

He proposes that gene complexes, associated with each step in development, are activated in a relay-like manner, the determinants being of high specificity and having short ranges of intercellular movement. He believes that growth regulators operate at a less specific level than these determinants because he finds them incapable of changing the course of a developmental sequence already in progress. Regulators can, however, entirely change the path of a sequence, as in changing the development of an appropriate flower from male to female. H. Stern (University of Illinois) cautioned those who speculate on the molecular mechanisms of differentiation about the general lack of facts concerning the inter- or intracellular regulation of metabolic shifts in multicellular organisms. For instance, Stern found in growing plants a species of DNA, of low molecular weight, quite distinct from genetic DNA. It has a high rate of turnover and is particularly active at times of metabolic shifts. This DNA species may represent a mechanism by which multicellular organisms effect gross shifts in metabolism, but it is not represented in any of the current models of such mechanisms.

If, as we believe, growth regulators have highly specific roles in determining plant development, elucidation of the means by which they control development probably awaits the approach to common ground of two lines of investigation—study of the primary reactions of the regulators and study of the molecular mechanisms for regulating metabolism in the cells of higher plants.

#### Note

1. The proceedings of the 5th International Conference on Plant Growth Regulation will be published by the Centre National de la Recherche Scientifique, a sponsoring organization of the conference.

### Forthcoming Events

#### December

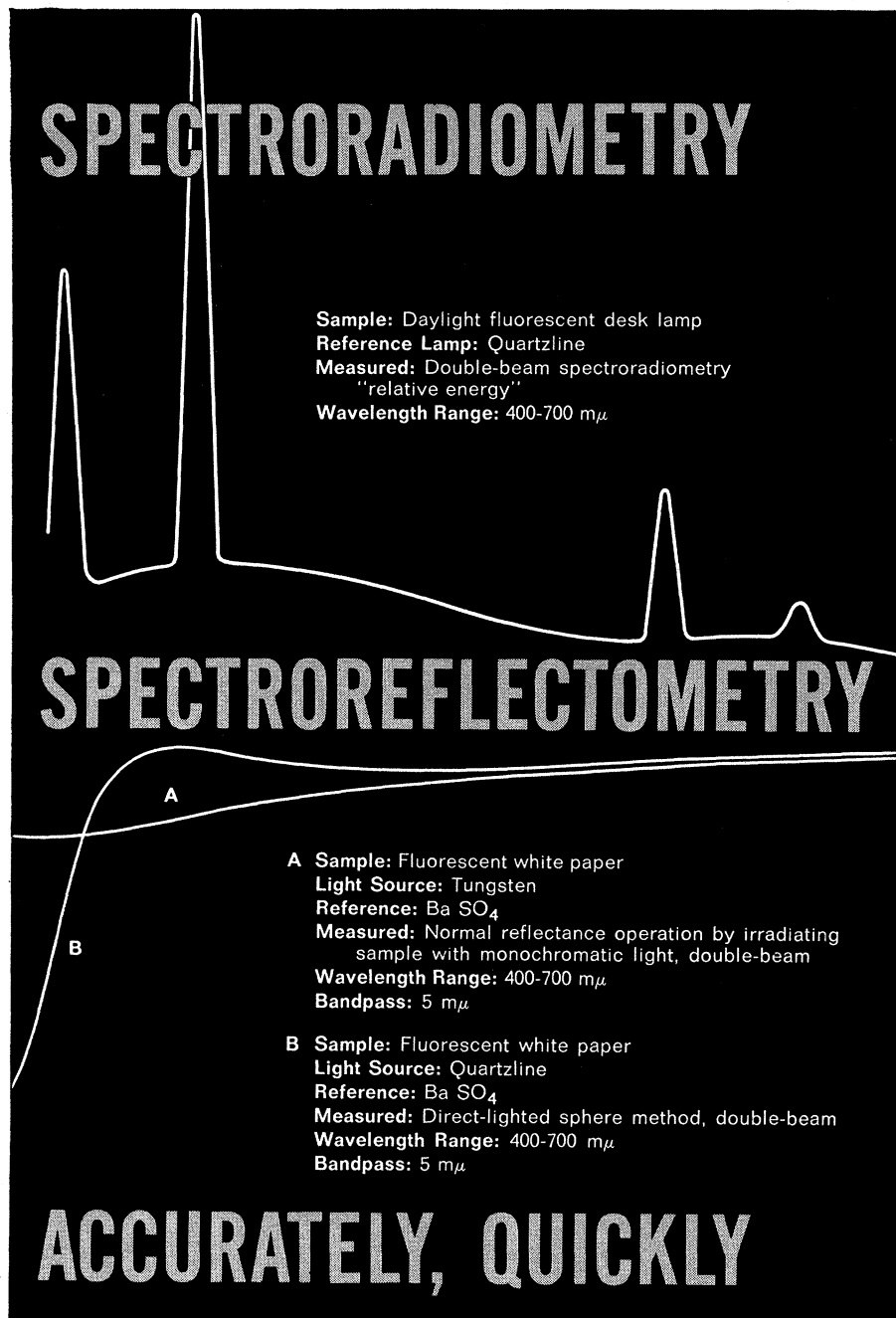
19-20. **Radiation Emergencies** in Medicine, Research and Industry, Chicago, Ill. (R. V. Wheeler, Argonne Natl. Laboratory, 9700 S. Cass Ave., Chicago)

