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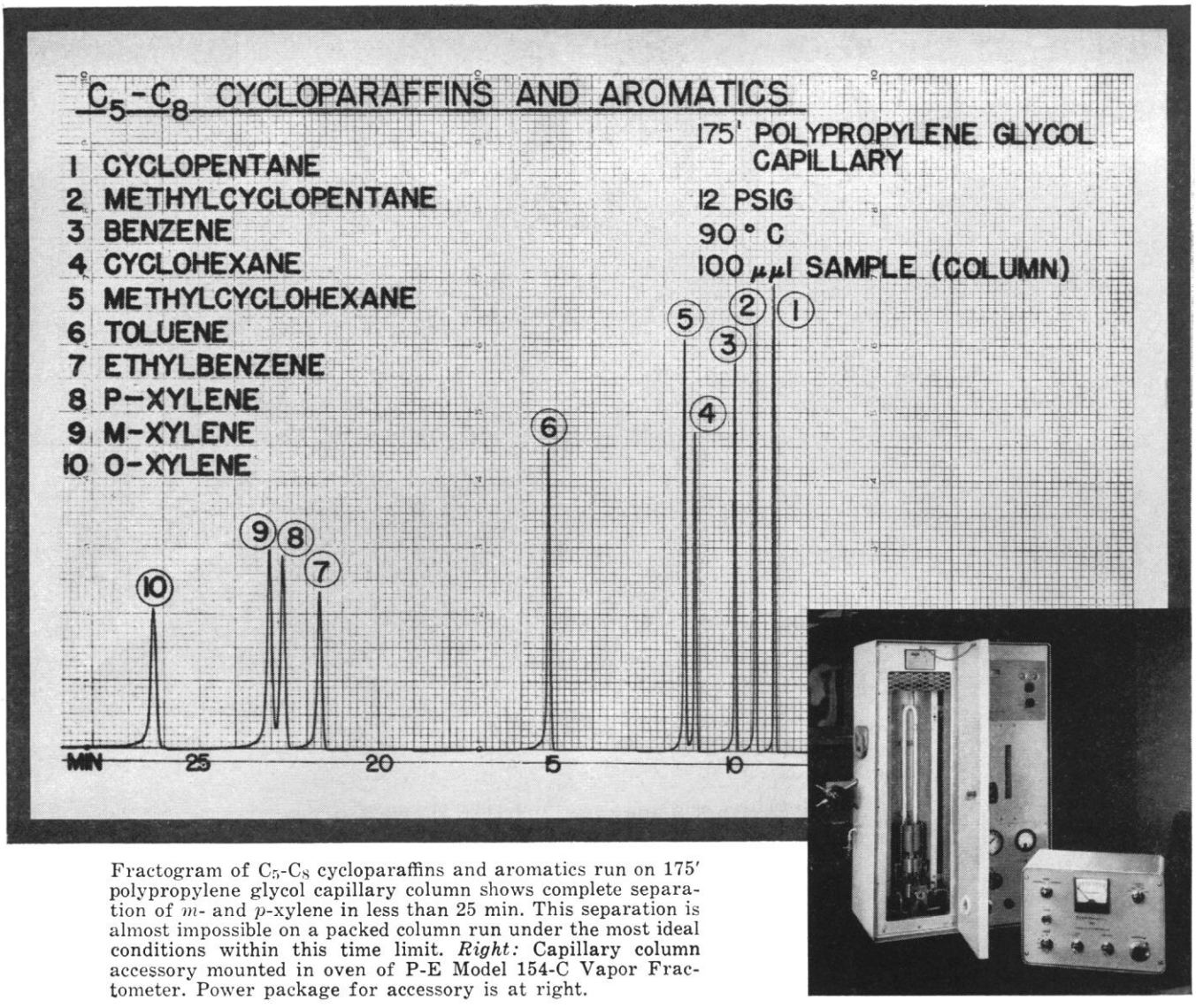

Fractogram of C_5-C_8 cycloparaffins and aromatics run on 175' polypropylene glycol capillary column shows complete separation of *m*- and *p*-xylene in less than 25 min. This separation is almost impossible on a packed column run under the most ideal conditions within this time limit. *Right:* Capillary column accessory mounted in oven of P-E Model 154-C Vapor Fractometer. Power package for accessory is at right.

