

phers, 55th annual, Pittsburgh, Pa. (J. E. Guernsey, 9707 Parkwood Dr., Bethesda, Md.)

2-4. Association for Computing Machinery, Cleveland, Ohio. (J. Moshman, Corporation for Economic and Industrial Research, 1200 Jefferson Davis Highway, Arlington 2, Va.)

2-4. Optical Soc. of America, New York, N.Y. (S. S. Ballard, Dept. of Physics, Univ. of Florida, Gainesville.)

3-4. Eastern Psychological Assoc., Atlantic City, N.J. (C. H. Rush, Standard Oil Co. of New Jersey, Rockefeller Plaza, New York, N.Y.)

3-5. American Soc. for the Study of Sterility, Atlantic City, N.J. (H. H. Thomas, 920 S. 19 St., Birmingham 5, Ala.)

3-5. Cooper Ornithological Soc., Berkeley, Calif. (J. Davis, Univ. of California, Hastings Reservation, Jamesburg Route, Carmel Valley.)

5-9. American College of Obstetricians and Gynecologists, Atlantic City, N.J. (J. C. Ullery, 15 S. Clark St., Chicago 3, Ill.)

5-10. American Chemical Soc., 135th, Boston, Mass. (M. A. H. Emery, 18th and K St., NW, Washington, D.C.)

5-10. Nuclear Congress, Cleveland, Ohio. (S. Baron, Burns & Roe, Inc., 160 West Broadway, New York 13.)

6. Paleontological Research Institution, Ithaca, N.Y. (R. Harris, 109 Dearborn Rd., Ithaca.)

6-7. Chemical and Petroleum Instrumentation, 2nd natl. symp., St Louis, Mo. (H. S. Kindler, Director of Technical and Educational Services, ISA, 313 Sixth Ave., Pittsburgh 22, Pa.)

6-8. American Radium Soc., Hot Springs, Va. (R. L. Brown, Robert Winship Clinic, Emory Univ., Atlanta 22, Ga.)

6-8. Astronautics, AFOSR 3rd annual symp., Washington, D.C. (Headquarters, Air Force Office of Scientific Research, Washington 25.)

6-8. National Open Hearth Steel Furnace, Coke Oven and Raw Materials Conf., St. Louis, Mo. (E. O. Kirkendall, AIME, 29 W. 39 St., New York 18.)

6-9. American Acad. of General Practice, San Francisco, Calif. (M. F. Cahal, Volker Blvd. at Brookside, Kansas City 12, Mo.)

6-11. Coordination Chemistry, intern. conf., London, England. (Chemical Soc., Burlington House, London, W.1.)

12-13. American Soc. for Artificial Internal Organs, Atlantic City, N.J. (C. K. Kirby, ASAIO, 110 Maloney Bldg., University Hospital, 3600 Spruce St., Philadelphia 4, Pa.)

12-16. American Physiological Soc., Atlantic City, N.J. (R. C. Dagg, 9650 Wisconsin Ave., Washington, D.C.)

12-16. Fracture, intern. conf., Cambridge and Dedham, Mass. (Headquarters, Air Force Office of Scientific Research, Washington 25.)

13. Biochemical Cytology of Liver (Histochemical Soc.), symp., Atlantic City, N.J. (A. B. Novikoff, Dept. of Pathology, Albert Einstein College of Medicine, Yeshiva Univ., Eastchester Rd. and Morris Ave., New York 61.)

(See issue of 16 January for comprehensive list)

23 JANUARY 1959

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■ **SCINTILLATION PROBE** for detection of fast or slow neutrons and gamma and beta radiation uses a ten-stage,  $\frac{3}{4}$ -in. multiplier photo-tube and a transistorized electronic circuit. The unit is water tight and corrosion proof. Resolution time is in the microsecond range. Accessories include a neutron probe 11/32-in. in diameter and three needle probes 2 to 6 mm in diameter. Wall thickness of the latter is 2.5 mil. (Nuclear-Chicago Corp., Dept. 593)

