

Vocational Service of Greater Boston, 70 Franklin St., Boston 10, Mass.)

21-28. Neurological Sciences, 1st internatl. cong., Brussels, Belgium. (P. Bailey, National Institutes of Health, Bethesda 14, Md.)

23-24. Modern Electrochemical Methods of Analysis, Internatl. symp., Paris, France. (G. Charles, Ecole Supérieure de Physique et de Chimie, 10, rue Vauquelin, Paris 5°.)

25-26. Structure Properties Relationships of Polymers (IUPAC), Paris, France. (International Union of Pure and Applied Chemistry, 4, Avenue de l'Observatoire, Paris 6°.)

25-29. Protein Chemistry Symp., IUPAC, Paris, France. (J. Roche, College de France, Place Marcellin Berthelot, Paris 5°.)

26-27. Experimental Psychology and Animal Behavior Section of International Union of Biology, Brussels, Belgium. (H. S. Langfeld, Dept. of Psychology, Princeton Univ., Princeton, N.J.)

26-27. Linguistic Soc. of America, Ann Arbor, Mich. (A. A. Hill, Box 7790, University Station, Austin 12, Tex.)

26-27. Military Psychology, internatl. symp., Brussels, Belgium. (National Academy of Sciences, 2101 Constitution Ave., NW, Washington 25.)

26-31. International Humanist and Ethical Union, 2nd cong., London, England. (American Humanist Assoc., Gate House, Yellow Springs, Ohio.)

26-1. International Congress on Nutrition, 4th, Paris, France. (Quatrième Congrès International de Nutrition, CNERNA, 71, boulevard Péreire, Paris 17°.)

27-3. Religion in the Age of Science, 4th annual, Star Island, Isles of Shoals, Portsmouth, N.H. (Mrs. R. Holt, Box 156, Pennington, N.J.)

28-1. Psychoanalysis, 20th internatl. cong., Paris, France. (Dr. Nacht, 187, rue Saint-Jacques, Paris 5.)

28-3. Psychology, 15th internatl. cong., Brussels, Belgium. (L. Delys, 296, avenue des Sept Bonniers, Forest-Bruxelles.)

31-5. International Assoc. for Hydraulic Research, Lisbon, Portugal. (M. Coelho Mendes da Rocha, Laboratorio Nacional de Engenharia Civil, Avenida do Brasil, Lisbon.)

31-6. Dermatology, 11th internatl. cong., Stockholm, Sweden. (C. H. Floeden, Hudkliniken, Karolinska Sjukhuset, Stockholm 60.)

August

2-3. Pennsylvania Acad. of Science, Honesdale, Pa. (K. Dearolf, Public Museum and Art Gallery, Reading, Pa.)

5-11. Pan American Cong. of Pediatrics, 5th, Lima, Peru. (C. F. Krumdieck, Washington 914, Lima.)

5-17. Curare and Curare-Like Agents, internatl. symp., Rio de Janeiro, Brazil. (C. Chagas, Instituto de Biofisica, Universidade do Brasil, 458 Avenida Pasteur, Rio de Janeiro.)

6-9. Poultry Science Assoc., annual, Columbia, Mo. (C. B. Ryan, Texas A&M. College, College Station.)

7-9. Industrial Applications of X-Ray Analysis, 6th annual conf., Denver, Colo. (J. P. Blackledge, Metallurgy Div., Denver Research Inst., Univ. of Denver, Denver 10.)

7-9. International Union against the Venereal Diseases and the Treponematoses, 31st general assembly, Stockholm, Sweden. (Secretary General, Institut Alfred Fournier, 25, boulevard Saint-Jacques, Paris 14°, France.)

8-15. International Statistical Inst., 30th, Stockholm, Sweden. (Secretary General, ISI 30th Session, Fack, Stockholm 5.)

8-15. International Union for the Scientific Study of Population, Stockholm, Sweden. (F. Lorimer, c/o American University, Washington 16.)

11-14. Heat Transfer, national conf., University Park, Pa. (G. M. Dushinberre, Pennsylvania State Univ., University Park.)

11-17. World Federation for Mental Health, 10th annual, Copenhagen, Denmark. (Miss E. M. Thornton, 19 Manchester St., London, W.1, England.)

12-16. Canadian Teachers' Federation, annual, Edmonton, Alberta, Canada. (G. G. Crookery, 444 MacLaren St., Ottawa 4, Ont.)

