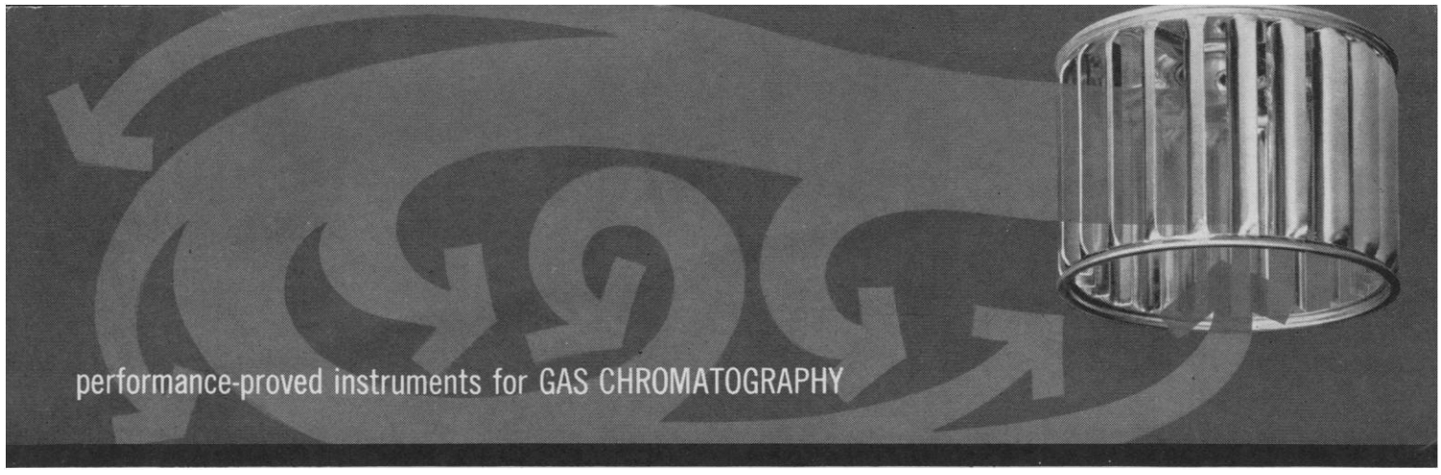
SCIENCE

3 January 1964

Vol. 143, No. 3601

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

QUEEN ANNE'S LACE



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Cat. Nos.	No. of openings	Tube diam.	Price
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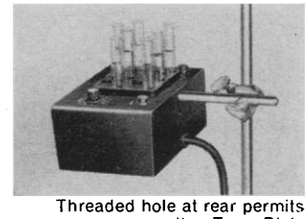
2072	20	12 & 13 mm.	
2073	12	15 & 16 mm.	
2074	8	20 mm.	**$15.00** each
2075	6	25 mm.	
2076 (combination)	3 5 6	25 mm. 12 & 13 mm. 6 mm.	



Threaded hole at rear permits suspending Temp-Blok.

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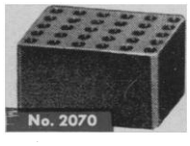

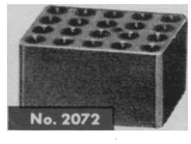

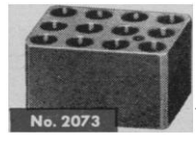

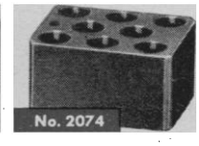

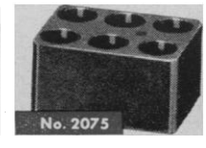

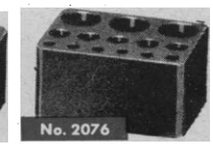

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COVER

Flowers of this wild carrot were produced from a tissue culture. Freely suspended cells were grown to embryoids, to plantlets, and then to the flowering stage. The morphology of the plant developed by this method is precise, even to the few red flowers at the center of the inflorescence. See page 20.

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SCIENCE

The Appropriate Function of a University

Today the dominant trend in our universities is toward trying to do too many things. What is the appropriate function of a university? Should it emphasize community service; should it provide a base of operations for its faculty, or should it exist to teach? Obviously it should exist primarily for educating the young. This is the one function which it can uniquely perform and, in the long view, the most important. Other organizations can provide community service or furnish housing for those whose only interest is research.

It is difficult to know when a university is doing a good job of teaching, and those who judge university administrations seldom evaluate them on the basis of the quality of their human output. Rather, institutions are judged by some on the basis of their football teams; by others, on their budgets, rate of increase of endowment, or new buildings. Among professionals, standards are employed which in their way are as false as the criterion of athletic prowess; for example, institutions are rated on the number and brilliance of their academic stars.

