SCIENCE

4 July 1958

Volume 128, Number 3314

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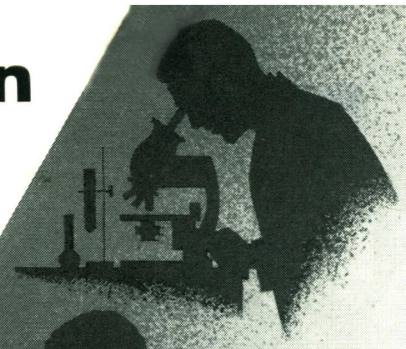

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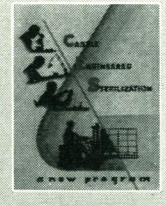

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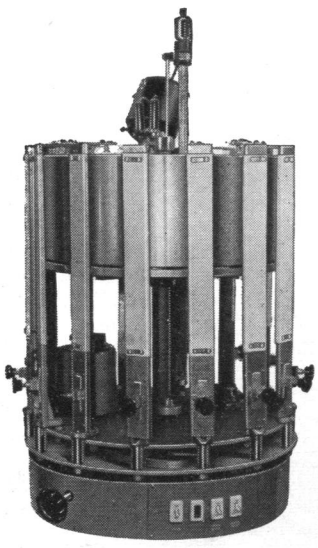

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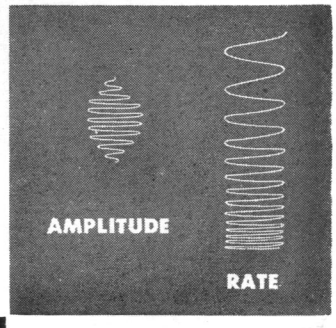

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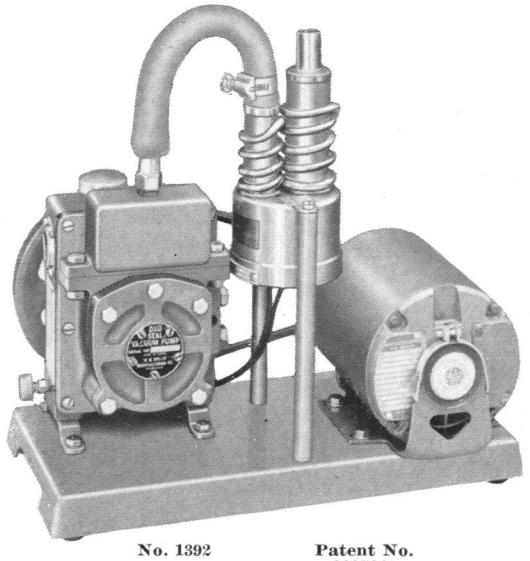

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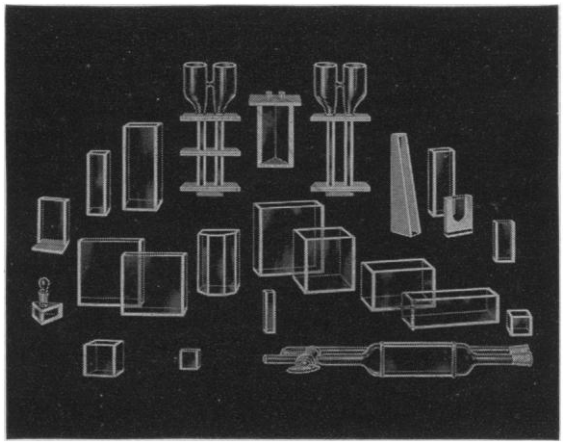

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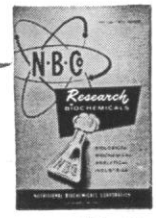

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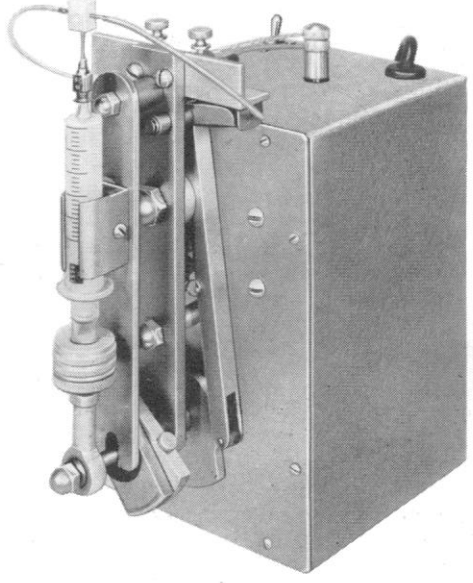