New Developments in Gas Chromatography make the P-E Model 154-C Vapor Fractometer more versatile than ever

Golay column-ionization detector system increases analytical range and precision

Now you can update your gas chromatographic techniques with the latest and most revolutionary developments in this analytical field: capillary columns and ultra-sensitive ionization detectors. The Model 154-C Vapor Fractometer makes available to you all of the instrument's reliable, proven analytical features, *plus* an integrated separation and detection system consisting of a Golay column and flame ionization detector, or a Golay column and beta-ray ionization detector, both with associated power package. The fractogram above shows how these combinations enhance the range and resolution of the new Model 154-C.

But more—these "packaged" high-sensitivity resolution and detection systems are now available to present owners of Perkin-Elmer Model 154-B and Model 154-C Vapor Fractometers. The assembly is quickly interchangeable with its counterparts in your present Perkin-Elmer instrument, or can be used in parallel with P-E's packed columns and hot wire and thermistor detectors. Thus, in minutes you can multiply the capabilities of the instrument for extremely precise analyses.

Another point to remember as you consider updating your VPC equipment: the principle of capillary columns in VPC was a Perkin-Elmer discovery, and this system for the Model 154-C was designed and built by the same team of specialists who engineered gas chromatography into a practical instrumental technique.

For complete information on these new developments in gas chromatography, write Perkin-Elmer Corp., 910 Main Ave., Norwalk, Conn.

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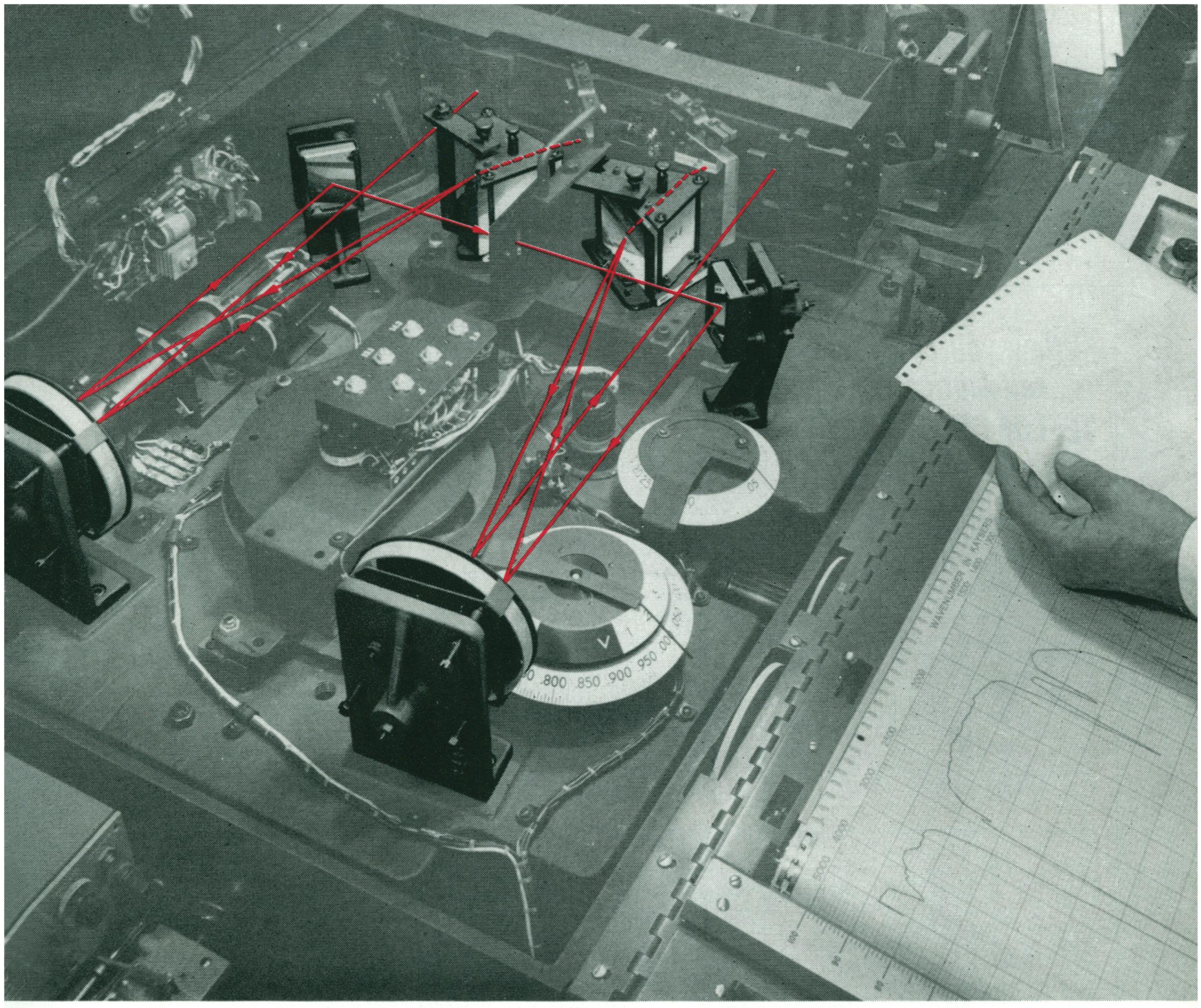

