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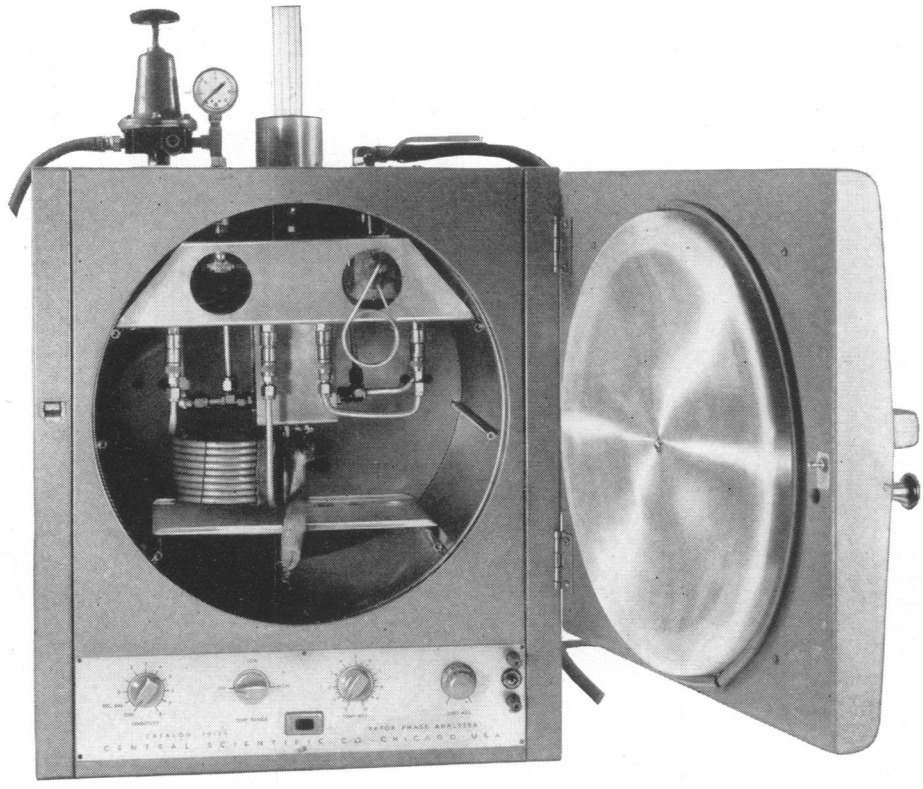