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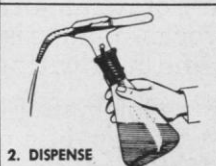
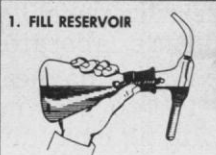
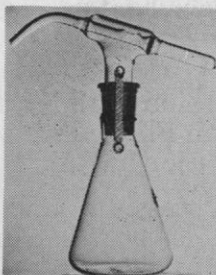
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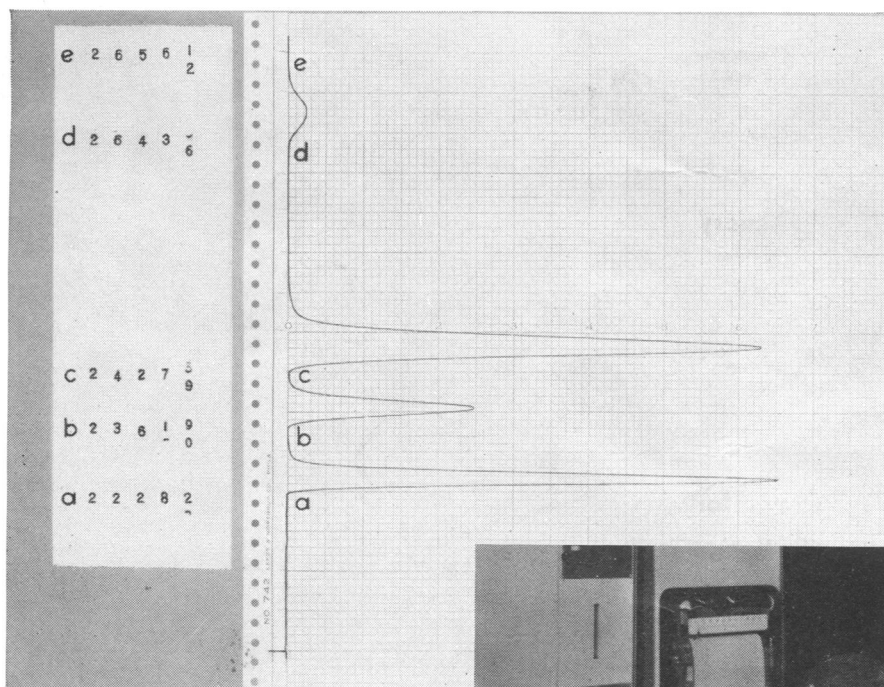


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Fractogram of four-component mixture with integrator tape run in synchronous mode. The synchronous tape feed permits easy identification of integral prints with the corresponding peaks on the fractogram. Corresponding prints and printing points on the fractogram are identified by letters (a, b, c, d and e).

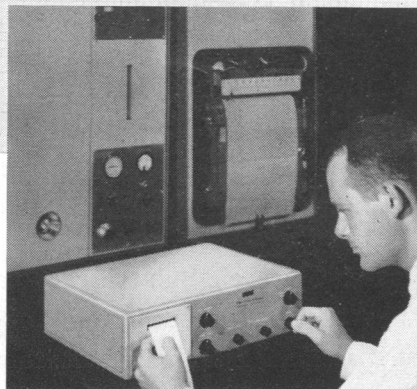
Integrals for each peak are obtained by subtracting the value printed at its leading edge from that printed at the leading edge of the next peak. Thus,  
Propane = (b - a) = 23619 - 22282 = 1337  
Isobutane = (c - b) = 24278 - 23619 = 659  
n-Butane = (d - c) = 26436 - 24278 = 2158  
Isopentane = (e - d) = 26561 - 26436 = 125

Concentrations for each component are computed by dividing the integral for its peak by the total integral (after applying thermal conductivity correction factors if necessary). The complete analysis of this mixture is:  
Propane . . . 31.3%; Isobutane . . . 15.4%;  
n-Butane . . . 50.4%; Isopentane . . . 2.9%.

Up to now, there have been four conventional methods of integrating the areas of peaks produced on a recorder chart by a gas chromatographic analyzer — for example:

**FIRST:** the time-consuming, error-prone approximation of measuring peak height and multiplying by half band width: only as accurate as the analyst's eye and scale at best, not valid for some peak shapes, and requiring a good deal of computation.

**SECOND:** so-called "pip" integration — using an auxiliary pen which dithers along the chart edge as the peak



is recorded and the integrator counts (with each group of ten counts marked by a wider pen swing to facilitate counting). The disadvantages of this technique: low count rate/lower accuracy, with the inherent mechanical difficulties of "pip" recording by pen. You also have to count the pips!

**THIRD:** digital counter read-out — excellent integration, but demanding constant vigilance on the part of the operator to note dial readings at critical moments during peak elution.

**FOURTH:** planimeter area measurement, requiring a steady hand and

virtually infinite patience — and not very accurate, either.

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When the Model 154-C recorder is *attenuating automatically* to keep peaks on scale, the Printing Integrator will follow the recorder through attenuation changes and present compensated integrals at analysis' end.