12-18. Theory of Functions, internatl. colloquium, Helsinki, Finland. (B. Eck-



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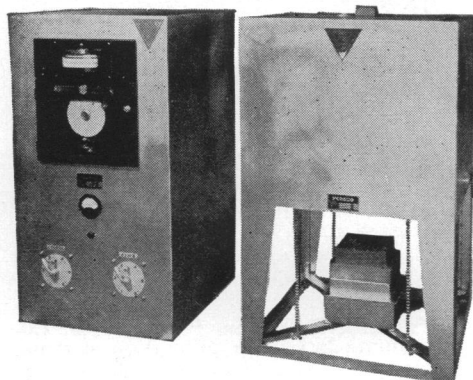
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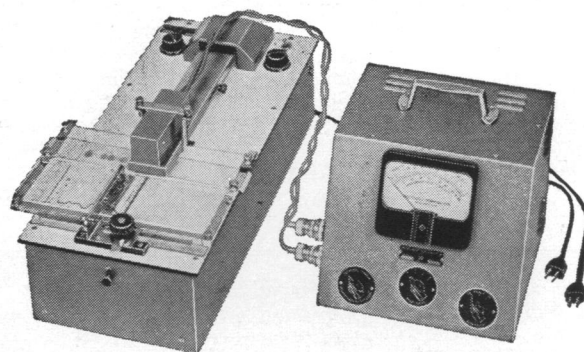
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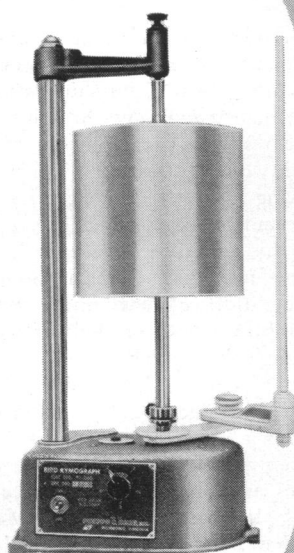
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mann, Ecole Polytechnique, Federale, Zurich, Switzerland.)

12-25. International Soc. of Soil Mechanics and Foundation Engineering, 4th Conf., London, England. (A. Banister, Institution of Civil Engineers, Great George St., London, S.W.1.)

18-21. American Astronomical Soc., Urbana, Ill. (J. A. Hynek, Smithsonian Astrophysical Observatory, 60 Garden St., Cambridge 38, Mass.)

19-21. National Council of Teachers of Mathematics, Northfield, Minn. (M. H. Ahrendt, NCTM, 1201 16 St., NW, Washington 6.)

19-22. American Veterinary Medical Assoc., annual, Cleveland, Ohio. (J. G.

Hardenbergh, AVMA, 600 S. Michigan Ave., Chicago 5, Ill.)

19-23. Clay Conf., 6th natl., Berkeley, Calif. (Dept. of Conferences and Special Activities, Univ. of California Extension, Berkeley 4.)

19-23. Clinical Chemistry, 2nd international European cong., Stockholm, Sweden. (K. Agner, Box 12024, Stockholm 12.)

19-24. Finite Groups, internatl. colloquium, Tübingen, Germany. (H. Wielandt, Faculty of Mathematics and Natural Science, Eberhard-Karls-Universität, Tübingen.)

(See issue of 17 May for comprehensive list)

LETTERS

The editors take no responsibility for the content of the letters published in this section. Anonymous letters will not be considered. Letters intended for publication should be typewritten double-spaced and submitted in duplicate. A letter writer should indicate clearly whether or not his letter is submitted for publication. For additional information, see Science 124, 249 (1956) and 125, 16 (4 Jan. 1957).

Literature, Science, Manpower Crisis

Unusual importance attaches to the article on "Literature, science, and the manpower crisis" by Joseph Gallant [*Science* 125, 787 (26 Apr. 1957)]. If it could be read by all those who are engaged in building high school curriculums, by a large proportion of those who teach in upper primary and secondary schools, by those who write textbooks for these grades, by those who train teachers, and by key members of state and city boards of education, the shortage of scientists and technologists would surely soon be reduced; and, even more far-reaching and contrary to present reasonable expectation, a start might soon be made toward making basic scientific concepts acceptable in American culture. During the 50 years that I have been a reader of *Science* I have found neither in its pages nor elsewhere an equally cogent statement of the prime sources of present educational deficiency or failure in the sciences.