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It's a Fact: The Beckman 15A Infrared Analyzer, due to its sensitivity and rapid response, can detect the photosynthesis of a leaf exposed to a one-second flash of light – equal to the production of less than one-billionth pound of sugar.

Letters

Private Spending for Science

I hold a view that differs from that of P. W. Hutson [*Science* **129**, 1369 (1959)]. In my opinion private expenditures for scientific or educational institutions for public welfare have, on the whole, done more good than comparable expenditures by the Federal Government. In short, I believe a man expending money that he himself has earned will usually do a better job than a politician expending someone else's money; there is more objective consideration of real human welfare, less influence of human selfishness.

That "disaster could overtake us" is more likely to follow from unwise government expenditure than from unwise private expenditure. In Russia at present the "primacy of the larger society" is nearly absolute. I think it should be lessened if not "undermined."

PAUL W. MERRILL
1380 New York Drive,
Altadena, California

Teaching and Research

A point of fundamental importance was raised by Edmund M. Spieker [*Science* **129**, 1324 (1959)] in his answer to Fourman's earlier letter on the undervaluation of teaching ability in comparison with research performance, as measured by publications, in the evaluation of college professors. The point he makes, and seems to accept as an established fact, is that teaching ability cannot exist without the stimulus of research. Furthermore, he specifically applies this thesis to undergraduate college teaching.

It is not my intention to argue this point, but I do wonder whether it has ever been proved. Whether or not one can recall excellent but "unproductive" professors from his college days is probably not pertinent, but it is strange that scientists will make a statement like Spieker's without presenting a scrap of supporting evidence. He says that in all the literature that he has read "on this troublesome subject" there is little or no mention of this matter. As a matter of fact, I have heard the "troublesome subject" resolved in Spieker's way many times; perhaps it is all right to say such things without documenting them.

Many years ago a project (participated in by the AAAS) seemed to demonstrate that the undergraduate background most likely to lead to the doctorate in science is to be had in small colleges. Is it possible that the professors in such institutions are more active in research than those in large universities, and is the impression some of us hold that the professors in small schools are not very active "publishers" wholly incorrect?

Until a relationship has actually been demonstrated it is not safe to assume on philosophical grounds alone that good teaching necessarily depends on whether the teacher is actively engaged in research. This is an important point to resolve because many potentially excellent teachers *may* be doing less than their best teaching in an effort to satisfy the university administration by doing research—research that may very well needlessly add to the volume of scientific publications. In some fields, at least, we could profit by fewer but more significant publications.

JESSE D. RISING
Department of Postgraduate Medical Education, School of Medicine, University of Kansas Medical Center, Kansas City

"Personal Liberties" Threatened?