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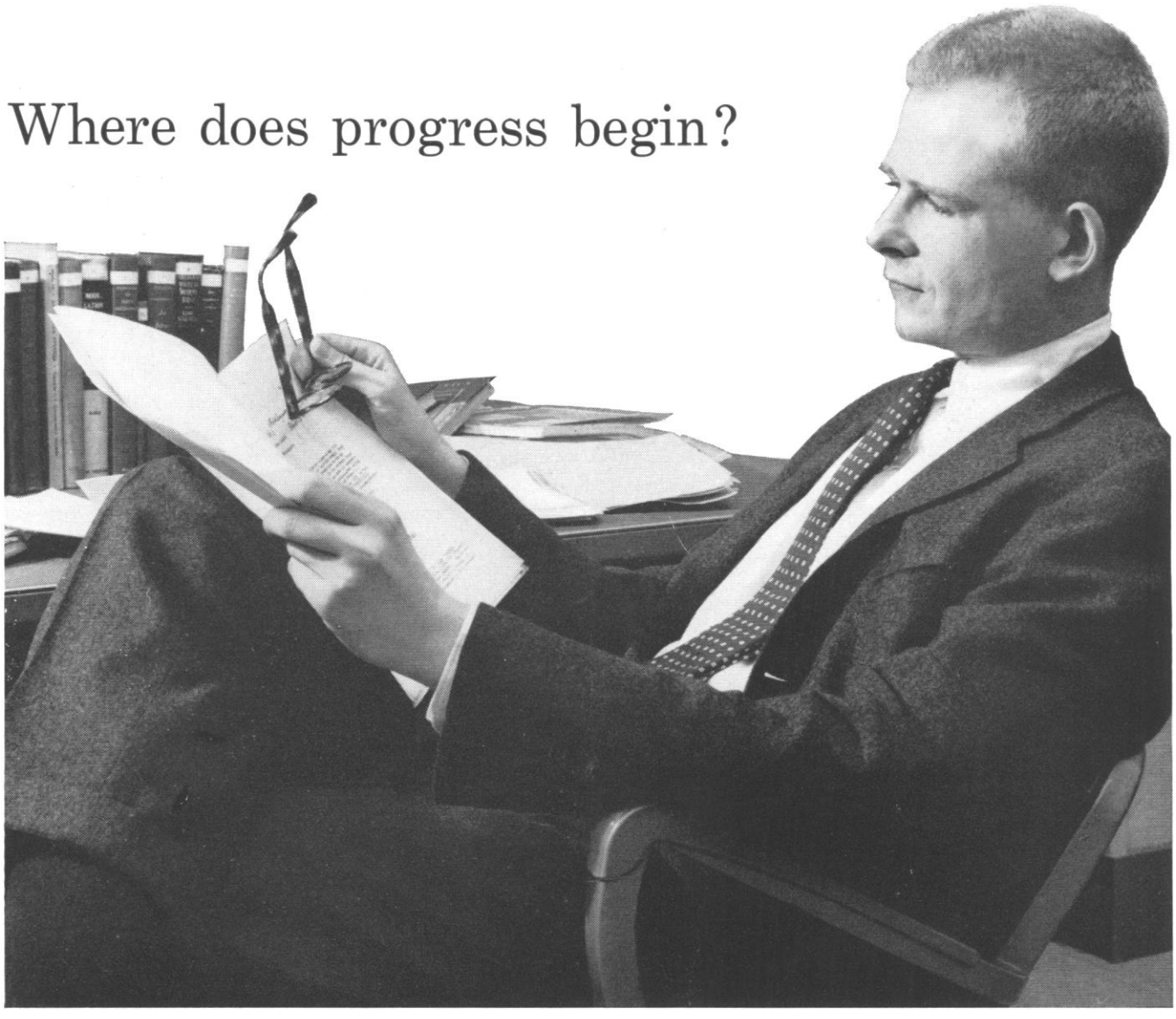
Where does progress begin?



Kendall Preston Jr., S.M. in engineering from Harvard University...
graduate of the Laboratories' Communications Development Training Program.

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synthesis of chondroitin sulfate"; H. F. DeLuca, "Vitamin D and citrate metabolism." Franklin C. McLean, *chairman*: Nicolay Eeg-Larsen, "Glycolysis in epiphyseal cartilage."

17 July. Chemistry and physiology of the parathyroid hormone, John E. Howard, *chairman*: H. Rasmussen, "Studies on the isolation of the parathyroid hormone"; C. Rich, M. Horwith, D. Thompson, and H. Rasmussen, "Physiological effects of purified parathyroid hormone in humans." E. C. Reifenstein, Jr., *chairman*: E. Kodicek, "Metabolism of vitamin D."

18 July. Current research trends, Wallace D. Armstrong, *chairman*: contributed short papers, to be selected.

Chemistry at Interfaces

Stephen Brunauer, *chairman*
Norman Hackerman, *vice chairman*

21 July. Chemical reactions at interfaces, Herman E. Ries, Jr., *chairman*: E. A. Gulbransen, "Structural aspects of reactions at solid-gas interfaces"; Alexandre Rothen, "Studies of enzymatic reactions at a solid-liquid interface"; J. H. Schulman, "Selective interaction of sodium and potassium ions with surface active agents at solid-liquid and liquid-liquid interfaces."

22 July. Electrical phenomena at interfaces, H. van Olphen, *chairman*: Pasupati Mukerjee, "Some interactions of amphipathic ions in aqueous solutions"; D. T. Rogers, "Tribo-electric properties of distillate fuels"; David C. Grahame, "Factors affecting the adsorption of ions at interfaces."

23 July. Adsorption, L. E. Copeland, *chairman*: A. C. Zettlemoyer, "Chemisorption on metals"; Fred Karush, "Adsorption of small molecules by proteins"; G. M. Schwab, "Chemisorption and catalysis."

24 July. Interfaces in dispersed systems, A. J. G. Allan, *chairman*: R. K. Iler, "Recent developments in the surface chemistry of silica and silicates"; C. R. Singleterry, "Detergents in organic media"; R. D. Vold, "Packing and ionization of layers of sodium dodecyl sulphate adsorbed on carbon particles"; A. M. Gaudin, "Induced hydrophobicity in minerals."