26-28. **American Geophysical Union**, western natl., Boulder, Colo. (W. W. Kellogg, Rand Corp., 1700 Main St., Santa Monica, Calif.)

26-30. **American Assoc. for the Advancement of Science**, Cleveland, Ohio. (R. L. Taylor, AAAS, 1515 Massachusetts Ave., NW, Washington, D.C. 20005)

27-29. **American Economic Assoc.**, Boston, Mass. (H. F. Williamson, AEA, 629 Noyes St., Evanston, Ill.)

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Specific Activity* mc/mM	Prices		
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remaining light repeats the process at each reflection to increase the effect of the absorber many times. The system permits the determination of liquids, waxes, and oils and opaque materials in very thin films or flowing streams.—R.L.B. (Wilks Scientific Corp., Dept. S119, 140 Water St., South Norwalk, Conn.)

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The material in this section is prepared by the following contributing writers:

Robert L. Bowman (R.L.B.), with the assistance of Denis J. Prager (D.J.P.), Laboratory of Technical Development, National Heart Institute, Bethesda 14, Md. (medical electronics and biomedical laboratory equipment).

Joshua Stern (J.S.), Basic Instrumentation Section, National Bureau of Standards, Washington 25, D.C. (physics, computing, electronics, and nuclear equipment).

The information reported here is obtained from manufacturers and from other sources considered to be reliable. Neither *Science* nor the writers assume responsibility for the accuracy of the information.

Address inquiries to the manufacturer, mentioning *Science* and the department number.



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from one in 4 min to one per day, resulting in a total recording time per chart from 160 min to 40 days. A transparent plastic housing displays the entire chart for observation during operation.—J.S. (Henry Troemner, Inc., Dept. S83, 22nd & Master Sts., Philadelphia 21, Pa.)

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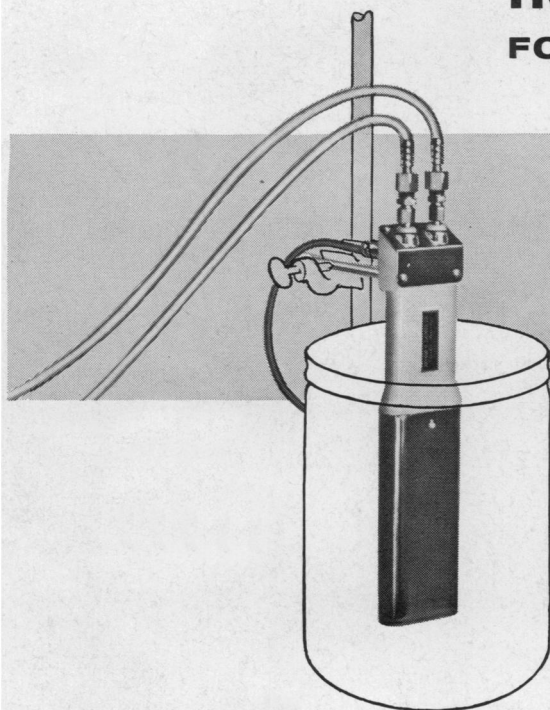