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■ AIRBORNE DIGITAL TAPE RECORDER will record up to 1200 items of data per second. The unit operates for 12 hr, recording seven channels on ½-in. tape at the rate of 1 in. sec and with densities up to 200 pulses per inch. Tape speed is held within ± 2 percent over the drive voltage range of 26 to 32 v. Wow and flutter are approximately 3 percent peak. (Northam Electronics Inc., Dept. 122)

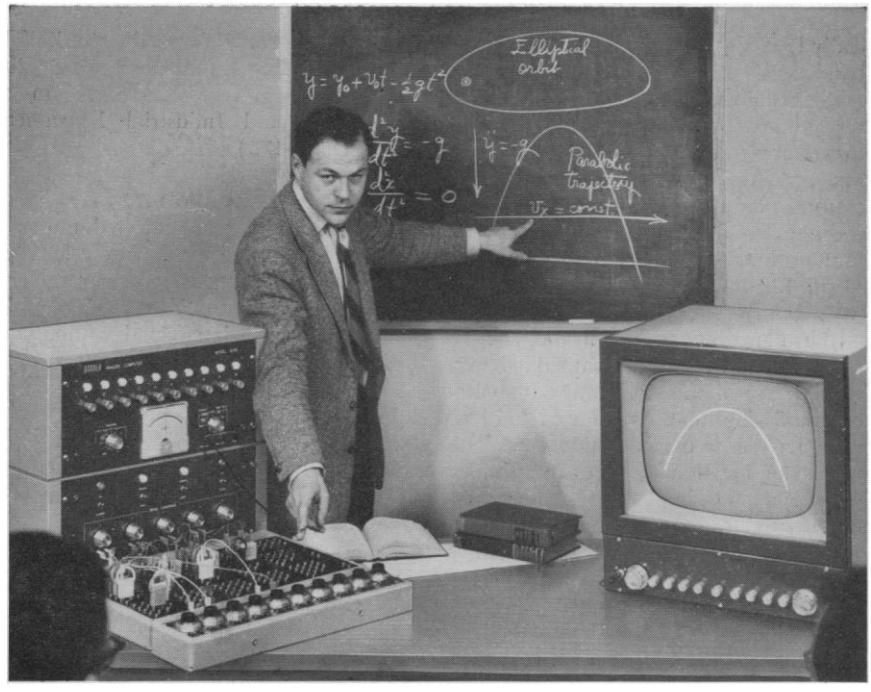
■ TRANSISTORIZED RC TIMERS permit measurements of intervals from 50 msec to several hours. Operation may be on 14 to 32 v d-c or 24 to 220 v a-c. Ambient temperature may range from – 55° to + 125°C. Accuracy of timing is ± 2 percent or better. Volume may be as small as 3 $in.^3$ and weight as little as 3 oz. (Victoreen Instrument Co., Dept. 123)

■ FADING TESTER accelerates the effects of sunlight on materials. Synthetic sunlight is produced by a xenon lamp with suitable filters. Light intensity at the sample is approximately 15000 lu/ft^2. Specimen holders revolve about the light source and may themselves be rotated to simulate a day-night sequence. Up to 20 2-by-4-in. specimens may be accommodated. Temperature is adjustable to 150°F regulated ± 2°F. Humidity is adjustable to 50 percent. (G. F. Bush Associates, Dept. 125)

■ FILAMENT SAMPLE WINDER permits preparation of sample cards of yarns and filaments. Thus measurement of color can be quickly made. Sample deniers can range from 50 to 2500. An automatic counting device permits the operator to preselect the number of layers which will be wound before the winding process automatically stops. (Manufacturer's Engineering and Equipment Corp., Dept. 128)

■ FLATNESS TESTER determines the degree of flatness or conformity of two matching pieces. The unit comprises a vacuum pump and instrument panel with attached testing plate. A sensitive pressure-differential sensing device detects departures from conformity of the mating surfaces. (Gits Bros. Mfg. Co., Dept. 137)

■ INTERFERENCE FILTERS for the ultraviolet spectral region from 310 to 389 mμ have transmission bands of half-value width of about 10 mμ. Spectral background in the visible region is kept espe-



Free Fall Trajectory of a Projectile in Earth's Gravitational Field.

