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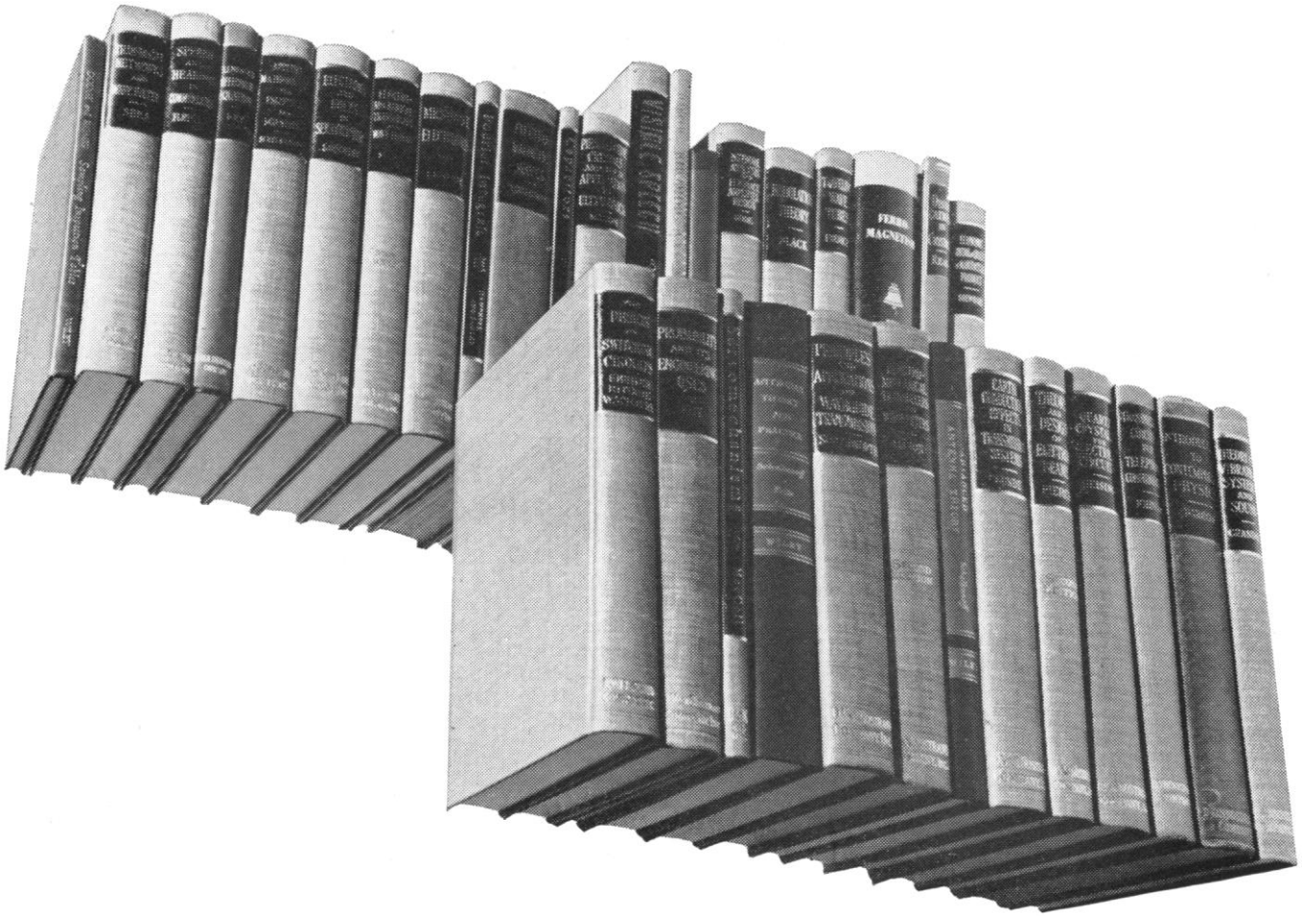

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Walter A. Shewhart, Ph.D., University of California, author of "Economic Control of Quality of Manufactured Product."

manifest his difficulties may not be a function of his physiological status." Certainly in psychiatry there is a wide divergence of opinion whether schizophrenia is a single entity or whether it is a disease characterized by the uniqueness of the individual or a reaction formation. To the psychiatrist, each patient is unique. But this has little bearing on the problem whether a single biochemical factor is present.