25 July. General discussion.

High-Pressure Research

J. M. Lupton, *chairman*

28 July. High-pressure synthesis, C. M. Sliepcevich, *chairman*: H. Tracy Hall, "High-pressure, high-temperature developments"; C. Walling, "Organic reactions at high pressures." *Transport properties,* A. Michels, *chairman*: John Ross, "Transport processes in dense gases"; R. B. Dow, "Rheological properties at high pressures."

29 July. Measurement, correlation, and utilization of pressure, volume, and temperature data, W. C. Edmister, *chairman*: V. J. Berry, "Effects of pressure, temperature, and composition on the behavior of a gas condensate system"; A. Bondi, "A corresponding-states correlation without critical constants—application to the PVT properties of higher molecular weight hydrocarbons"; L. N. Canjar, "Treatment and correlation of light hydrocarbon PVT data"; J. B. Opfell, "Some limitations on applications of equations of states."

30 July. Solid state, H. G. Drickamer, *chairman*: H. Brooks, "Review of recent work on the effects of pressure on semiconductors"; W. B. Daniels and Charles S. Smith, "Single-crystal elastic constants to 10,000 atmospheres." *Optical properties,* A. W. Lawson, *chairman*: H. G. Drickamer, "Optical studies on the structure of solids"; B. Vodar, "Recent results on atomic and molecular spectra of compressed gases."

31 July. Geophysics, G. A. MacDonald, *chairman*: A. F. Birch, "Application of high-pressure research to problems in geophysics." *Molecular physics,* J. M. Lupton, *chairman*: A. Michels, "Some conclusions on interactions from recent high-pressure experiments."

1 Aug. Geochemistry, J. R. Gold-

smith, *chairman*: G. C. Kennedy, Rustum Roy, "Application of high-pressure research to problems in geochemistry."

Toxicology and Safety Evaluations

John A. Zapp, Jr., *chairman*
Don D. Irish, *vice chairman*

4 Aug. The laboratory animal in toxicity studies, Margaret Ives, *chairman*: L. Royal Christensen, "The endemic disease pattern in experimental animals"; C. N. Wentworth Cumming, "The care and nurture of laboratory animals." *The laboratory animal in toxicity studies,* O. G. Fitzhugh, *chairman*: Lloyd W. Hazleton and Bernard L. Oser, "The choice of animals as related to the interpretation of toxicity studies."

5 Aug. Statistical methods in toxicology, Carrol S. Weil, *chairman*: Jerome Cornfield, "Biometric approach to the planning and analysis of toxicity studies." *Estimation of hazards for man,* David W. Fassett, *chairman*: Hardin B. Jones, "Extension of laboratory and other data to populations."

6 Aug. Health hazards of nuclear reactors, Norton Nelson, *chairman*: Charles R. Williams, "The public heath aspect of nuclear reactors." *Metabolic and biochemical investigations in toxicity evaluations,* Arnold J. Lehman, *chairman*: F. A. Denz, to be announced.

7 Aug. Air pollution toxicology, Eugene R. Krackow, *chairman*: Herbert E. Stokinger, "Experimental evaluation of the toxicity of air pollutants"; Geoffrey Carey, "Clinical approach to the toxicity of air pollutants." *The role of judgment in toxicological research,* Don D. Irish, *chairman*: Maurice H. Seevers, "Horse sense in collecting and interpreting toxicological data."

8 Aug. Training of toxicologists, a panel discussion; Henry F. Smyth, Jr.; *chairman*: Henry F. Smyth, Jr., "The work and responsibilities of a toxicologist"; Elliott A. Maynard, "Past and current training of toxicologists"; E. M. K. Geiling, "Appropriate future training of toxicologists."

Chemistry and Physics of Metals

J. A. Krumhansl, *chairman*
E. I. Salkovitz and J. W. McClure, *vice chairmen*

11 Aug. Electronic structure—general: J. C. Slater, "Electron energy bands in metals"; A. F. Kip, "Cyclotron resonance"; D. H. Tomboulian, "Soft x-ray valence band emission studies."

12 Aug. Specific band determinations: G. Lehman, "Band structure of uranium and thorium"; J. R. Reitz, "Band structure of selenium and tellurium"; J. W. McClure, "Band structure of graphite." *Liquid metals*: S. Strauss, "Size effects in liquid alloys."

