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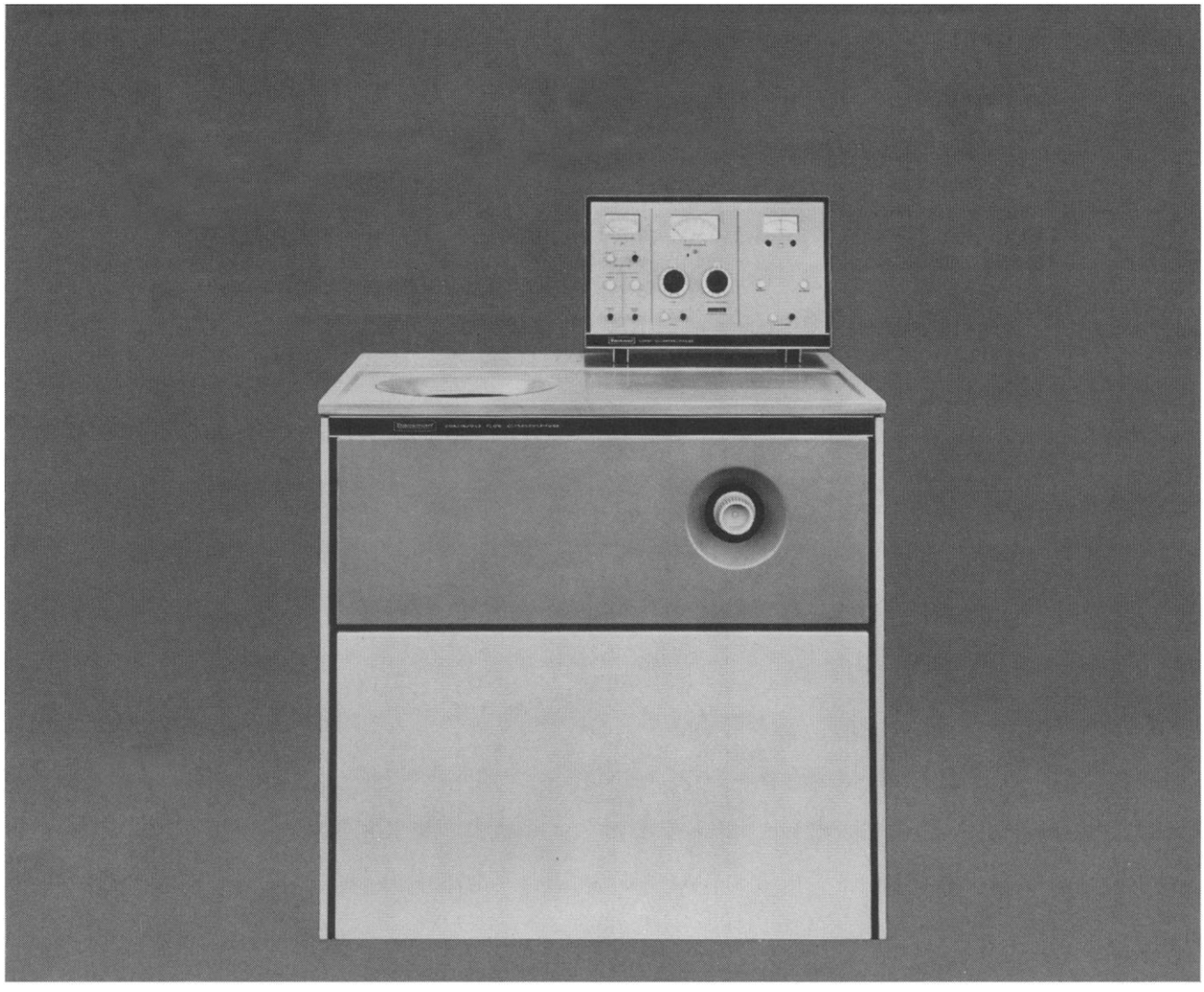