*When Quality is in the Balance!*

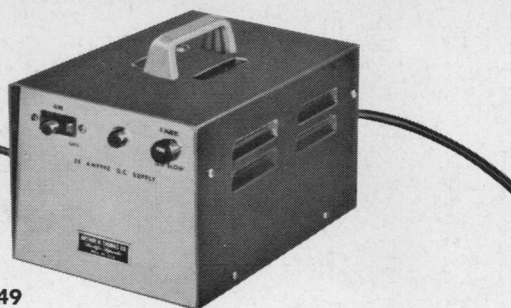


*Thomas* announces the new...

## Whirlpool Thermoelectric IMMERSION COOLER FOR LABORATORY BATHS



- produces sub-zero temperatures
- eliminates rigid coil connections
- compact, silent



4049

**COOLER, IMMERSION, THERMOELECTRIC, Whirlpool.** A Peltier-principle thermal pump for lowering the temperature of laboratory baths. Capable of producing sub-zero temperatures (to  $-25^{\circ}\text{C}$  from  $25^{\circ}\text{C}$  ambient) in bath volumes up to 4 liters in insulated vessels. Can be used in larger baths to provide cooling required to maintain control near ambient temperature. Operates on a 115-volt, 50 or 60 cycle a.c. line, on which the unit draws 165 watts. A slow-flowing source of cooling water at normal temperature is also required.

**Cooling Unit.** Made in the form of a thick nickel-plated copper blade, the cooling surface is 6 inches long  $\times$   $2\frac{3}{4}$  wide  $\times$   $1\frac{1}{8}$  inches thick, providing an effective area of approximately 45 square inches when immersed to recommended depth. Three-pin receptacle for power input and tapped hole for horizontal attachment of  $5\frac{1}{2} \times \frac{3}{8}$ -inch diameter mounting rod are provided in polypropylene shank. Two  $\frac{1}{4}$ -inch o.d. tubulations emerge from top for connection of tubing for cooling water input and discharge. Thermoelectric modules within the outer shell are bonded to a cast bronze heat sink which is cooled by the passage of tap water. A thermal cut-off switch attached to the heat sink closes at  $71^{\circ}\text{C}$  if cooling water is inadvertently shut off (see *Power Supply*).

**Power Supply.** Suitable for unattended, continuous operation to provide 3-volt, 25-ampere d.c. operating power. Contains transformer, two silicon diode rectifiers, choke for reducing output ripple, fuse, pilot lamp and thermal cut-off power switch. Heater in thermal cut-off switch is activated by closure of a bimetal switch attached to the heat sink inside the cooling unit. Although bimetal switch in cooling unit reopens when heat sink temperature drops to  $55^{\circ}\text{C}$ , power will not be restored until power supply switch is reset manually. Plug on d.c. power cable connects the power supply to cooling unit. A.c. input is supplied through a 3-wire cord, with 3-prong plug and adapter.

**Cooling Rate.** Non-linear; depends upon bath volume and temperature of heat sink coolant. In test with 3.5 liters of ethylene glycol, with coolant and initial bath temperature of  $24^{\circ}\text{C}$ , hourly temperatures were recorded as follows: 14, 4,  $-3$ ,  $-8$ ,  $-12$ ,  $-14$ ,  $-16$ ,  $-17$ ,  $-18$ ,  $-19$ ,  $-20$ ,  $-21$ ,  $-22$ ,  $-23$ ,  $-24$  degrees Centigrade.

**4049. THERMOELECTRIC COOLER**, as above described, complete with d.c. power supply unit. .250.00

Bulletin 143, giving detailed information, sent upon request



**ARTHUR H. THOMAS COMPANY**

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