The equations for a parabolic trajectory shown on the blackboard follow from Newton's Laws of Motion for objects near the earth where linear dimensions of the path are negligible by comparison to earth's radius. Such a parabolic path is generated by the Donner 3000 Analog Computer, and shown as an oscilloscope trace. Angle of elevation, initial velocity, initial displacement, and magnitude of gravity may be introduced and changed arbitrarily by potentiometer settings. The computer is also appropriate for study of Kepler's Laws of planetary motion. An example of current interest is the study of earth satellite orbits.

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cially low. Two grades are available with band center held within ± 5 mμ and ± 2 mμ of nominal, respectively. For the better grade, variation of wavelength of maximum transmission is less than ± 2 mμ over the filter surface. Maximum transmission averages 30 percent. Standard sizes are 50 mm in diameter or 50.8 mm square. (Fish-Schurman Corp., Dept. 126)

■ HIGH-SPEED SWITCHING DEVICE consists of a multitude of wires embedded in a special face plate sealed to the funnel of a cathode-ray tube. As many as 256 lead wires have been placed within 4 in². Tolerance of location of wires in specified areas is ± 0.005 in. The use of the cathode ray to effect connection to a particular lead permits very high switching speeds. (Corning Glass Works, Dept. 129)

■ THICKNESS METER for tin coatings operates on a coulometric principle. Tin-coated samples are immersed in electrolyte contained in a cell which also holds cathodes and a reference electrode. A meter connected to the reference electrode indicates progress of the electrolysis. The meter is arrested when dissolution of free tin is complete. A second arrest of the meter occurs when tin-iron alloy has completely dissolved. The weights of free tin and of tin-iron alloy are read from the scales of the meter. (Research and Industrial Instruments Co., Dept. 133)

■ METABOLIC SHAKING INCUBATOR incorporates a governor-controlled motor to ensure constant operation over long periods of time. Shake-frequency range is 25 to 140 cy/min with 1½-in. stroke. Change of rate is effected without mechanical change-over by adjustment of a knob. (Precision Scientific Co., Dept. 140)

■ FLUTTER METER measures flutter and wow in tape-recording and play-back equipment. A 3000 cy/sec oscillator is incorporated for recording. A three-range filter isolates flutter and wow components for study. These ranges are 0.5 to 6 cy/sec for wow, 5 to 250 cy/sec for flutter, and a combination of the two. The root-mean-square value of flutter components is read on a calibrated meter. (Amplifier Corporation of America, Dept. 139)

■ BINARY TIMER provides 128 binary counts at a continuous rate of one per second. Each second of time is marked by a synchronizing commutator pulse that is followed by an identifying eight-bit binary encoded train of pulses. Repetitive cycles of 128 bits can be recognized by a counter. The timer consists of a commutator and brush assembly with low-inertia code drums driven by a 28-v d-c motor. Decimal and other codes are available on special order. (Instrument Development Laboratories, Inc., Dept. 136)

■ PULSE ANALYZER uses mechanical scanning of a single-channel analyzer to measure gamma-ray spectra automatically. Five scanning speeds are selectable. Scanning limits may be set in multiples of 5 percent of the total range. Two modes of operation provide a single scan or reset and repetitive scan. Provision is made to operate a 10-mv or a 1-ma recorder. (B. J. Electronics, Dept. 147)

■ RANDOM-ACCESS MEMORY is a magnetic-tape transport mechanism with storage capacity up to 10 million bits. Each of two reels carries approximately 35 ft of 1-in. tape which can be swept past the head in either direction in less than ½ sec. Drive and programing circuits are completely transistorized. The memory can be programed to return to center after each search or can be stopped at

THE SPECIES PROBLEM

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The symposium was arranged by the Association of Southeastern Biologists and cosponsored by AAAS Sections F and G, as well as four other societies. Most papers are published essentially as given in Atlanta in December 1955. Dr. T. M. Sonneborn, however, undertook a comprehensive survey of the species problem in the protozoans and particularly in the ciliates. His masterly synthesis comprising more than two-fifths of the volume is a fundamental contribution to the protozoan literature.