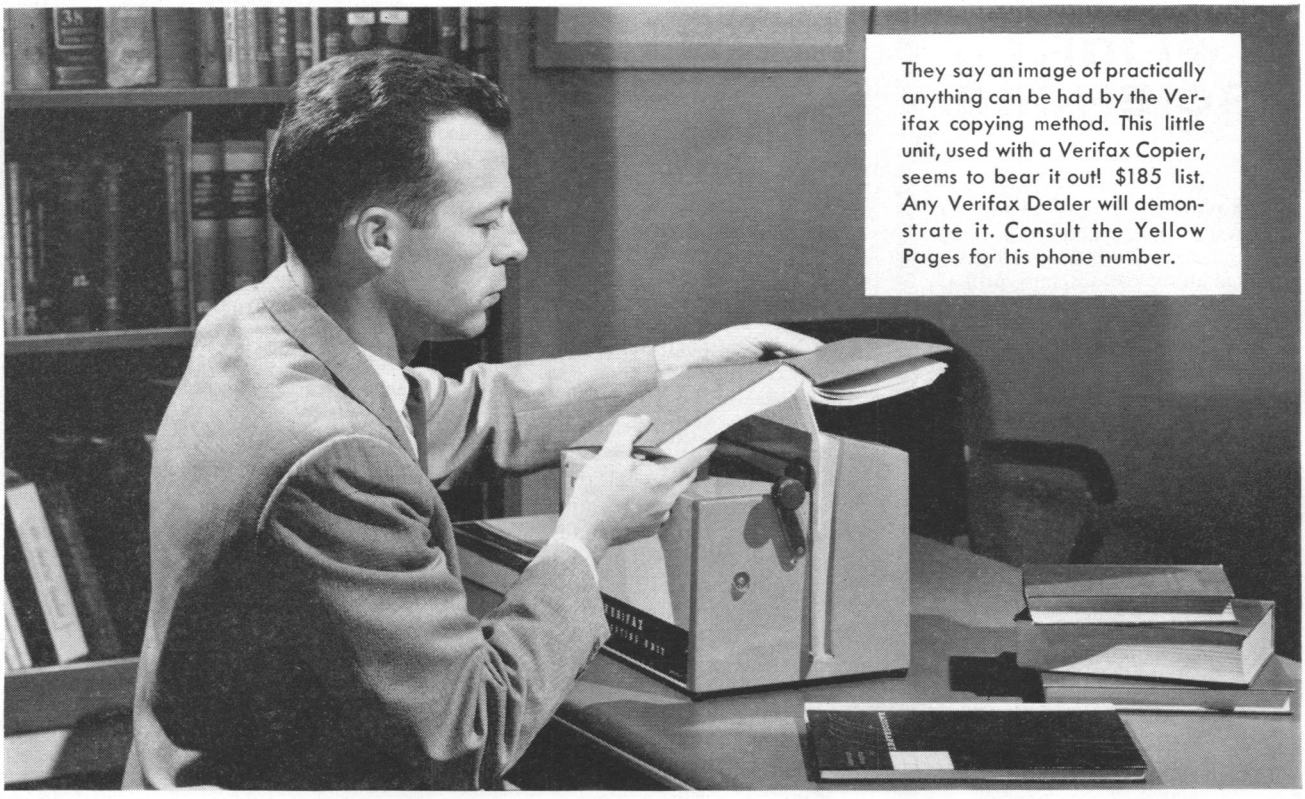
In the News of Science section [*Science* **129**, 625 (1959)], headed "Loyalty Provisions of National Defense Education Act Meet Opposition from Educators and Congressmen," were published quotations from a letter signed by the president and general secretary of the American Association of University Professors. The part that especially irked me was, " 'the Act seems to say to members of the educational community: ". . . you are a particularly suspect part of the population and will have to pass a special test that other citizens need not take." ' "