Horwitt has recognized this by his statement that it "may not" be a function of his physiological status—conversely it "may." In medicine, it is not at all unusual to find that diseases with fairly simple biochemical defects express themselves in terms of personality in unique ways. I am convinced that, if the factors of hyperthyroidism were unknown today, we would argue about it in the same way. During the latter part of the last century, there were many passionate arguments regarding the causes of paresis.

I am disturbed at the expression "the patient chooses to manifest." This implies again the entire concept of reaction formation with subconscious selection of the type of reaction. Apparently, Horwitt uses psychiatric hypothesis as fact when it may in fact be artifact [P. Bailey, *Am. J. Psychiat.* **113**, 387 (1956)].

The first recommendation that estimation of tension and anxiety be made would be useful if this were possible. I have searched in vain for a test that will reliably measure this variable. One can often decide whether a person is anxious or not. To quantify this will be a major achievement. To ask one to measure a variable without telling him which measure to use is the counsel of futility. The second recommendation, that no research be done until patients have balanced at least 3 months, removes pretty effectively from biochemistry the vast majority of acute schizophrenics, leaving a residue of chronic hospitalized patients. Perhaps this is desirable, but one should know clearly the result of one's recommendation.

Finally, regarding urine collections, overnight samples from patients and controls may lead to erroneous conclusions. I fear that 24-hour samples will do the same. One ought to combine the best of both methods and make measurements on urine collected at given intervals over the 24-hour period.

Finally, in contrast to Horwitt's, it is my belief that psychiatrists use too freely the concept of cause and effect and that biochemists usually are not preoccupied with these matters. This falls within the realm of philosophy. Writing about Galileo, Newman states: "As we read his writings we instinctively feel at home: we know that we have reached the method of physical science which is still in use. Galileo's primary interest was to discover 'how' rather than 'why' things work" [J. R. Newman, *The World of Mathematics* (Simon and Schuster, New York, 1956), vol. 2, p. 726]. Science deals with the rational explanation of observable phenomena. In the area of schizophrenia, it is of no utility to discover what may be the cause—there are undoubtedly many "causes." We are concerned with the factors that transform a set of causes into a set of clinical symptoms and signs. In medicine, we do not treat causes—we treat those variables most easily modified, and these may be physiological, psychological, electric, or combinations of these.

The paper by Horwitt will make many biochemists aware of controllable factors which they should have learned in college. But the biochemist must not be seduced by analytic dogma that depends solely on the word of the master. In psychiatry today we need more of the cold breath of reason.

A. HOFFER
University Hospital, Saskatoon, Saskatchewan

I am pleased by A. Hoffer's reaction to my article "Fact and artifact in the biology of schizophrenia"; after 20 years of close association with psychiatrists and their patients, one learns to recognize defensive reactions.

As for the particulars with which Hoffer chose to disagree, I am sure that they are less important than the generalization that too many papers are published in this field which do not meet the accepted standards of the scientific method. It is time that some biologists (including psychiatrists attempting to be biochemists and biochemists attempting to be psychiatrists) stop beclouding the literature with reports of poorly controlled experiments that often catalyze extensive and expensive reinvestigations, because the factors of stress, nutritional state, relative physical activity, and of liver function are not controlled. Some day it will be possible to differentiate with greater accuracy the stresses of schizophrenia from those of other diseases by means of biochemistry. This day will come sooner if we improve our methods of controlling the variables under discussion.

M. K. HORWITT
Elgin State Hospital, Elgin, Illinois

No Visa Difficulties

In confirmation of Walter M. Rudolph's letter to Thomas J. Killian, quoted in the editorial "Scotching a damaging rumor" [*Science* **125**, 7 (4 Jan. 1957)], I should like to report that at least six (Western) European scientists who had made one or more visits to Rus-

sia or the satellite countries during 1954 and 1955 were admitted to our country in August 1956 to attend the meetings of the sixth Congress of the International Society of Hematology. These six individuals had all been concerned regarding possible difficulty in obtaining visas for our country, but no such difficulties materialized. The various people in the State Department (including Rudolph) were very helpful. The entrance of these and of 17 "Iron Curtain" delegates was facilitated by recourse to the Exchange Visitors Program, a mechanism which seems to be of considerable value for the entrance of foreign scientists to our country for international gatherings.