13 Aug. Transport properties: E. I. Salkovitz, "Transport properties in dilute alloys"; T. G. Berlincourt, "Hall

effect in metals and alloys"; A. I. Schindler, "Band dependent properties in transition metal alloys." *Elastic properties of metals and alloys*: J. R. Reitz, "Elastic constants of metals and alloys and electronic structure."

14 Aug. Point defects and electronic properties: T. J. Rowland, "Nuclear magnetic resonance in copper and silver alloys"; W. Harrison, "Influence of lattice disturbances on point defect scattering"; L. Roth, "Scattering of Bloch waves"; F. J. Blatt, "Thermoelectric power of noble metal alloys."

15 Aug. Special topics: L. Apker, "Recent progress in photoelectric emission"; H. Brooks, recapitulation.

Infrared Spectroscopy

F. A. Miller, *chairman*
V. Z. Williams, *vice chairman*

18 Aug. Spectra of trapped species, B. Crawford, Jr., *chairman*: J. A. A. Ketelaar, "Infrared spectra of crystalline solid solutions"; G. C. Pimentel, "Matrix methods." *Infrared spectra of adsorbed molecules*: A. Terenin, "Infrared spectra of molecules adsorbed on solid surfaces"; William A. Pliskin and R. P. Eischens, "The infrared spectra of carboxylic acids chemisorbed on metals and metal oxides."

19 Aug. Measurement of vibrational relaxation times, G. C. Pimentel, *chairman*: K. E. Shuler, "Theoretical aspects"; S. H. Bauer, "Experimental aspects." *Detectors for the infrared region*: E. F. Daly, "Infrared detectors."

20 Aug. Infrared intensities, D. A. Ramsay, *chairman*: D. F. Eggers, Jr., "Infrared intensities from band area measurements"; J. H. Jaffe, "Infrared intensities from dispersion measurements." *Raman intensities*: M. V. Volkenstein, "Theoretical aspects"; L. A. Woodward, "Experimental aspects."

21 Aug. The origin of group frequency shifts, V. Z. Williams, *chairman*: D. H. Whiffen, "Physical effects"; L. J. Bellamy, "Chemical effects." *Group intensities*: R. N. Jones, "Infrared intensities in liquid and solution phases."

22 Aug. F. A. Miller, *chairman*: L. J. Bellamy, B. Crawford, Jr., J. A. A. Ketelaar, R. C. Lord, H. W. Thompson, and N. Wright, "Infrared: its present needs and future directions," panel discussion.

Glass

James E. Archer, *chairman*
R. J. Charles, *vice chairman*

Physicochemical Aspects of Glass

25 Aug. General introduction: R. W. Douglas, "Transport phenomena in glasses"; (speaker to be announced), "Thermodynamic considerations of glasses and slags."

26 Aug. J. Uys, "Water in silicate melts"; panel presentation, "Room temperature reactivity of glasses."

27 Aug. J. Gibbs, "Nature of the glass transition in linear polymers"; W. Hillig, "Kinetic stability of the glassy state."

28 Aug. S. W. Barber, "Dispersion of acoustic waves at low temperature in binary alkali silica glass and its relation to other mechanical properties"; R. J. Charles, "Effect of temperature and atmosphere on the corrosion fatigue of lime glass."

29 Aug. Summary discussion; overflow papers; business meeting.

W. GEORGE PARKS
Department of Chemistry, University of Rhode Island, Kingston

Society Elections

■ The Radiological Society: pres. and AAAS Council representative, Leo G. Rigler, Cedars of Lebanon Hospital, Los Angeles, Calif.; pres.-elect, Laurence L. Robbins, Massachusetts General Hospital, Boston; historian, Howard P. Doub, Henry Ford Hospital, Detroit, Mich.; sec.-treas., Donald S. Childs, 713 E. Genesee Street, Syracuse, N.Y. The vice-presidents are Robert D. Moreton, Fort Worth, Tex., James W. J. Carpenter, Chicago, Ill., and Everett L. Pirkey, Louisville, Ky.

■ Institute of Mathematical Statistics: pres., L. J. Savage, Eckhart Hall, University of Chicago; pres.-elect., Jacob Wolfowitz, Department of Mathematics, Cornell University (after late May 1958); sec., George E. Nicholson, Jr., Department of Statistics, University of North Carolina, Chapel Hill, N.C.; treas., A. H. Bowker, Department of Statistics, Sequoia Hall, Stanford, Calif. The representative to the AAAS is Harold Hotelling, Institute of Statistics, University of North Carolina.