I do not see why *they* should feel picked on. After all, there are a few million citizens in military and civil service who take oaths of allegiance and every few months are asked to check the attorney general's list of subversive organizations to make sure they have not inadvertently fallen into the clever trap of the communists, who organize or infiltrate organizations with the most innocent and patriotic sounding names. One may, of course, think that those in the U.S. military or civil service take loyalty oaths because they receive money from the government. The National Defense Education Act will also give government money to those successful applicants who are asked to take the oath and sign the disclaimer affidavit. Not that I believe for one moment that the requirement of taking an oath is going to deter a real communist from doing *anything*, but I do believe signing the disclaimer affidavit may alert an unsuspecting youth to communist psychological warfare tactics. It may even prevent him from innocently becoming so involved in suspect organi-

(*Continued on page 106*)

Kodak reports on:

copying as you go . . . items for EDTA to rob of color



They say an image of practically anything can be had by the Verifax copying method. This little unit, used with a Verifax Copier, seems to bear it out! $185 list. Any Verifax Dealer will demonstrate it. Consult the Yellow Pages for his phone number.

The chelatometrist and the gas chromatographer should be our friends

Though these lines were written on a chilly evening in April, they are very likely being read when it's too hot for tedious ruminations on chelatometry and gas chromatography. All we want to do is hop on the bandwagon, both bandwagons. Between the writing and the reading, Hahnemann Medical College & Hospital honored Chelation on May 6, 7, and 8 by a capital "C" and a symposium on "Metal-Binding in Medicine"; and many a laboratory which had no gas chromatograph in April had one by July. When these things pick up momentum, none dare stand in the way.

And why should we fear either of these powerful new passions that stir chemists?

What is a chelatometric indicator but a colorimetric reagent which will permit *(Ethylenedinitrilo)tetraacetic Acid Disodium Salt* (Eastman 6354, "EDTA") to rob it of its metal ions under specified conditions? Are we not widely admired for the reliability of our colorimetric reagents? Have we not refrained from listing a colorimetric reagent as a chelatometric indicator without first finding a literature reference to such use? Do we not even proselyte for chelatometry by offering copies of a list of Eastman Chelatometric Indicators covering

aluminum	lead	sodium
barium	magnesium	strontium
bismuth	manganese	sulfur
cadmium	mercury	thallium
calcium	nickel	thorium
cerium	palladium	tin
chromium	platinum	titanium
cobalt	plutonium	uranium
copper	potassium	vanadium
gallium	rare earths	yttrium
indium	scandium	zinc
iron	silver	zirconium?

Of course we do.

As for gas chromatography, should we be dismayed that 30¢-a-quart motor oil on ground firebrick can exhibit a differential in delay time for the components of a vapor mixture? That corn flakes or one of the popular four-letter household detergents can work? Can any serious chromatographer, mindful of the need for breadth of choice in stationary-phase liquids to fit instantly the largest variety of chromatographic occasions, doubt the wisdom of at once ordering

929 Benzyl Ether
3035 2-(Benzyloxy)ethanol
4738 Bis(2-ethoxyethyl) Ether
P4739 Bis[2-(2-methoxyethoxy)-ethyl] Ether
P6447 Di-n-decyl Phthalate
1968 N,N-Diethylformamide
5870 N,N-Dimethylformamide
2627 n-Propyl Sulfone
7311 Squalane
5404 Tetra-iso-butylene
P4770 Tri-iso-butylene
T4420 Tritolyl Phosphate . . . ?

He can, but he shouldn't. A purchase order for $34.30 would fetch him the whole group, including enough of even the more expensive ones to treat a column of packing.

Have it made out to Distillation Products Industries, Rochester 3, N. Y. Whoever wants to fuss around with List No. 41 *looking up individual items among more than 3700 Eastman Organic Chemicals we offer or wants the chelatometric list should write to the same address.*

Prices are subject to change without notice.

Kodak
TRADE MARK

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

Meetings

Nuclear Optical Model

During the past two years the state of Florida, under the leadership of Governor Collins, has taken steps to build up nuclear science both at the University of Florida (Gainesville) and at Florida State University (Tallahassee). At Tallahassee preparations are being made for the installation of a tandem electrostatic accelerator and an electron accelerator. Both accelerators are being purchased by the state of Florida from the High Voltage Engineering Corporation.