Two sentences will recall the core of the contribution: The problem centers in the high school. Involved there is practically the whole of the curriculum—not merely science and mathematics, but literature, history, and other of the humanities as well. Fortune has left it for a scholar in literature, and one actively teaching in a famous New York high school, to *document* satisfactorily the definite (and ultimately persuasive) prescientific bent of humanistic teaching in our high schools and, to point sharply to the resulting dichotomy in the basic thought and motivation of our people, involving an over-all denigration of the status and concepts of science. I quote: "But the humanities sweepingly ignore the role played by scientific insight and thinking in the ideology of our times and disdainfully march on their archaic way as though the atomic and electronic age had not arrived. . . . students must be attracted to the study of sciences, not *after* they are enrolled in the colleges, but *before*; not after they have elected physics and chemistry in the secondary schools, but before they do so. Moreover . . . they must be endowed with a perspective that will provide them with a profound and continuing motivation to apply themselves."

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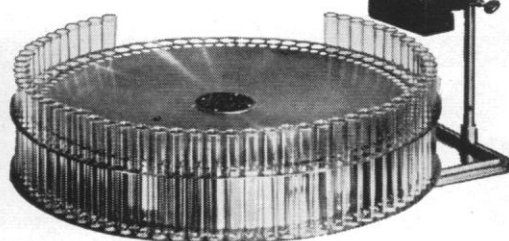
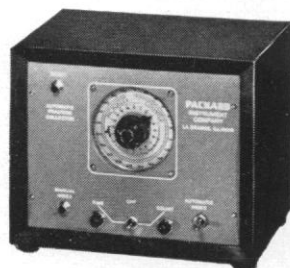
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avoided center of our prime cultural problem has now appeared in *Science*. This statement supplies conclusive evidence that our "manpower crisis" is an inseparable part of the more inclusive cultural problem and, apart from the latter, will not be solved adequately by the various helpful measures already envisaged or employed. Presumably, the potential of this exceptional publication is convertible to the actual only through making the article available to many or all of the hundreds of thousands mentioned here. Even such wide distribution of a powerful challenge would doubtless early meet only partial success; but a worse outcome awaits a neglect of this supplement to current "manpower" efforts, and surely much fresh interest in the manpower problem should now favor some success to a definitely directed urge that scientific concepts become respectable in our secondary education. Thus we arrive at questions of practical action: Can *Science*, or can individual or collective scientists, devise or provide means to that end? Where republication? Costs of lists, and of mailing reprints? In the annals of research these items seem something less than gigantic or formidable, but perhaps they can and will block a promising perceptible lift to both national safety and culture.

OSCAR RIDDLE

Plant City, Florida

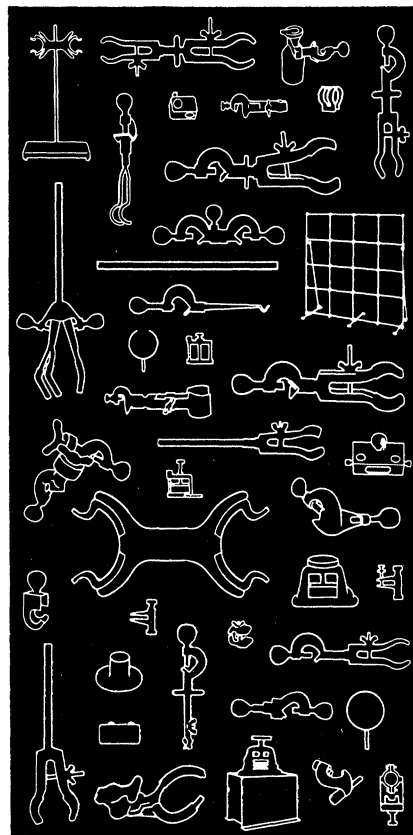
Joseph Gallant's major thesis that all insights into the nature of the universe are the proper province of literature [*Science* 125, 787 (1957)] appears well-taken. It is rather to support his contention than to cavil at it that one may question the correctness of his assertion that there are almost no contemporary instances of poetic integration of scientific concepts beyond the three cases he cites (Robinson Jeffers, Archibald MacLeish, and Mark Van Doren). Perhaps too much reliance was placed on the showing of exhaustive research in Helen Plotz' *Imagination's Other Place*, since from merely casual recollection it is possible to cite among the notable omissions from this anthology such names as those of Max Eastman, James Franklin Lewis, Alfred Noyes, Selden Rodman, A. M. Sullivan, and William Carlos Williams. Perhaps the list would grow more readily if the editorial board of *The Scientific Monthly* would reinstate F. L. Campbell's policy of publishing such work.