■ American Academy for Cerebral Palsy: pres., William T. Green; pres.-elect, Robert A. Knight; treas., Samuel B. Thompson; sec., Raymond R. Rembolt, University Hospital, Iowa City, Iowa.

■ Optical Society of America: pres., Irvine C. Gardner; pres.-elect, John Strong; junior past pres., Ralph A. Sawyer; v. pres. for meetings, Stanley S. Ballard; sec., Kasson S. Gibson, National Bureau of Standards, Washington 25, D.C.; treas., E. D. McAlister; sec. for local sections, W. Lewis Hyde. The representative to the AAAS Council is C. C. Kiess, National Bureau of Standards, Washington, D.C.

■ American Mathematical Society: pres., Richard Brauer, Department of Mathematics, Harvard University; pres.-elect, E. J. McShane, University of Virginia; sec., John W. Green, Department of Mathematics, University of California, Los Angeles 24, Calif.; treas., Albert L. Meder, Jr., New York, N.Y. The vice presidents are Garrett Birkhoff, Harvard University, and Salomon Bochner and N. E. Steenrod, Princeton University. The representative to the AAAS Council is W. L. Duren, University of Virginia.

Forthcoming Events

March

31–2. Utilization of Atomic Energy, College Station, Tex. (R. E. Wainerdi, A.&M. College of Texas, College Station, Tex.)

April

1. Microcirculatory Conf., 5th, Buffalo, N.Y. (S. R. M. Reynolds, Dept. of Anatomy, Univ. of Illinois College of Medicine, 1853 W. Polk St., Chicago 12.)

1–2. Alabama Acad. of Science, annual, Birmingham. (H. M. Kaylor, Dept. of Physics, Birmingham-Southern College, Birmingham.)

1–2. Freezing and Drying Symp., 2nd Internatl., London, England. (L. G. Beckett, Institute of Biology, 41 Queen's Gate, London, S.W.7.)

1–3. Corrosion Control, 5th annual conf., Norman, Okla. (M. L. Powers, Extension Div., Univ. of Oklahoma, Norman.)

2–4. American Assoc. of Anatomists, annual, Buffalo, N.Y. (L. B. Flexner, Dept. of Anatomy, School of Medicine, Univ. of Pennsylvania, Philadelphia 4.)

2–4. Instruments and Regulators Conf., Newark, Del. (W. E. Vannah, Control Engineering, 330 W. 42 St., New York 36.)

3–5. Pennsylvania Acad. of Science, annual, Easton, Pa. (G. R. Stevens, Dept. of Geology and Geography, Lafayette College, Easton.)

4–5. Southern Soc. for Philosophy and Psychology, annual, Nashville, Tenn. (W. B. Webb, U.S. Naval School of Aviation Medicine, Pensacola, Fla.)

7–11. American Assoc. of Cereal Chemists, annual, Cincinnati, Ohio. (J. W. Pence, Western Utilization Research Laboratories, Albany, Calif.)

8–10. Electronic Waveguides Symp., New York. (J. Fox, Microwave Research Inst., Polytechnic Inst. of Brooklyn, 55 Johnson St., Brooklyn 1, N.Y.)

9–12. National Council of Teachers of Mathematics, Cleveland, Ohio. (M. H. Ahrendt, NCTM, 1201 16 St., NW, Washington 6.)

9–14. Applied Psychology, 13th internatl. cong., Rome, Italy. (L. Meschieri, National Inst. of Psychology, Rome.)

10–11. American Inst. of Chemists, annual, Los Angeles, Calif. (L. Van Doren, AIC, 60 E. 42 St., New York 17.)

10–12. Biometric Soc., ENAR, Gatlinburg, Tenn. (T. W. Horner, General Mills, Inc., 400 Second Ave. South, Minneapolis 1, Minn.)

10–12. National Speleological Soc., annual, Gatlinburg, Tenn. (G. W. Moore, Geology Dept., Yale Univ., New Haven, Conn.)

10–12. Ohio Acad. of Science, annual, Akron, Ohio. (G. W. Burns, Dept. of Botany, Ohio Wesleyan Univ., Delaware.)

