 3. 5s.). *A Short Guide to the Exhibition Galleries of the Natural History Museum* (39 pp., ed. 9). *Bulletin: Zoology*, vol. 8, No. 6, pp. 285–312: "On a collection of freshwater gastropod Mollusca from the Ethiopian highlands," C. A. Wright and D. S. Brown (12s. 6d.). The Museum, London, 1962.

**Chicago Natural History Museum.** *Fiel-diana: Anthropology*, vol. 36, No. 11, pp. 243–275: "The Red Ocher culture of the Upper Great Lakes and adjacent areas," Robert E. Ritzenthaler and George I. Quimby (\$1); *Geology*, vol. 14, No. 6, pp. 99–104: "A reconstruction of the shield of the Arthrodire, *Bryantolepis brachycephalus* (Bryant)," Robert H. Denison (\$0.25); *Zoology*, vol. 44, No. 10, pp. 67–68: "A new species of land snail from Bolivia," Fritz Haas (\$0.15). The Museum, Chicago, 1962.

**Smithsonian Institution.** *Miscellaneous Collections*, vol. 144, No. 2: "Dimensional relationships for flying animals," Crawford H. Greenewalt. Smithsonian Institution, Washington, D.C., 1962. 46 pp. Plates.

**Union of International Associations.** Publ. No. 173, "Annual international congress calendar, 1962" (96 pp., \$4); a list of the scheduled international meeting for the years 1962 to 1967 inclusive. Publ. No. 174, "International initiales" (44 pp., \$1); provides full name, whether in English or French, of some 1800 sets of initials now used by international organizations, both governmental and nongovernmental. Publ. No. 175, "The first ten years of international associations," compiled by E. S. Tew (40 pp., \$1); an analytical index of articles and surveys published in vols. 1–10 of U.I.A.'s magazine, entitled during 1949–50 *Monthly Review of the Union of International Associations*, during 1951–53 *NGO Bulletin*, and 1954 to date, *International Associations*. U.I.A., Palais d'Égmont, Brussels 1, Belgium.

**U.S. Joint Committee on Atomic Energy.** Radiation protection criteria and standards. *Index to Hearings and Selected Materials of May 1960*. The Committee, Washington, D.C., 1961 (order from Superintendent of Documents, GPO, Washington, D.C.). 97 pp. \$0.30.

**U.S. Office of Education.** OE-13017, "Literacy and basic elementary education for adults," Betty Arnett and Edward Warner Brice (126 pp., \$0.55). Superintendent of Documents, GPO, Washington, D.C., 1961. A selected annotated bibliography, including lists of educational information sources.

**U.S. Public Health Service. National Institutes of Health.** Publication No. 897: "Highlights of research progress in general medical sciences, 1961." Superintendent of Documents, GPO, Washington, D.C., 1962. 61 pp. \$0.25. A statement concerning items of interest on research studies and research training programs supported by the division of general medical sciences; prepared as background material for submission at the fiscal 1962 Congressional hearings on appropriations.

**University of Wisconsin.** *Geophysical and Polar Research Report*, No. 1: "Geophysical studies in Victoria Land, Antarctica," John G. Weihaupt (123 pp., 1961); No. 2: "Reconnaissance residual and regional magnetic maps of the Arctic Ocean basin," (preliminary report) Ned A. Ostenson, Richard J. Wold, G. P. Woollard (4 pp., maps, 1962); No. 62–3: "Summary and discussion of the geophysical and glaciological work in the Filchner Ice Shelf area of Antarctica," John C. Behrendt (65 pp., 1962); No. 62–2: "Evaluation study of airborne gravimeter operational test," Richard Coons, William Strange, George P. Woollard (66 pp., 1962); *Technical Report*, No. 62–1: "Evaluation study of airborne gravimeter operational test," William Strange, Richard Coons, George P. Woollard (40 pp., 1962). Geophysics and Polar Research Center, Madison, Wis.

**Voluntary Health and Welfare Agencies in the United States.** An exploratory study by an ad hoc citizens committee. Schoolmasters' Press, New York, 1961. 88 pp. \$1.

## Kodak reports on:

modulation transfer curves for film . . .

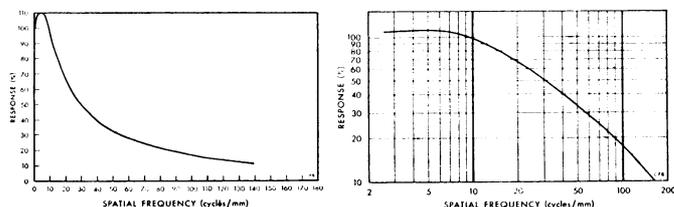
magic lanterns, old and new . . . phenolphthalein reborn

### No snow job

Flip through one of those magazines that point high on the taste-making hierarchy. Look at the photographs in the ads. Very potent. Here dangles the carrot that powers the economic machine. Here, in an extremely important function of photography in today's world, a subjective attitude by the viewer is intended.

At the same time and with no less skill, success, or importance for today's world, photography is being wrung as dry as possible of subjectivity.

Hopped up on information theory, habituated to the tube-handbook way of life, harried by urgent need to watch some vane flutter fifty miles high in the sky, heavy-footed engineers are trampling on the nuances where the grapes of art are stored. Curves they want, not adjectives. Curves they shall have. Like these for KODAK ROYAL-X Pan Recording Film:



53 sets of them. They have just been published in "Modulation Transfer Data for KODAK Films," a pamphlet obtainable free from Eastman Kodak Company, Special Sensitized Products Division, Rochester 4, N. Y.

This is not a snow job. We have thought it worthwhile to go to a great deal of trouble to obtain these data from actual measurements on actual film. The resolving power, which was never very objective, is now merely a point on the curve.