The peak areas, added and normalized, give gross concentration percentages. Introducing thermal conductivity coefficients, where necessary, will give quantitative measurements six to ten times as precise as pip-marking methods or conventional physical measurement of the chart peaks.

The Model 194 (\$1,375 f.o.b. Norwalk, Conn.) employs a standard velocity servo computer. At full scale, the Integrator produces 6000 counts per minute, or 1263 per square inch of chart space. The recorder pen/count linearity is within  $\pm 0.3\%$ , averaged over full scale.

For more information, write for "Automatic Printed Integration of Recorder Data," to 910 Main Avenue, Norwalk, Conn.

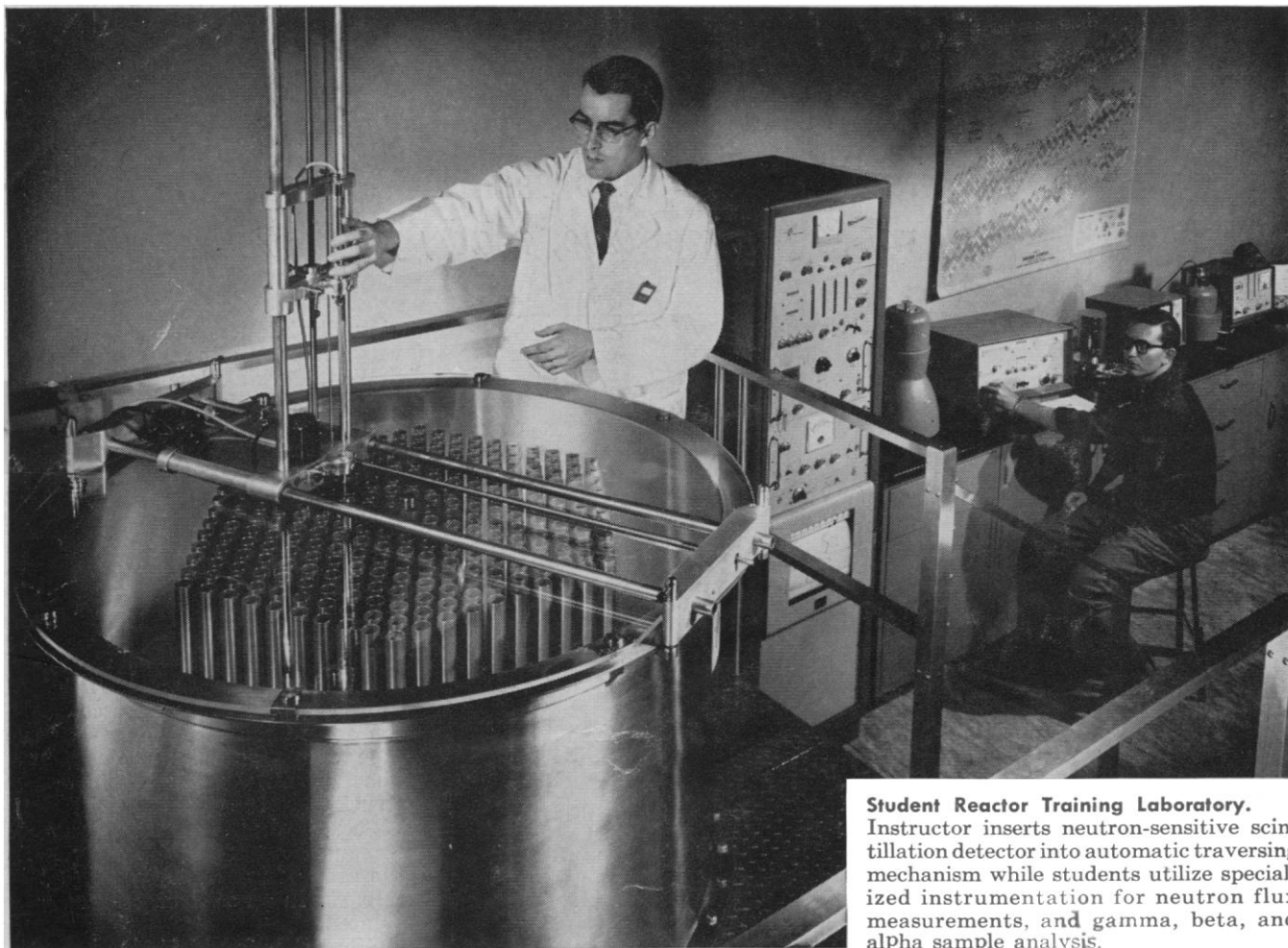
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