WILLIAM NEWBERRY

Olin Mathieson Chemical Corporation,
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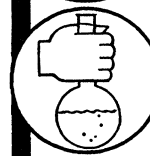
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are regarded by critics as representative of the poet's work—with the possible exception of the work of William Carlos Williams, for the omission of which there can be no excuse.

But this oversight on my part only highlights the more the fact that the scientific orientation of a poet's thoughts or emotions is the one aspect that literary discussion and criticism consistently neglect. This in turn emphasizes the urgency of focusing attention on the relationship of science to poetry and to literature in general.

On the curricular and pedagogic level the implication for me is that some agency should be set up to cull our imaginative literature, both prose and poetry, for revealing instances of the successful integration of scientific ideas and images with lyrical or imaginative expression and to bring these to the attention of teachers and students through recommended reading lists and anthologies. These will, in time, affect the standard syllabi and the standard literary anthologies. Such an agency would have to be charged with both research and public education.

On the creative and critical levels, new works incorporating the scientific outlook might be fostered by conferring the recognition and prestige of scientific bodies on them in some way, or by set-

ting up an agency to do so, which might be a link between the humanities and science.

It might be well for scientific societies, the various manpower agencies, or associations of technologic firms to consider creating such an agency for its ultimate effect on our culture and our scientific manpower resources. What seems to be most needed is an instrument for closer liaison of the humanities and science, not only in organizational terms (between, say, scientific professional groups and literary and scholarly associations), but also in terms of research, intercommunication, and publicity.

JOSEPH GALLANT

*Theodore Roosevelt High School,
New York, N. Y.*

Radiation and Health

I can only partially agree with the statements expressed in your editorial, "Radiation and health" [*Science* 125, 719 (19 Apr. 1957)]. The information on the radiation genetics of our species is exceedingly meagre, and currently we are forced to extrapolate from data collected by radiation geneticists working on the mouse, fruitfly, and various plants and microorganisms. To collect data for our species, we shall have to gather every scrap of information that results from

each sizable exposure of the human reproductive system to ionizing radiation. Presumably, such exposures can occur accidentally or from medical diagnostic and therapeutic procedures.

I will grant that a record of exposures may be of no value to the individual keeping it, since the decision to expose this individual to further x-rays is primarily governed by the need for medical diagnosis or therapy. This is not the point, however. The value of records of this kind is that as they accumulate and the pedigrees of exposed individuals become available, only then can the geneticist attempt, from an analysis of these data, to determine the exact magnitude of the radiation hazard to the human germ plasm.

When one is ignorant admit it, proceed cautiously, and attempt to remedy the situation. In genetics, as G. Mendel has observed, the only way to remedy ignorance is to engage in the bookkeeping necessary for the construction of pedigrees. The answer to the question "Would the considerable effort required to keep such records for a large part of the population be worth while?" is an unqualified Yes.

ROBERT C. KING

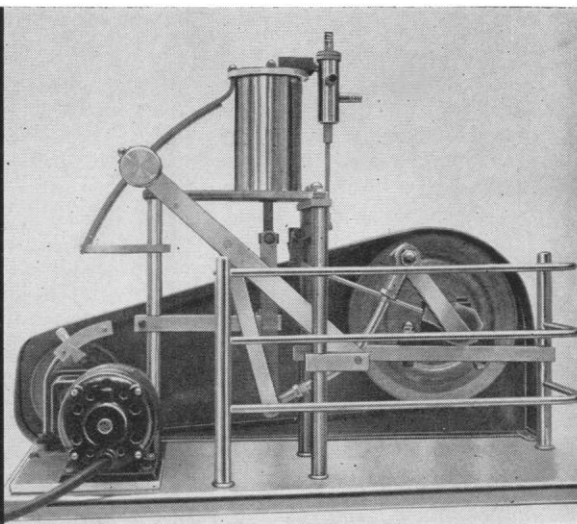
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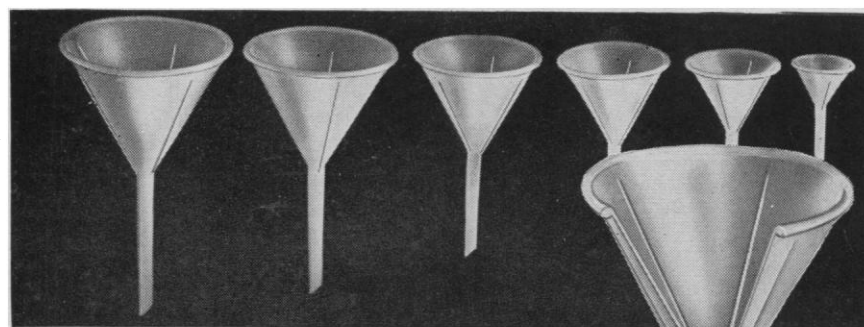
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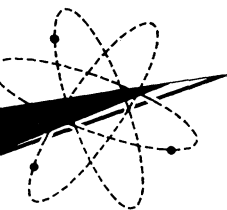
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Unusual opportunity for outstanding Ph.D. in organic chemistry with good pharmacology background to head unit dealing with correlations between chemical structure of medicinal compounds and their physiological activity. Needs broad research experience, lively imagination and an appreciation of the problems as associated with the discovery and development of new pharmaceutical agents. Progressive eastern pharmaceutical manufacturer. Broad benefit coverage. Send complete personal resumé.