This symposium made a solid contribution toward the solution of the species problem. It broadened the base on which to discuss the problem by utilizing new organisms. It led to a clarification of the areas of general agreement among biologists. It presented a clear statement of the various species concepts and frankly stated and enumerated difficulties in their application to different types of natural populations. Finally, it illuminated certain aspects of the ageless species problem that had been neglected previously, and it attempted a statement of still controversial issues. From these papers it should be evident that the species problem is still one of the important issues in biology.

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M. J. Coon and W. G. Robinson
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L. A. Heppel and J. C. Rabinowitz
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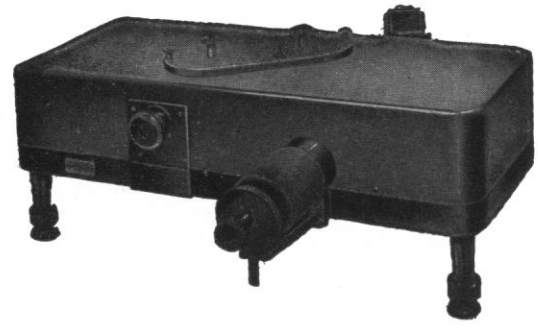

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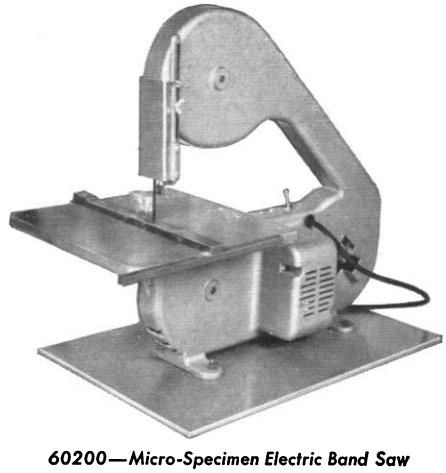

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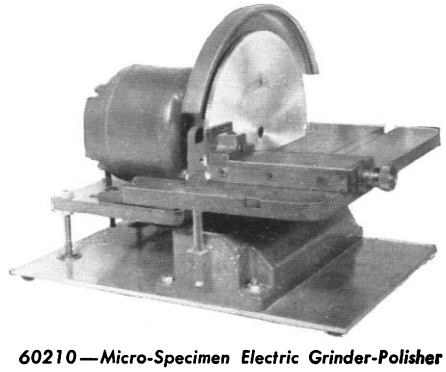

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■ FREEZING UNIT for tissue specimens uses compressed Freon-12 to maintain temperature constant at approximately –30°F. Microtomes attach to the front plate of the device. The equipment is readied for use by turning on compressor standby switch in the morning. Standby power consumption is 50 w. (Scientific Products, Dept. 115)

■ SAMPLE COATER for laboratory study of painting materials operates on the timed-withdrawal principle. Withdrawal is accomplished by allowing the paint to drain by gravity flow from a tank suspending the samples to a second tank. Rate of withdrawal is controlled by valve adjustment. Tanks are raised and lowered by hand crank. (Gardner Laboratory Inc., Dept. 146)

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■ ION CHAMBERS are designed for operation at temperatures up to 300°C. Available are compensated and uncompensated neutron-sensitive chambers, gamma-sensitive chambers, fission counters, and proportional counters for neutron-flux charges from 10^{-1} to 10^{11} NV. All are sealed-chamber units. The compensated chambers have a fixed geometrical compensation exceeding 95 percent. (General Electric, Dept. 121)

■ INCUBATOR provides visibility of every vessel inside without opening door. The incubator chamber, a cylinder 10 in. long and 14½ in. in diameter cylinder, has four shelves. (Central Scientific Co., Dept. 152)

■ STRIP-CHART RECORDERS are available in a variety of widths and with a variety of movements. Recording is rectilinear and direct writing in both inkless and inking models. D'Arsonval movement is used for direct current; a rectifier is provided for alternating current. Dynamometer movements are used for ac r.m.s. The standard size has a chart width of 4-11/16 in. and accommodates up to three channels. Six chart speeds are selectable. (Curtiss-Wright Corp. Dept. 149)

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