11. Vitamin B-12 Symp., New York, N.Y. (Miss J. Watson, 451 Clarkson Ave., Brooklyn 3, N.Y.)

11–12. Eastern Psychological Assoc., annual, Philadelphia, Pa. (G. Lane, Dept. of Psychology, University of Delaware, Newark.)

11–12. Montana Acad. of Sciences, annual, Missoula. (L. H. Harvey, Montana State Univ., Missoula.)

11–18. Horticultural Conf., 15th internatl., Nice, France. (Secretariat General, 84, rue de Grenelle, Paris 7e, France.)

12. Society for the Scientific Study of Religion, New York. (L. Whitman, 297 Fourth Ave., New York, N.Y.)

13–14. American Soc. for Artificial Internal Organs, Philadelphia, Pa. (G. Schreiner, Georgetown Univ. Hospital, Washington 7.)

13–18. American Chemical Soc., 133rd, San Francisco, Calif. (R. M. Warren, ACS, 1155 16 St., NW, Washington 6.)

13–19. Federation of American Societies for Experimental Biology, annual, Philadelphia, Pa. (M. O. Lee, FASEB, 9650 Wisconsin Ave., Bethesda 14, Md.)

14–16. Automatic Techniques Conf. Detroit, Mich. (J. E. Eiselein, RCA, Bldg. 10–7, Camden 2, N.J.)

14–18. American Assoc. of Immunologists, annual, Philadelphia, Pa. (F. S. Cheever, Graduate School of Public Health, Univ. of Pittsburgh, Pittsburgh 13, Pa.)

14–18. American Soc. for Experimental Biology, annual, Philadelphia, Pa. (J. F. A. McManus, Univ. of Alabama Medical Center, Birmingham.)

14–18. American Soc. of Biological Chemists, annual, Philadelphia, Pa. (P. Handler, Dept. of Biochemistry, Duke University School of Medicine, Durham, N.C.)

15–17. Gas Measurement, 34th annual conf., Norman, Okla. (M. L. Powers, Extension Div., Univ. of Oklahoma, Norman.)

16–25. Instruments, Electronics and Automation Conf., London, England. (Industrial Exhibitions Ltd., 9 Argyll St., London, W.1.)

17–18. Environmental Engineers, 2nd annual institute, New York. (Institute of Environmental Engineers, 9 Spring St., Princeton, N.J.)

17–18. Midwest Benthological Soc., annual, Madison, Wis. (K. M. Mackenthun, 453 State Office Bldg., Madison 2.)

17–19. Association of Southeastern Biologists, annual, Tallahassee, Fla. (J. C. Dickinson, Jr., Dept. of Biology, Univ. of Florida, Gainesville.)

17–19. Eastern Colleges Science Conf., 12th annual, Wilkes-Barre, Pa. (Mrs. E. Stevens, Wilkes College, Wilkes-Barre.)

(*See issue of 21 February for comprehensive list*)

school Latin, if I had not majored in college German or had the minimum exposure to French with which to face the old-fashioned language requirements in graduate school, if I had not accidentally acquired a smattering of reading Spanish, and, most particularly, if my mother tongue were other than English, I could not have read more than a word or two here and there. I am quite sure this potential bias applies to Cleveland's entire test sample of scientific readers.

If, as has been suggested, scientific training programs should drop their language requirements, will not their future trainees have to "learn" Interlingua—less laboriously than they would learn French or German, perhaps, but learn it none the less—a language with no integral form, with a limited and makeshift vocabulary (apparently chosen simply as sops to half-a-dozen current languages), and with a basic syntax that actually requires a fair facility in English? If it should turn out that Swedish, Japanese, German, Russian, Hindi, or even English-speaking scientists require a basic facility in several languages in order to communicate precisely in Interlingua, then indeed we might have been hoaxed, and our energies might better have focused in the first place on the adoption, for international scientific use, of one of the modern languages—one in which precise communication *can* be effected and in which scientific literature can accurately be read by librarians, editors, and even laymen, as well as by scientists.

ALAN MATHER

Memorial Hospital,
Wilmington, Delaware

Watson Davis's article on "Babel Resolved" [*Science* **126**, 55 (1957)] made interesting reading, even if not everybody would agree with every point of it. However, he touched only one out of four aspects of this problem.