Box 187, SCIENCE

Comparative Anatomist—Visiting Professor, retired or sabbatical, for fall semester 1957 only. Box 189, SCIENCE. X

Director, diagnostic and research tuberculosis laboratory, central Florida, physician or non-physician microbiologist or clinical chemist. Part-time employment will be considered. Write Dr. Albert V. Hardy, Director, Bureau of Laboratories, State Board of Health, P.O. Box 210, Jacksonville, Florida. uc

(a) **Executive Director,** State Association for Mental Health; graduate training in mental health field (for example, social work, sociology, psychology), preferably doctoral level; although may be substituted for formal training; \$6500-\$9000. (b) **Physiologist** well trained in mammalian physiology. **Biochemist** experienced in metabolism, and **Bacteriologist** experienced in immunology and tuberculosis studies to serve as research associates, medical school research department; \$6500-\$7500; Midwest. (c) **Chemist,** M.S. or Ph.D.; research department, 200-bed hospital; Ohio; \$6000-\$7000. (d) **Analytical Chemist,** Ph.D., to direct group of analytical chemists; new research center, large industrial company; Pacific Coast. (e) **Bacteriologist,** Ph.D., to direct manufacturing laboratories; various research programs; \$5500-\$8000; near Chicago. S6-2 Medical Bureau, Burneice Larson, Director, 900 North Michigan Avenue, Chicago. X

Supervising Hospital Biochemist for a clinical chemistry laboratory of a large university hospital affiliated with a medical college; also teaching opportunity. Broad experience is required. Salary range, \$7047 to \$7830. Liberal personnel policies. Please address your communication indicating your background and experience to the Administration Office, Cincinnati General Hospital, 3231 Burnet Avenue, Cincinnati 29, Ohio. 6/21, 28; 7/5, 12, 19, 26; 8/2

POSITIONS OPEN

Applications are invited for the positions of **HEADS OF THE DIVISIONS OF PHYSICS AND CHEMISTRY** of the Saskatchewan Research Council. Applicants should have a doctor's degree or its equivalent and 6 to 8 years' research experience, including 6 years in supervision of investigational work.

The field of interest of the Saskatchewan Research Council includes both pure and applied science but is mainly directed to matters affecting the economy of the Province. Within this field the work is widely diversified. The Council's laboratory building is now under construction on the grounds of the University of Saskatchewan and is expected to be ready for occupancy in April 1958. Applicants should be prepared to join the Council before that time in order to participate in planning the initial program of research.

Inquiries are to be addressed to Dr. T. E. Warren, Director, Saskatchewan Research Council, University of Saskatchewan, Saskatoon, Saskatchewan. 6/14, 21

PHYSIOLOGISTS PHARMACOLOGISTS BIOCHEMISTS

Ph.D.'s in physiology, pharmacology or biochemistry with major background and experience in field of

- (a) Cardiovascular and/or nutrition
- (b) Endocrinology

... for team participation in the development of new therapeutic agents. Large pharmaceutical manufacturer. Philadelphia location. Liberal benefit program. Send resumé.

Box 185, SCIENCE

Research Assistant, B.S. or M.S. Conscientious person with good college record in chemistry and/or biology and willingness to learn. Desired for work on the central nervous system employing biochemical and biophysical techniques. Salary level consistent with training and experience. Midwest. Box 161, SCIENCE.