WILLIAM DAMESHEK
New England Center Hospital, Boston, Massachusetts

EQUIPMENT NEWS

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. All inquiries concerning items listed should be addressed to* Science, *Room 740, 11 W. 42 St., New York 36, N.Y. Include the name(s) of the manufacturer(s) and the department number(s).*

■ BOTTLE ROTATOR-OSCILLATOR accommodates 20 32-oz test bottles simultaneously. The unit measures 49 by 10 by 14 in. and weighs 75 lb. Bottles are held in place by individually hinged, spring-loaded clips. One model oscillates through 90 deg; another through 360 deg. (Labline, Inc., Dept. S196)

■ AREA MONITOR incorporating a 3-cycle logarithmic count-rate meter is available with either a beta-gamma sensitive GM probe or with a gamma-sensitive scintillation probe. Visual and audible alarms are provided. A calibrated radioactive test sample and a 3600 cy/min test signal are included. Range is 50 to 50,000 count/min. (Nuclear Measurements Corp., Dept. S170)

■ RECORDING ELLIPSOMETER permits the measurement and recording of changes of thickness of very thin transparent films on a flat metal mirror. The instrument is based on the functional relationship between ellipticity of reflected polarized light and the thickness of the film. Monomolecular layers may be studied in this way. Sensitivity is better than 0.5 A in the most sensitive thickness range. For materials of refractive index near 1.5, this range is at a thickness of approximately 1000 A. To bring observations into this range, the metal reflecting surface is first coated with a suitable background material. (O. C. Rudolph and Sons, Dept. S175)

■ *p*H METER model 85 is a line-operated instrument said to have an accuracy of 0.1 *p*H unit. Range is 0 to 14 without switching. Either a combination glass and calomel electrode or separate electrodes are furnished. (Photovolt Corp., Dept. S187)

■ SURFACE TEMPERATURE is measured by a tape-resistor temperature-sensing element, 1/4 in. by 5/16 in., which is applied by pressing onto the surface. These resistors, available in ranges from −300° to 400°F, furnish up to 5 v output without amplification. Accuracy is ±2 percent of full scale, and precision is ±0.5 percent of full scale. (Trans-Sonics, Inc., Dept. S178)

■ ORGANIC CHEMICALS made by Matheson, Coleman and Bell and available for immediate delivery are listed in a catalog. (Chicago Apparatus Co., Dept. S179)

■ MAXIMUM-MINIMUM THERMOMETERS of stainless steel are of direct-drive, bimetallic type. Two ancillary pointers that can be set against the high and low sides of the indicating pointer move with the pointer in each direction, remaining at the maximum and minimum readings until reset. The setting knob is hermetically sealed through the glass window. (Pacific Transducer Corp., Dept. S182)

■ VACUUM FURNACE can be used for melting, annealing, brazing, sintering, and degassing. The model F-1212 accommodates a 3- by 6-in. zirconia crucible and provides temperatures to 2000°C. The vacuum system includes a

4-in., 320-lit/sec diffusion pump with a liquid-nitrogen cold trap. A combination thermocouple-ionization gage measures the vacuum. (High Vacuum Equipment Corp., Dept. S184)

■ STEREO MICROSCOPE uses 8× Kellner eyepieces and two sets of objectives on a revolving turret to provide magnifications of 21 and 34. Working distance is up to 3 in. (Edmund Scientific Co., Dept. S181)

■ ISOLATED WORK SPACE 3 ft long, 2 ft high, and 28 in. deep is provided by a chamber that has its own air supply, exhaust system, and services. Unit can be used closed or open. (Fisher Scientific Co., Dept. S183)

■ POWER SUPPLY for transistor work furnishes 0 to 50 v d-c (continuously variable) at current of 0 to 1000 ma, as well as 6.3 v a-c at 10 amp. Change of input voltage from 105 to 125 v results in 0.1 percent change in output voltage. Ripple is 3 mv r.m.s. for 50 v, 1000 ma output, and regulation at the same output is 80 mv, no load to full load. Output voltage is set by a three-turn Helipot. (Dressen-Barnes Corp., Dept. S185)

■ NEEDLE CLEANER cleans 1 to 36 needles collected from used Vacutainers. Connection to filter pump draws detergent, water, and disinfectant through needles. (American Hospital Supply Corp., Dept. S186)