By "stars" I mean men who in various ways have made a name for themselves. But does the presence of such men necessarily contribute much to the teaching function of the university? Sometimes it does, but many of these men are only occasionally on campus or have little or no time for students.

Another fashionable standard for judging a university is the amount of research activity. Thus, university administrators tend to follow the "publish or perish" approach. As a result, many scientists find it expedient to neglect teaching duties. Those engaged in research have always enjoyed advantages over the teachers, few of whom gain recognition even in their own institutions. Under the present rules of the game, any scientist who teaches when he can do research must be unusually public-spirited or blind to his own interest. The result is to demean teaching. How can a professor approach a class with enthusiasm and adequate preparation if he is convinced that education of undergraduates is a secondary function of the university?

Few administrators would admit publicly that they give low priority to education, and indeed most would prefer to provide excellence in teaching. The difficulty is that academic stars and research output can be easily identified and can bring acclaim to an institution. How many universities have gained renown for their instruction?

The problem of establishing criteria for performance in teaching is difficult. Many components must be considered in judging whether a man has been educated. Surely the accumulation of knowledge is important, and achievement tests are one objective means of measuring performance. In scientific fields it should be possible to establish additional criteria. On completion of his doctorate in science, a man begins to publish papers, or if he is in industrial research he begins to rise in the company. After 3 or 4 years one can judge his scientific competence and potential.

Among the needs in education today are well-established, nationally recognized performance standards for educational achievement. Creation of such criteria could assist in redressing the present imbalance between research and teaching in our universities.—P.H.A.

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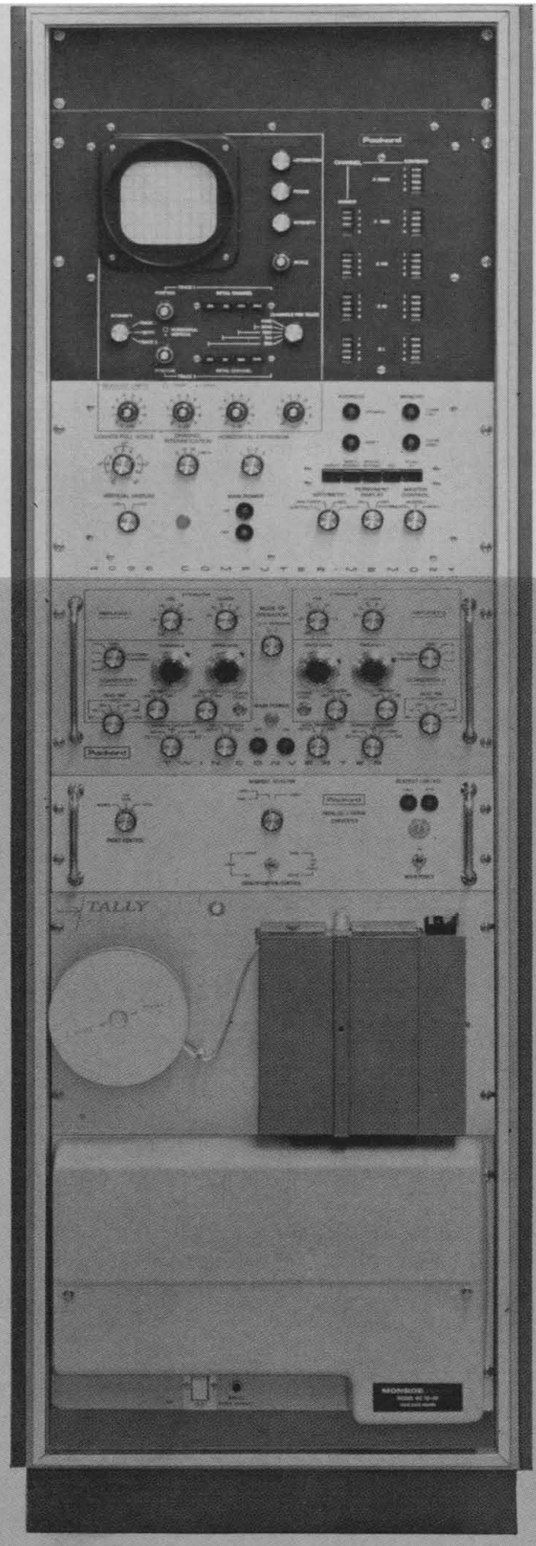
AN EXPANDABLE DATA ACQUISITION and PROCESSING SYSTEM