5/31, 6/7, 14, 21, 28, 7/5, 12

Research Chemist, Experienced. M.S. (or equivalent) in organic or biochemistry. Independent research—project in separation of peptides; using techniques of chromatography, fractionation of proteins and lipids, and so forth. Opportunity to work toward advance degree under tuition remission plan. Apply directly or send resumé to Personnel, New York University-Bellevue Medical Center, 420 East 34 Street, New York 16. X

Scientist—Junior: M.S. or equivalent in organic chemistry and/or biochemistry. Some knowledge of patent procedures and foreign languages desirable to participate in the evaluation of foreign scientific information for a Philadelphia pharmaceutical manufacturer. Liberal benefit program. Send complete resumé. Box 188, SCIENCE.

6/21

SCIENCE TEACHERS, LIBRARIANS, ADMINISTRATORS urgently needed for September positions in many states and many foreign lands. No fees. Also unusual summer jobs and study awards. Rush \$1 for complete job data, salaries. CRUSADE, SCI, Box 99, Station G, Brooklyn 22, N.Y. EOW

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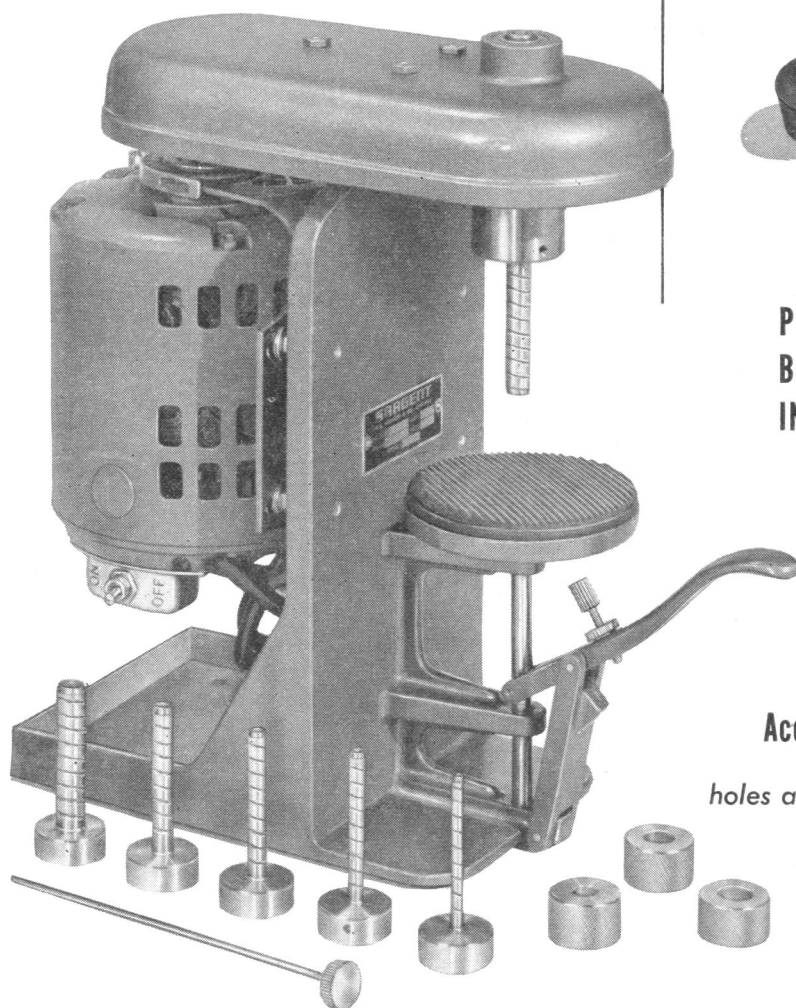
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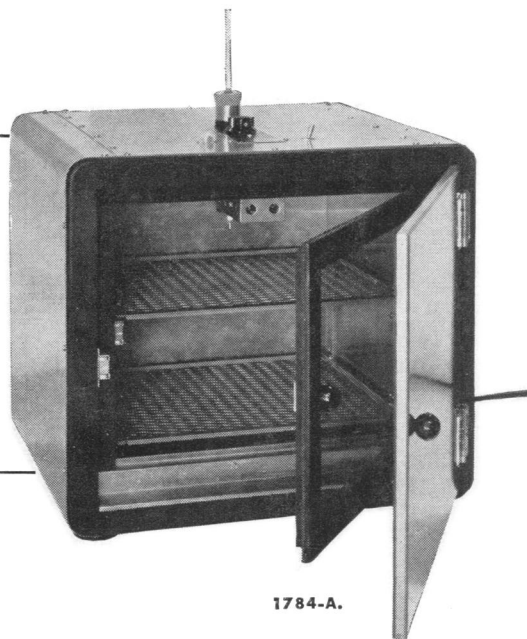
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