Much work still lies ahead. Publication of these modulation transfer curves for KODAK films may hasten the advent of modulation transfer curves for lenses. In the meantime, it is possible to work backward by measuring the over-all modulation transfer function and "dividing" it by the function the pamphlet gives for the film. As a simpler expedient to aid in distinguishing the feasible from the unfeasible, one can use the modulation transfer function for a perfect (i.e. diffraction-limited) lens. It's included with the pamphlet.

A review paper on all this entitled "Methods of Appraising Photographic Systems" has been much in demand by scientists, perhaps troubled as to the validity of their experimental assumptions. If you ask for the curves but not for the review paper, we shall assume that you already have it or are too well informed to need it.

### 1917 must have been a great year

The honest old lantern slide plate has gone into hiding under an alias and can be located only by asking a photo supply dealer for KODAK Projector Slide Plates. It had sinned by defying the modern attitude. You can appreciate our embarrassment.

The emulsion we put on this product has undergone no significant improvement since 1917. Not that we haven't tried. Lord, how we've tried! Yet every "improved" lantern-slide emulsion we come up with shows some characteristics that we are afraid the customers wouldn't like as well as they like the unimproved vintage of 1917. Considering the combined scientific might of the laborers we employ in the vineyard and

considering that the customers are also largely scientists and engineers professionally dedicated to progress, the situation strikes us as a dirty shame.

The customers use the product either to present their latest discoveries to colleagues at scientific meetings by means of a device that our forefathers called a magic lantern—hence "lantern slides"—or they use them in an even more magical device called an electron microscope. How we hunger to advertise that we deserve some credit for the light this instrument has shed on the molecular machinery of the cell!

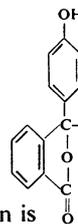


Keep watching. We do not propose to give up our attempts to earn such credit.

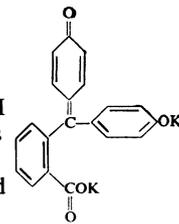
Meanwhile, to make amends for allowing various committees to talk us into replacing the well understood designation "lantern slide," by the vague and ambiguous word combination "projector slide," we now put a very thin but effective anti-abrasion coating of plain gelatin over the good old emulsion.

### Plain and salted

You need not admit that you have forgotten or never knew that the structural formula of phenolphthalein is



which, with a drop or two of KOH added, turns its famous magenta and becomes



With the carboxyl esterified instead of salted and the other two rings brominated, you have *Tetrabromophenolphthalein Ethyl Ester Monopotassium Salt* (EASTMAN 7083).

We also offer the free indicator acid, *Tetrabromophenolphthalein Ethyl Ester* (EASTMAN 6810). It is an indicator for non-aqueous titrations just as the potassium salt is an indicator for aqueous media. EASTMAN 6810 exhibits different colors with different bases. Maybe that's nice and maybe it isn't. It has another property which you may find more interesting. If brought into contact with native proteins, a blue color—apparently an adsorption compound—appears. This blue color, unlike the blue of the alkali salts of this indicator, does not turn yellow with application of dilute acetic acid. The same effect is obtained with concentrated alkaloids of high molecular weight but not with mere amino acids, di- and tripeptides, or peptones. This is the basis of the spot test for proteins to be found in Feigl's *Spot Tests*, Volume II, p. 293 (Elsevier, 1954).

The procedure given there is based on the potassium salt because, says the book, the ester is not usually available. If that's all that outdates the book, it's a mighty good book indeed.

Actually we have found it a little harder to make pure EASTMAN 7083 than pure EASTMAN 6810 but both, along with 3900 other EASTMAN Organic Chemicals, are available from Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company).

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science

**what's in the bottle?** Some batch-to-batch variability is inevitable in preparing rare biochemical intermediates. Now, so that you know exactly what you are using, SCHWARZ BIORESEARCH provides pertinent analytical data\* describing "what's in the bottle" shipped to you. Our new catalog delineates SCHWARZ quality standards—which are based on the National Research Council's criteria for biochemicals. Have you received your copy?

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Product Adenosine 5'-Monophosphate · H<sub>2</sub>O  
(muscle adenylic acid) Lot AMP6201

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Chemical Analysis		Paper Chromatography			
%N	<u>19.16</u>	Solvent	Amount	R <sub>F</sub>	Other Components
%P	<u>8.48</u>	<u>F</u>	<u>200 μ</u>	<u>.65</u>	% R <sub>F</sub> Chem
N/P	<u>2.25</u>	<u>E</u>	<u>200 μ</u>	<u>.61</u>	<u>none</u> — —
%H <sub>2</sub> O	<u>4.9</u>				<u>none</u> — —
H'vy Met.	<u>none</u>				

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UV Absorption				Miscellaneous	
Ratios at pH	250/260	280/260	290/260	Form	<u>C<sub>10</sub>H<sub>14</sub>O<sub>9</sub>N<sub>5</sub>P · 1H<sub>2</sub>O</u>
<u>7</u>	<u>.78</u>	<u>.16</u>	<u>0</u>	Mol. Wt.	<u>365.2</u>

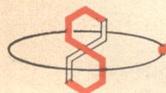
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Clarity test	<u>5</u> % Soln. at pH <u>5.0</u>	% Purity of Product	<u>100</u>
<u>clear</u> at <u>25</u> °C		from <u>nitrogen</u> anal.	
[α] <sub>D</sub> <sup>25</sup>		Analyzed by	<u>DB</u>
Conc. =		Approved by	<u>JDL</u>
In			
Element			
%			

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**Note:** All analyses on 'as is' basis

\*Sample Product Analysis Report for nucleic acid derivatives.



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