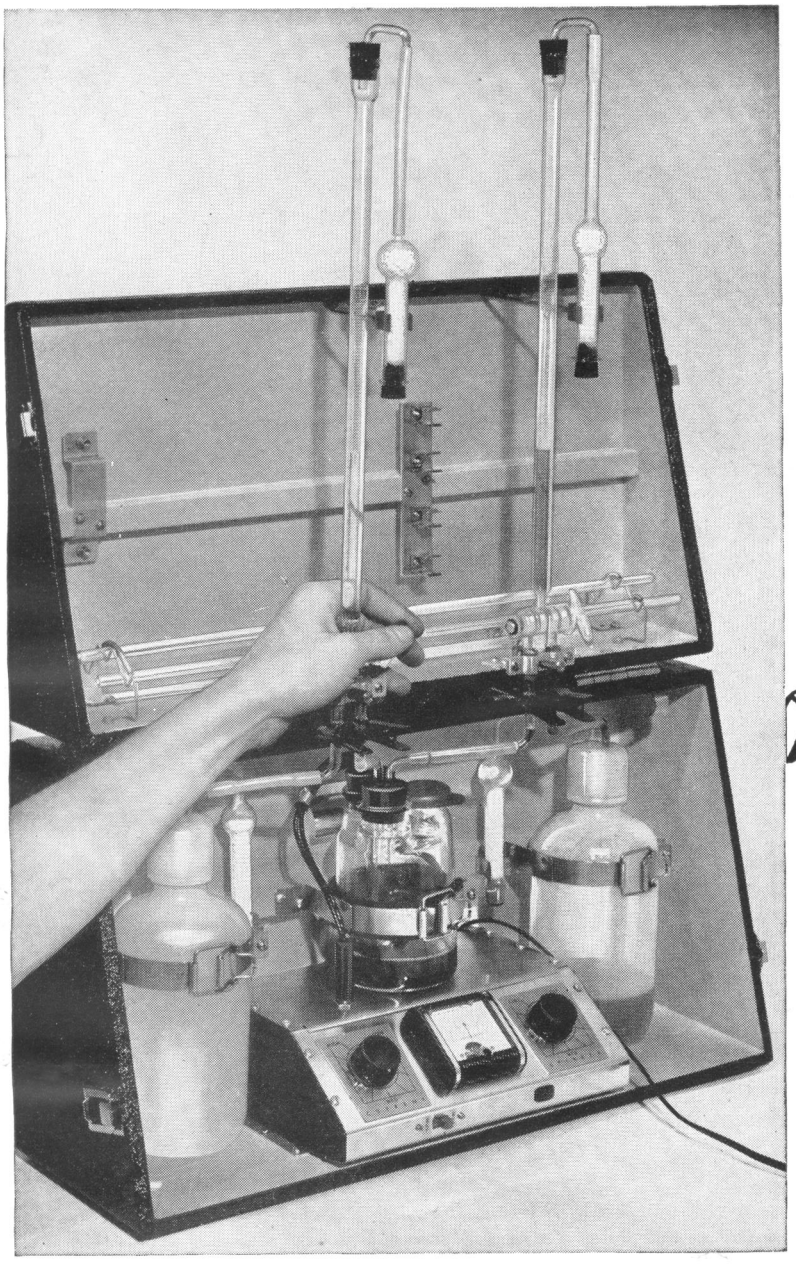
■ ACTIVITY METER for quantitative recording of motor activity in rats and mice consists of a photoelectric sensing chamber that operates a remote counting unit for registering the animal's movements. (Metro Industries, Dept. S188)

■ GLASS FRACTIONATING COLUMNS and auxiliaries are described in an 8-page catalog. (Glass Engineering Laboratories, Dept. S190)

■ GAS STERILIZER uses a mixture of ethylene oxide, carbon dioxide, and water vapor to sterilize temperature-sensitive objects. Gas is introduced after evacuation of sterilization chamber and is removed by evacuation. Factors of time, temperature, humidity, and gas concentration are automatically controlled. A typical cycle is 4 hr at 130°F. (Wilmot Castle Co., Dept. S191)

■ RECORDER permits 400 linear inches of on-off information to be noted on a 6- by 14-in. chart. The record is made as a spiral trace on a drum-supported, wax-paper chart. Drum periods from 4 min to 24 hr can be furnished. (Gorrell and Gorrell, Dept. S193)