An international conference on the "Nuclear Optical Model" was held in Tallahassee on 16–17 March 1959. This conference was organized by A. E. S. Green, who is primarily responsible for the initiation of the nuclear physics program at Tallahassee. In addition to its scientific purpose, the conference gave the visiting physicists an opportunity to learn of the plans of the nuclear physics group at Florida State.

Because of Green's extensive research on problems related to the bulk properties of nuclear matter, the choice of the topic of the conference was a natural one. In spite of the specialized nature of the topic, almost 100 nuclear physicists from many countries attended the meetings. Unfortunately, the physicists who had been invited from the U.S.S.R. did not come to the conference.

The optical model of the nucleus attempts to describe nuclear matter by assigning it properties which correspond, in the theory of light, to the refractive index and absorption coefficient of the medium. In nuclear physics one is not concerned with light waves but with the interaction of particles with nuclei. The quantity analogous to the wavelength of light is the wavelength of the particles, and the quantities analogous to the refractive index and absorption coefficients are the real and imaginary parts of the nuclear potential.

The optical model was first proposed to account for experiments on the interaction of neutrons with nuclei. These experiments had shown results which looked very much like interference and diffraction effects. At first, only qualitative fits were attempted, but more recently calculations have been performed to account for the experimental results quantitatively.

One of the sessions of the conference was concerned with the question of how well the experimental data could be fitted by optical-model calculations and of what detailed modifications of the potential had to be introduced. For example, the effect of variations of the depth of the nuclear potential at the nuclear surface and the effects of deviations of the shape of the nucleus from

a sphere were discussed. In general, surprisingly good fits to the experiments were obtained, although there are still some experimental results which offer problems in fitting.

In another session the question of the foundation of the optical model was discussed. The model represents only a phenomenological description of the nuclear interactions and has to be justified in terms of more fundamental properties of nucleons.

An excellent summary was presented at the close of the conference by R. E. Peierls of Birmingham (England). Among Peierls' comments were the following: The detailed fits which are being attempted now with optical-model calculations go far beyond what had been contemplated when this model was first applied. Different authors may arrive at different parameters in fitting the same data, the variation depending upon the authors' philosophy—that is, upon how much variation with energy and atomic weight each is willing to allow in order to obtain detailed fits. So far the fits have not been capable of answering the important theoretical question of whether the absorptive part of the potential is peaked near the nuclear surface. It was surprising to learn that almost the same parameters could be used to fit the interaction of protons and neutrons with nuclei as are used to fit the interactions of composite projectiles such as deuterons and α-particles. One would have expected, for example, that a deuteron would have a very small chance of passing through a nucleus without breaking up. As a result, the absorptive part of the potential would have been expected to be much larger for deuterons than for nucleons.

The complete proceedings of the conference were prepared in the record time of a little over a month, and copies may be obtained by writing to Professor A. E. S. Green at Florida State University.

H. H. BARSCHALL
Department of Physics,
University of Wisconsin, Madison

Forthcoming Events

August

10–13. National Medical Assoc., Detroit, Mich. (J. T. Givens, 1108 Church St., Norfolk, Va.)

10–13. Society of Automotive Engineers, natl. West Coast meeting, Vancouver, B.C., Canada. (R. W. Crory, Meetings Operation Dept., SAE, 485 Lexington Ave., New York 17.)

16–19. Botanical Nomenclature, discussions (Intern. Bureau for Plant Taxonomy and Nomenclature), Montreal, Canada. (J. Rousseau, Natl. Museum, Ottawa, Canada.)

16–21. American Pharmaceutical As-

soc., Cincinnati, Ohio. (R. P. Fischelis, APA, 2215 Constitution Ave., NW, Washington 7.)

17. Ultrasonics, natl. symp., San Francisco, Calif. (L. G. Cumming, Inst. of Radio Engineers, 1 E. 79 St., New York 21.)

17–21. Pacific Southwest Assoc. of Chemistry Teachers, Pacific Grove, Calif. (W. A. Craig, 416 N. Citrus Ave., Los Angeles 36, Calif.)

