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. Daggs, 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)

Equipment

The information reported here is obtained from manufacturers and from other sources considered to be reliable. Science *does not assume responsibility for the accuracy of the information. A coupon for use in making inquiries concerning the items listed appears on page 230.*

■ SCINTILLATION PROBE for detection of fast or slow neutrons and gamma and beta radiation uses a ten-stage, ¾-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)

■ LABORATORY OVEN is designed to be explosion-proof. A dual safety control acts if the master temperature control fails. A limiting control will turn the oven off if a flash fire occurs or if the safety setting is reached. A rear blow-out panel protects personnel. Heaters are totally enclosed, and the interior is automatically ventilated before heaters are energized. Temperatures range up to 260°C and are controlled to ±0.8°C. (Modern Laboratory Equipment Co., Dept. 599)

■ DETECTOR-INTEGRATOR measures random noise over the frequency range 10 cy to kcy/sec with dynamic range better than 50 db. Output is proportional to the average value of the input. Limits of interval of integration from 0.5 to 60 sec can be provided. Output is read on a panel meter. Low-impedance punched-card, punched-tape, or other data-storage outputs are available. (Chesapeake Instrument Corp., Dept. 583)

■ KERR-CELL SHUTTER, for ultrahigh-speed photography, permits incorporation of any exposure time from 0.1 to 0.01 μsec on a particular shutter. The shutter incorporates a Kerr cell 2 in. in diameter, a pulse generator, and a spark-gap device. The unit operates from an external 60-kv source and a low-voltage trigger source. Transmission of the cell is approximately 7 percent, and transmission ratio 20,000 to 1. The cell is hermetically encased. (Avco Manufacturing Corp., Dept. 606)

■ CONDUCTIVITY CELLS for use as laboratory standards against which "working" conductivity cells may be checked are available with cell constants 0.01, 0.1 and 1. They may be used for immersion of flow measurements. (Industrial Instruments, Inc., Dept. 600)

■ HOTPLATE AND MAGNETIC STIRRER combination provides three heat positions and variable stirring. Maximum hot-plate power is 750 w. The plate is designed so that its stainless-steel case remains cool. Teflon stirring bars are supplied. (E. H. Sargent & Co., Dept. 602)

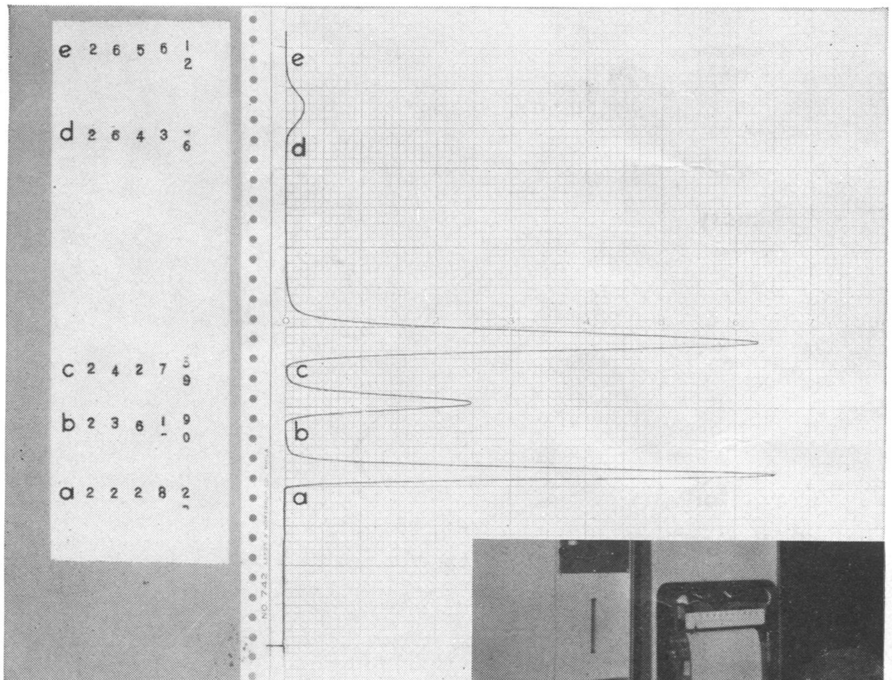
■ CHECK VALVE of silicone rubber is mounted in a standard 1.5-in. needle adaptor to permit administration of drugs, fluids, and gases in cardiovascular and renal studies. The device will open under pressure of less than 6 cm-H_2O and will withstand 500 cm of back pressure. The valve may be autoclaved or sterilized in zephrine. (T. H. Heyer, Dept. 598)

■ PRODUCTION-OPERATIONS RECORDER, operated by electrical impulses from any contact device counts the number of units produced during any preselected time interval. The counts are permanently recorded on punched paper tape suitable for use with automatic data-processing machines. A cumulative total is also presented. Standard time intervals are 5, 15, 30, or 60 min. Other intervals are available. (Fischer and Porter Co., Dept. 608)

JOSHUA STERN
National Bureau of Standards

Now...automatic printed integration of chart peak areas

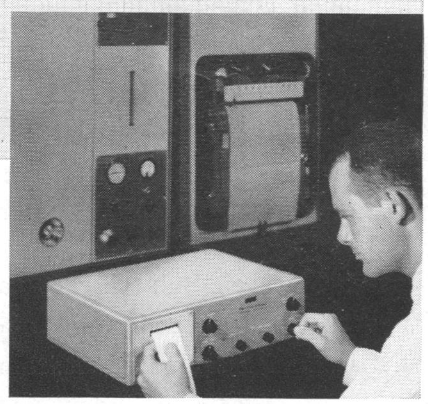
Perkin-Elmer's new Model 194 presents 6000-count/minute integrals on adding machine tape, ready for interpretation



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.