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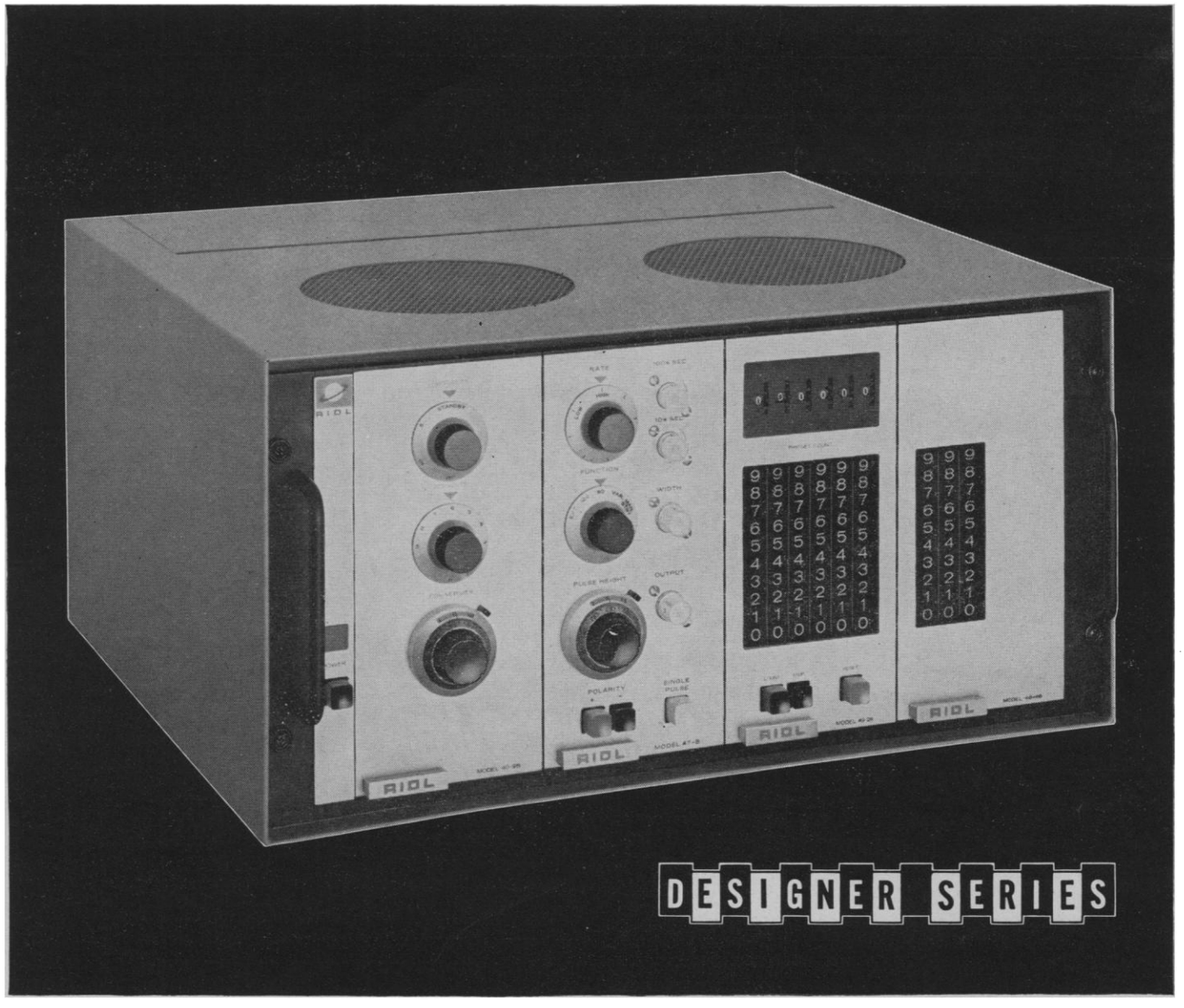

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in several phenomena. The flux filaments postulated in the electromagnetic structure of type-II superconductors are thought to contain one flux quantum each. However, as noted earlier, these filaments have not been detected by any method that could be considered reasonably direct. Also, it is believed that flux filaments are the unit of electromagnetic structure when a magnetic field is applied perpendicular to the plane of a thin superconducting film, even though the film is of type-I material.