17–22. Logopedics and Phoniatrics, 11th intern. cong., London, England. (Miss P. Carter, 46 Canonbury Square, London N.1, England.)

19–26. Refrigeration, 10th intern. cong., Copenhagen, Denmark. (M. Kondrup, Danish Natl. Committee, Intern. Congress of Refrigeration, P.O. Box 57, Roskilde, Denmark.)

19–29. Botanical Cong., 9th intern., Montreal, Canada. (C. Frankton, Secretary-General, 9th Intern. Botanical Cong., Science Service Bldg., Ottawa, Ontario, Canada.)

19–29. International Assoc. of Wood Anatomists, Montreal, Canada. (IAWA, Laboratorium für Holzforschung E.T.H. Universitatstrasse 2, Zurich, Switzerland.)

19–29. Mycological Soc. of America, Montreal, Canada. (E. S. Beneke, Dept. of Botany and Plant Pathology, Michigan State Univ., E. Lansing.)

19–29. Phycological Soc. of America, Montreal, Canada. (W. A. Daily, Dept. of Botany, Butler Univ., Indianapolis 7, Ind.)

20–22. Rocky Mountain Radiological Soc., Denver, Colo. (J. H. Freed, 4200 E. Ninth Ave., Denver 20.)

20–25. Chemical Thermodynamics, symp., Wattens, Austria. (F. Vorländer, Deutsche Bunsen-Gesellschaft, Carl-Bosh-Haus, Varrentrappstrasse, 40–42, Frankfort a.M., Germany.)

20–27. Therapeutics, symp., Gardone, Italy. (R. Morf, c/o Sandoz S.A., Basel 13, Switzerland.)

20–2. Limnological Cong., 14th intern., Vienna and Salzburg, Austria. (Secretary, 14th Intern. Limnological Congress, Biologische Station, Lunz am See, Austria.)

23–26. American Farm Economic Assoc., Ithaca, N.Y. (C. D. Kearl, Dept. of Agricultural Economics, Warren Hall, Cornell Univ., Ithaca.)

23–27. Veterinary Medicine, 3rd Pan-American Cong., Kansas City, Mo. (B. D. Blood, Pan-American Congresses of Veterinary Medicine, P.O. Box 99, Azul, Buenos Aires Province, Argentina.)

24–26. American Accounting Assoc., Boulder, Colo. (C. Cox, 437 Hagerty Hall, Ohio State Univ., Columbus 10.)

24–26. Anti-Submarine Warfare (classified), symp., San Diego, Calif. (R. R. Dexter, Inst. of the Aeronautical Sciences, 2 E. 64 St., New York 21.)

24–26. Dynamics of Conducting Fluids, symp. (American Rocket Soc. and Northwestern Univ.), Evanston, Ill., (J. J. Harford, ARS, 500 Fifth Ave., New York 36.)

24–27. American Hospital Assoc., New York, N.Y. (E. L. Crosby, 18 E. Division St., Chicago, Ill.)

24–28. Australian and New Zealand Assoc. for the Advancement of Science, 34th cong., Perth, Western Australia. (J. R. A. McMillan, Science House, 157 Gloucester St., Sydney, Australia.)

24–29. Infrared Spectroscopy Inst., 10th annual, Nashville, Tenn. (N. Fuson, Director, Infrared Spectroscopy, Fisk Univ., Nashville 8.)

24–29. International Assoc. for Hydraulic Research, cong., Montreal, Canada. (IAHR, c/o Laboratoire Hydraulique, Raam 61, Delft, Netherlands.)

24–29. Ionization Phenomena in Gases, 4th intern. conf., Upsala, Sweden. (A. Nilsson, Secretary-General, Inst. of Physics, Upsala, Sweden.)

24–29. Polarography, 2nd intern. cong., Cambridge, England. (Mrs. B. Lamb, Chemistry Lab., Evershed & Vignoles, Corner of Iveagh Ave., N. Circular Rd., London N.W.10, England.)