JOSHUA STERN
National Bureau of Standards



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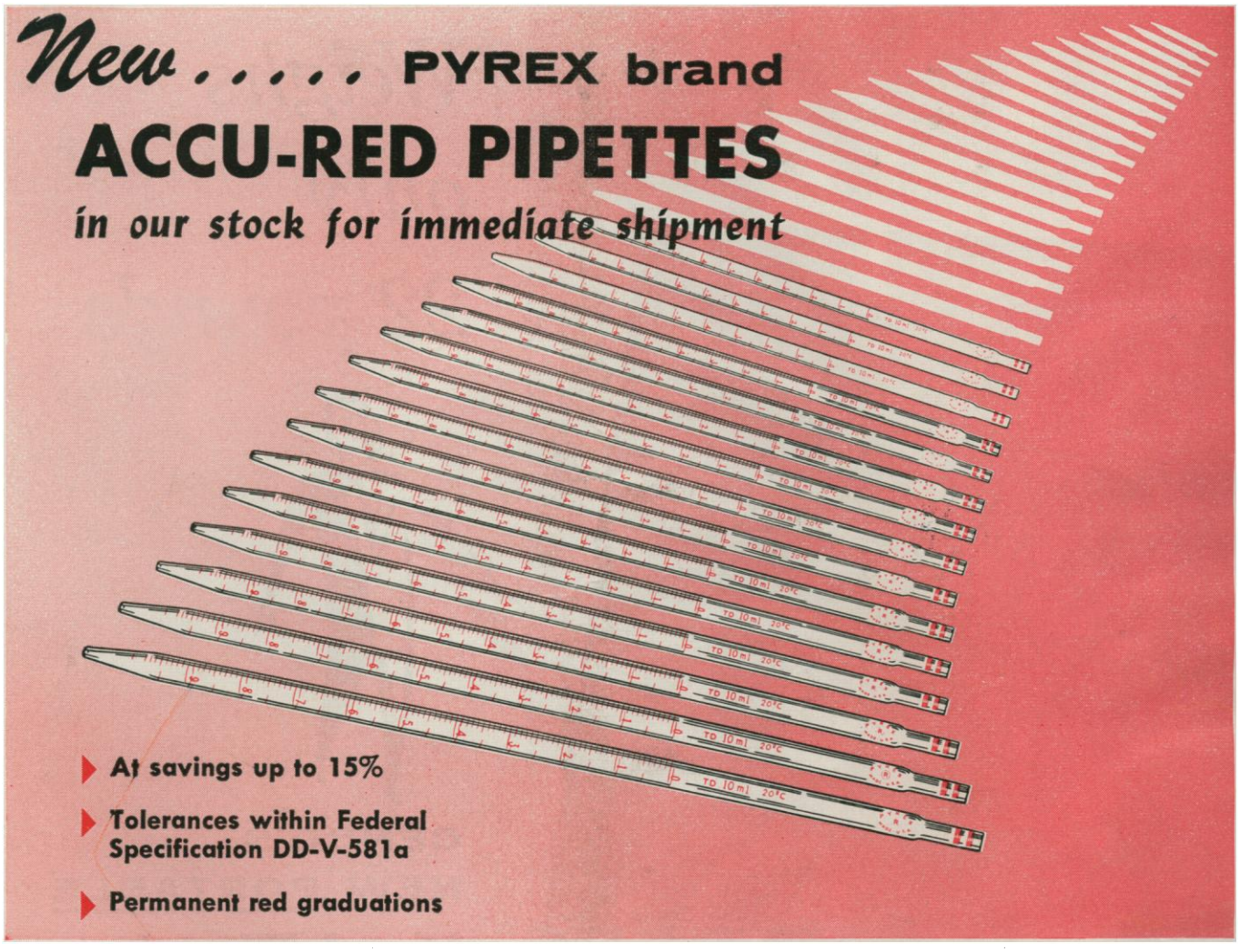

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These new Pipettes have an accuracy well within the requirements of Federal Specification DD-V-581a. Calibrating and marking by one operation reduces the cost and results in savings up to 15%.

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To deliver, ml.....	1	1	2	5	10	25
Graduation interval, ml.....	1/10	1/100	1/10	1/10	1/10	1/10
Tolerance, ±ml.....	0.02	0.02	0.02	0.04	0.06	0.10
Each.....	**1.03**	**1.14**	**1.16**	**1.16**	**1.34**	**1.81**
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8169-L. Pipettes, Serological, Accu-red, Pyrex brand glass, graduated to extreme tip; with two bands at top indicating they are calibrated for blowing out the last drop.

To deliver, ml.....	1	1	2	5	10
Graduation interval, ml.....	1/10	1/100	1/10	1/10	1/10
Tolerance, ±ml.....	0.02	0.02	0.02	0.04	0.06
Each.....	**1.08**	**1.23**	**1.26**	**1.26**	**1.49**
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