With Perkin-Elmer's new Model 194 Printing Integrator, designed for use with the P-E Model 154-C Vapor Fractometer, integrals are *printed* on standard adding machine tape, automatically at the base of each peak (or manually, on command) and in a variety of modes.

When the recorder pen begins an upscale excursion, a valley sensor in the recorder energizes the printing mechanism, and a five-digit integral is automatically printed on the tape. Tape and recorder chart move at the same speed, making later comparison and identification easy – or the tape can space evenly between prints. The next integral is automatically struck when the pen begins to record the next peak; the difference between this number and the first represents the area of the first peak. The last integral in an analysis is manually printed.

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 ±0.3%, averaged over full scale.

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

Price subject to change without notice.

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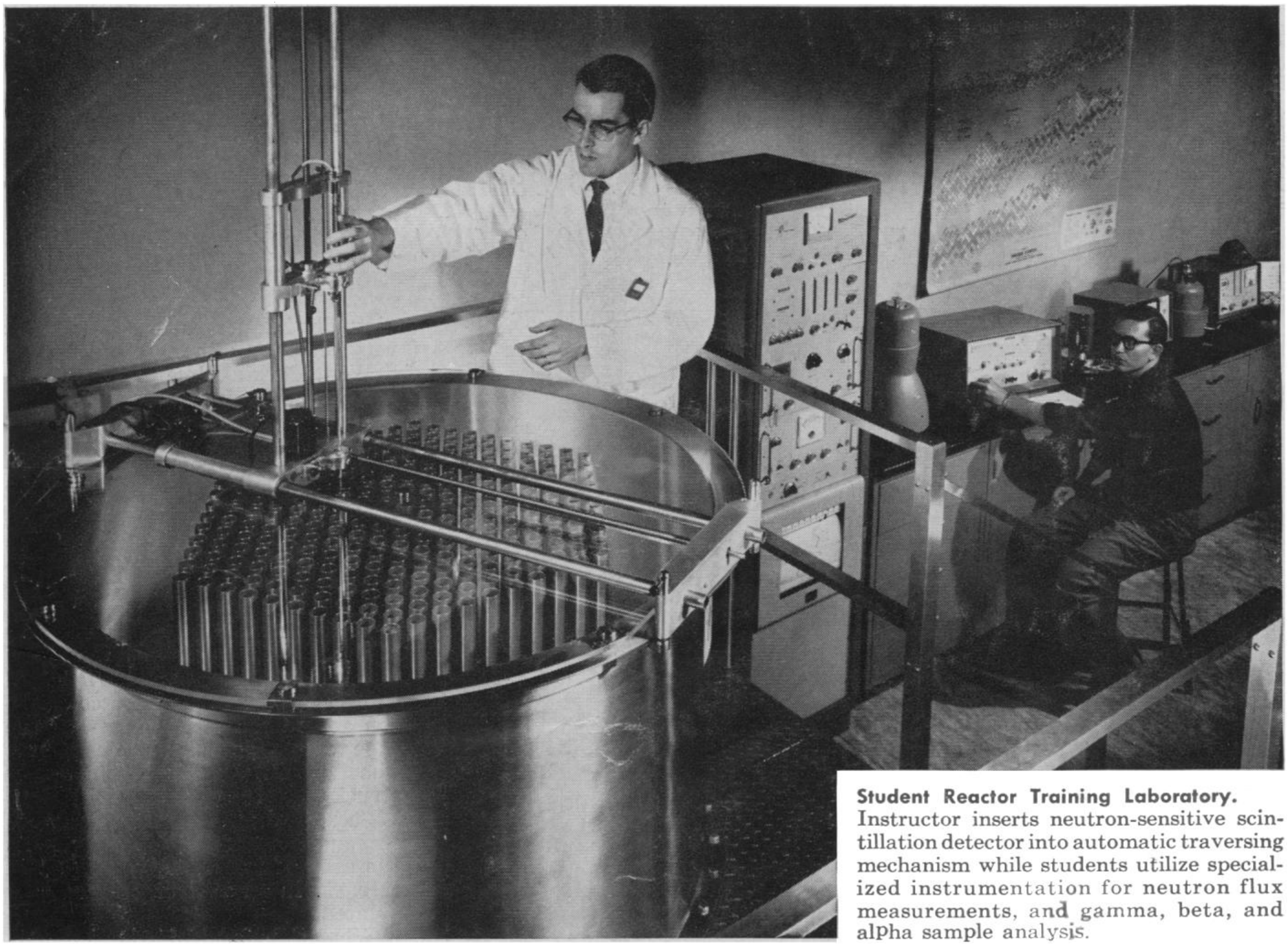

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