Just as for bulk type-II materials, the flux-filament model leads to correct predictions of the properties of films, such as the upper critical field and its angular dependence. These results inspired an attempt to get more direct evidence for the existence of quantized flux filaments. The resistance of a thin film was measured as a function of magnetic field perpendicular to the plane of the film, the film being so narrow ($\sim$ 1 micron) that its physical dimension would determine the size of the flux filament. It was argued that minima in the resistance measurements should occur at values of the magnetic field that would make one flux quantum thread an area determined by the width of the film; minima were seen at about the expected values of H.

The cylinders in which flux quantization may be observed are a few microns in diameter; persistent currents are observed in samples as large as several centimeters. Thus a form of order, the phase coherence of the superconducting wave function, persists over distances much longer than the coherence length mentioned earlier. This long-range order was discussed at length, the fundamental question being its universality. Long-range order and thus flux quantization exist in some materials. Do they in all? In one preliminary experiment with vanadium cylinders there seemed to be no flux quantization.

The conference, attended by 350 scientists from 11 countries, was sponsored by the International Union of Pure and Applied Physics, the National Science Foundation, the Advanced Research Projects Agency, and the General Electric Research Laboratory. The conference proceedings are to be published in the January 1964 issue of *Reviews of Modern Physics*.

HOWARD R. HART, JR.
ROLAND W. SCHMITT
General Electric Research Laboratory, Schenectady, New York

Forthcoming Events

January

20–22. American Inst. of **Aeronautics and Astronautics**, aerospace sciences meeting, New York, N.Y. (R. R. Dexter, AIAA, 2 E. 64 St., New York 21)

20–23. **Cardiovascular Drug Therapy**, symp., Philadelphia, Pa. (S. Rosen, Dept. of Medicine, Hahnemann Medical College and Hospital, 230 N. Broad St., Philadelphia 2)

20–24. **American Mathematical Soc.**, Miami, Fla. (AMS, 190 Hope St., Providence 6, R.I.)

20–24. **Australian and New Zealand Assoc. for the Advancement of Science**, Canberra (J. R. A. MacMillan, Faculty of Agriculture, Univ. of Sydney, N.S.W., Australia)

20–27. **Agricultural Film Competition**, 3rd intern., Berlin, Germany. (Congress Hall, John Foster Dulles Allee, Berlin N.W. 21)

22–25. **American Physical Soc.**, New York, N.Y. (APS, Columbia Univ,, New York, N.Y.)

22–25. American Assoc. of **Physics Teachers**, New York, N.Y. (E. U. Condon, Oberlin College, Oberlin, Ohio)

23. Central Council for **Health Education**, annual conf., London, England. (Director, CCHE, Tavistock House, Tavistock Sq., London, W.C.1)

23–24. **Industrial Water and Waste** Conf., Austin, Tex. (J. B. Maline, Jr., 305 Engineering Laboratories Bldg., Univ. of Texas, Austin 12)

25. **Industrial Hygiene** and Air Pollution, 8th conf., Austin, Tex. (J. O. Ledbetter, 305 Engineering Laboratories Bldg., Univ. of Texas, Austin 12)

27–30. Society of **Plastics Engineers**, 20th annual technical conf., Atlantic City, N.J. (J. J. McGraw, Natl. Vulcanized Fibre Co., Philadelphia, Pa.)

27–31. UNESCO, working party on **scientific translation and terminology**, Rome, Italy. (UNESCO, Place de Fontenoy, Paris 7)

28–30. **Entomological** Soc. of America, southeastern branch, Asheville, N.C. (W. C. Nettles, Clemson College, Clemson, S.C. 29631)

29–31. American **Meteorological** Soc., 44th annual, Los Angeles, Calif. (A. Court, 17168 Septo St., Northridge, Calif.)

29–1. Southwestern Federation of **Geological Societies**, 6th annual, Midland, Tex. (W. E. Wadsworth, AAPG, 1444 S. Boulder, P.O. Box 979, Tulsa 1, Okla.)

29–1. Western Soc. for **Clinical Research**, 17th annual, Carmel-by-the-Sea, Calif. (H. R. Warner, Latter-Day Saints Hospital, 325 Eighth Ave., Salt Lake City, Utah)

30–31. Spontaneous and Experimental Comparative **Atherosclerosis**, conf., Beverly Hills, Calif. (E. McCandless, Los Angeles County Heart Assoc., Los Angeles 57, Calif.)

February

2–5. American Inst. of **Chemical Engineers**, annual, Boston, Mass. (J. Henry, AICE, 345 E. 47 St., New York, N.Y.)

2–7. Institute of **Electrical and Electronics Engineers**, winter meeting, New York, N.Y. (A. P. Fughill, Detroit Edison