24–30. Modern Systems for Detecting and Evaluating Optical Radiation (Intern. Optical Commission), symp., Stockholm, Sweden. (S. S. Ballard, Dept. of Physics, Univ. of Florida, Gainesville.)

25–27. Petroleum Industry Conf., AIEE, Long Beach, Calif. (N. S. Hibshman, AIEE, 33 W. 39 St., New York 18.)

25–28. Alaskan Science Conf., Alaskan Div., AAAS, 10th, Juneau. (N. J. Wilimovsky, Bur. of Commercial Fisheries, Box 2021, Juneau.)

25–28. American Dietetic Assoc., 42nd annual, Los Angeles, Calif. (Miss R. M. Yakel, ADA, 620 N. Michigan Ave., Chicago 11, Ill.)

25–30. American Ornithologists' Union, Regina, Saskatchewan, Canada. (H. G. Deignan, Div. of Birds, U.S. National Museum, Washington 25.)

26–29. International Assoc. of Milk and Food Sanitarians, Glenwood Springs, Colo. (V. T. Foley, Health Dept., Kansas City, Mo.)

26–29. International Union of Pure and Applied Chemistry, 20th conf., Munich, Germany. (Div. of Chemistry and Chemical Technology, Natl. Research Council, Washington 25.)

27–29. American Assoc., of Clinical Chemists, 11th annual, Cleveland, Ohio. (A. Hainline, Jr., AACC, Cleveland Clinic Foundation, 2020 E. 93 St., Cleveland 6.)

27–29. American Physical Soc., Hawaii. (K. K. Darrow, APS, Columbia Univ., New York 27.)

28–29. Weather Modification (with American Soc. of Civil Engineers), conf., Denver, Colo. (H. G. Houghton, AMS, Dept. of Meteorology, Massachusetts Inst. of Technology, Cambridge 39, Mass.)

28–30. American Folklore Soc., annual, Albany and Cooperstown, N.Y. (MacE. Leach, 110 Bennett Hall, Univ. of Pennsylvania, Philadelphia 4.)

28–31. Astronomical League, Denver, Colo. (R. Dakin, 720 Pittsford-Victor Rd., Pittsford, N.Y.)

28–4. International Union for Scientific Study of Population, cong., Vienna, Austria. (F. Lorimer, Dept. of Sociology, American Univ., Washington, D.C.)

30–3. American Inst. of Biological Sciences, annual, University Park, Pa. (H. T. Cox, AIBS, 2000 P St., NW, Washington 6.)

30–4. American Cong. of Physical Medicine and Rehabilitation, Minneapolis, Minn. (Miss D. C. Augustin, 30 W. Michigan Ave., Chicago 2, Ill.)

30–4. Laurentian Hormone Conf., Mont Tremblant, Quebec, Canada. (G. Pincus, 222 Maple Ave., Shrewsbury, Mass.)

30–4. Medical Education, 2nd world conf., Chicago, Ill. (World Medical Assoc., 10 Columbus Circle, New York 19.)

30–5. World Federation for Mental Health, 12th annual, Barcelona, Spain. (Miss E. M. Thornton, Secretary-General, WFMH, 19, Manchester St., London W.1, England.)

30–6. History of Science, 9th intern. cong , Barcelona and Madrid, Spain. (J. Vernet, via Layetona 141, Barcelona.)

30–6. Residues on Crops and/or the Problem of Insect Resistance to Insecticides, symp., Munich, Germany. (R. Morf, Secretary-General, IUPAC, c/o Sandoz, S. A., Basel, Switzerland.)

31–3. Biological Photographic Assoc., Montreal, Canada. (Miss J. H. Waters, P.O. Box 1668, Grand Central Station, New York 17.)

31–3. Mathematical Assoc. of America, 40th summer meeting, Salt Lake City, Utah. (H. M. Gehman, MAA, Univ. of Buffalo, Buffalo 14, N.Y.)

31–4. Haematin Enzymes, symp. (by invitation), Canberra, Australia. (A. H. Ennar, John Curtin School of Medical Research, Australian National Univ., Canberra.)

(See issue of 19 June for comprehensive list)