For scientists, *babel* means difficulties (i) in reading foreign science abstracts; (ii) in reading foreign articles; (iii) in personal correspondence with foreign workers in the same field; and (iv) in oral discussions with foreigners at international conferences. International use of English has largely overcome some of these difficulties. We have, in Washington, services which translate abstracts directly into English without need for Interlingua. Most foreign scientists may not be expert in English but can at least write a decipherable letter in broken English. But at international conferences we keep meeting the Frenchman who does not understand your English question and who can answer it only in French after someone translates it for him, not to mention the American sci-

entist who feels ill at ease at a conference in Paris. Also, how many of us can read most of the foreign scientific literature easily enough to actually do so? Foreign articles and oral discussions in foreign languages are therefore our main problems.

Forrest F. Cleveland [*Science* **126**, 64 (1957)] rightly says that translation of articles is not a satisfactory solution, if it is practicable at all. Where would we find all the translators it would require? A solution will be found only if and when we scientists all write originally in one and the same chosen language, and do the writing ourselves.

I agree with Watson Davis that *if* one knows enough other languages, then one can usually *guess* the meaning of a sentence in Interlingua or Esperanto after reading it two, three, or four times. The question of readability at sight, however, is rather irrelevant. *Any* language with an international vocabulary (there are several) is more or less easy to decipher. The main difficulty is not in the reading but in the writing, the speaking, the understanding of the spoken word. The greater regularity of Esperanto over Interlingua makes Esperanto greatly preferable. The confusion created by Interlingua's so-called "natural" accentuation of syllables (whatever that means) is sufficient to make a person understand why, at conferences, Interlingua (though admitted for written abstracts) has never found oral use even as a secondary language, contrary to the situation with respect to Esperanto, which is used every year by thousands at international congresses in which is is the only congressional language.

Esperantists don't claim that texts in Esperanto would be completely understandable to persons too lazy to learn even the simplest elements of the language (though, if you try it out for yourself, you may find Esperanto just about as easy as Interlingua). But we do claim that it is some five times easier to learn it for active use than it is to learn any national language. I was able to translate *into* it, faultlessly, from the daily newspaper after 18 hours of pleasantly easy study. (Since I already knew a couple of other languages, learned in highschool, some may be a bit slower.) To learn to *read* Esperanto requires much less time.

I admit that if right now we could make Esperanto internationally a required subject for all sixth-grade school children, it would yet take many years before they would start using it generally for international communication. But at that time they would like to find abstracts of older papers published in Esperanto rather than in Interlingua.

There was a time when German was *the* international language for physics and for some other branches of science.

Since 1933, English has taken its place. In this world nothing lasts forever. The present position of English will last an even shorter time if no funds and no legislation are available to get high-school children interested in science, as might be achieved if instruction were given by people who, by acquiring an M.S. or Ph.D. degree in the subject they teach, had shown that they are interested themselves and have, as background, an understanding of the epoch-making progress in science that is being made, to a degree not likely on the basis of undergraduate courses alone. If it is utopian to expect this, then I keep my fingers crossed for our English-speaking descendants and hope that the next change of international language will be a switch to Esperanto rather than to German, Russian, or what else. To achieve this in time, however, the Esperanto movement needs solid support now.

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Significantly, the "spread in the use of Interlingua" in scientific publications has been largely spontaneous. Many editors have felt a need for such a means of increasing the number of readers of their journals and of thus facilitating the advancement of their field of science. Upon seeing a sample of Interlingua, they have been impressed with its readability, have investigated its suitability for use in their journal, and have decided finally to use it for summaries or otherwise.

The contents of *Spectroscopia Molecular* have included not only "summaries" and "news notes" but also short technical articles and three technical monographs published in serial form before being collected into book form. Copies of the first monograph have been sold in 25 states of the United States and in 19 other countries, while the second has been sold in 15 states and in 9 other countries—despite the fact that the material was already available in the journal. It seems quite certain that this demand for the monographs, and for the quite technical issues of the journal, would not have existed unless the buyers had felt that Interlingua was a "precise, universal, and 'scientific' language."

Most persons, including scientists, will (and should) continue to have some knowledge of European languages as a part of their general educational and cultural background. The greater this knowledge the easier it will be to use Interlingua. But even if scientists must learn Interlingua from the very beginning, they will find that this requires less time than is needed to learn one of the national languages. Besides, it seems