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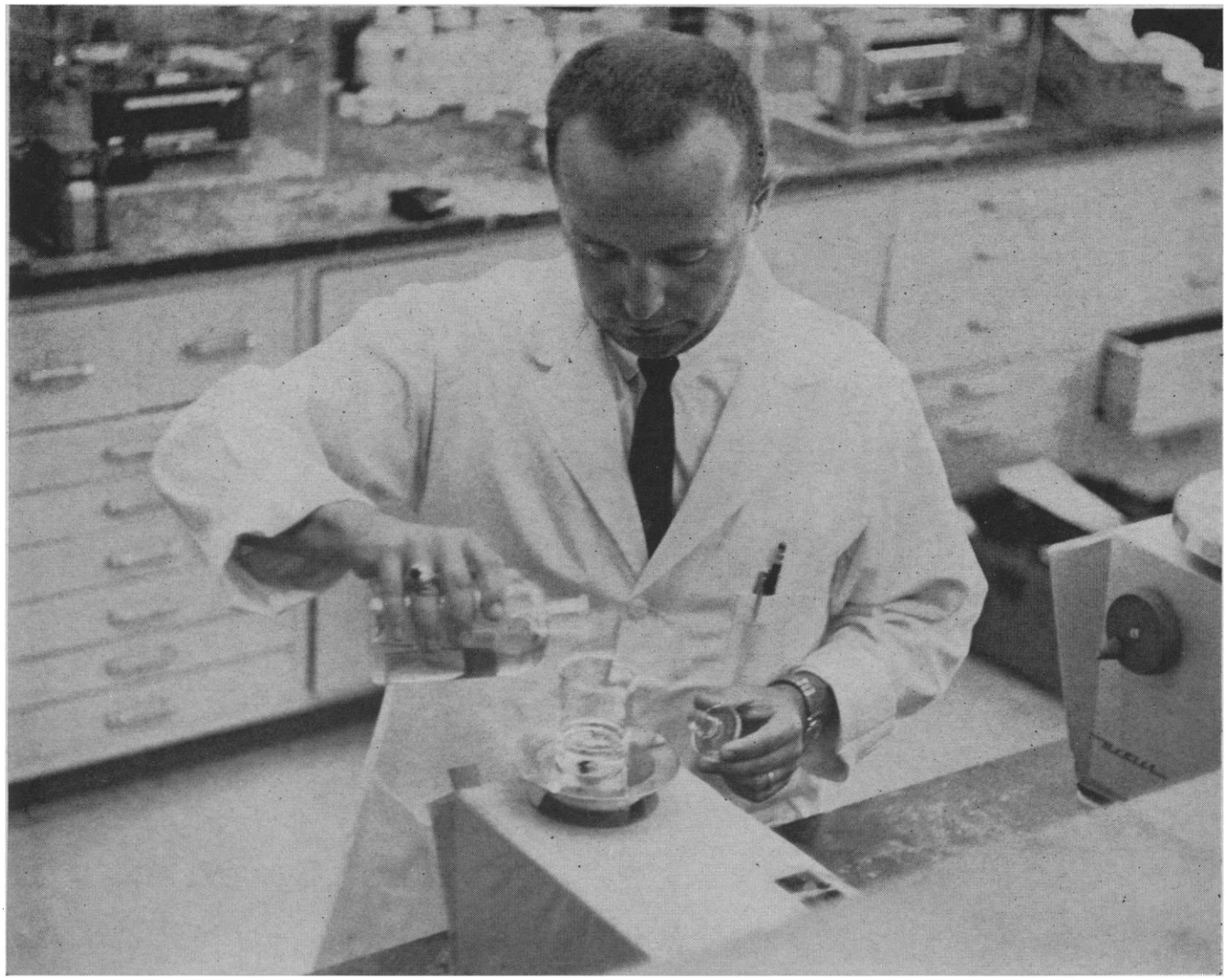

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is the excellent correlation between Ph.D. production in given areas of research at the various institutions and the federal research funds which they receive in these areas. The point raised by the subcommittee simply shows the great disparity among the disciplines in the cost of research per graduate student. For an institution specializing in research in oceanography or radio astronomy, for example, the cost of equipping a student may be hundreds of times that found in a university which is strong in research of a purely theoretical nature.

A third concern of the subcommittee is the decrease in some disciplines of the percentage of new teachers holding the Ph.D. degree, and this is laid to the failure of federal research funds to raise the general level of training in university faculties. The figures given include teachers in universities, colleges, and junior colleges. One might legitimately wonder how we have managed to do as well as we have in the face of the tremendous growth in the number of science students and the increase in numbers of junior colleges in recent years. Perhaps the subcommittee should have asked what these statistics might be if we had *not* had federal research funds, and, to be fair, it should also have noted that the proportion of Ph.D. teachers in some science and engineering disciplines has actually increased. . . .

The key argument in the report, and that of most critics of federal support of basic research, concerns the concentration of funds in a few institutions. This concentration exists as a result of the policy of using research funds to support what is judged by scientists and engineers to be the best research. If we are to use research money to accomplish the additional purpose of spreading research more widely, with immediate quality as a secondary objective, then let's do this honestly and not blame the federal agencies for failing to do a job they were not commissioned to do. There are, of course, several programs already in existence which have the effect of spreading research support to more individuals and more institutions. Examples are the various institutional research grants which delegate to the university the choice of the specific research to be supported, and NSF's Engineering Research Initiation Grants, in which young faculty members compete for support only with their peers and not with established researchers. I would favor more programs of this sort to broaden the nation's research capability, but I believe it would be a grave mistake to use the bulk of our research funds for any purpose other than that of supporting the best research. . . .

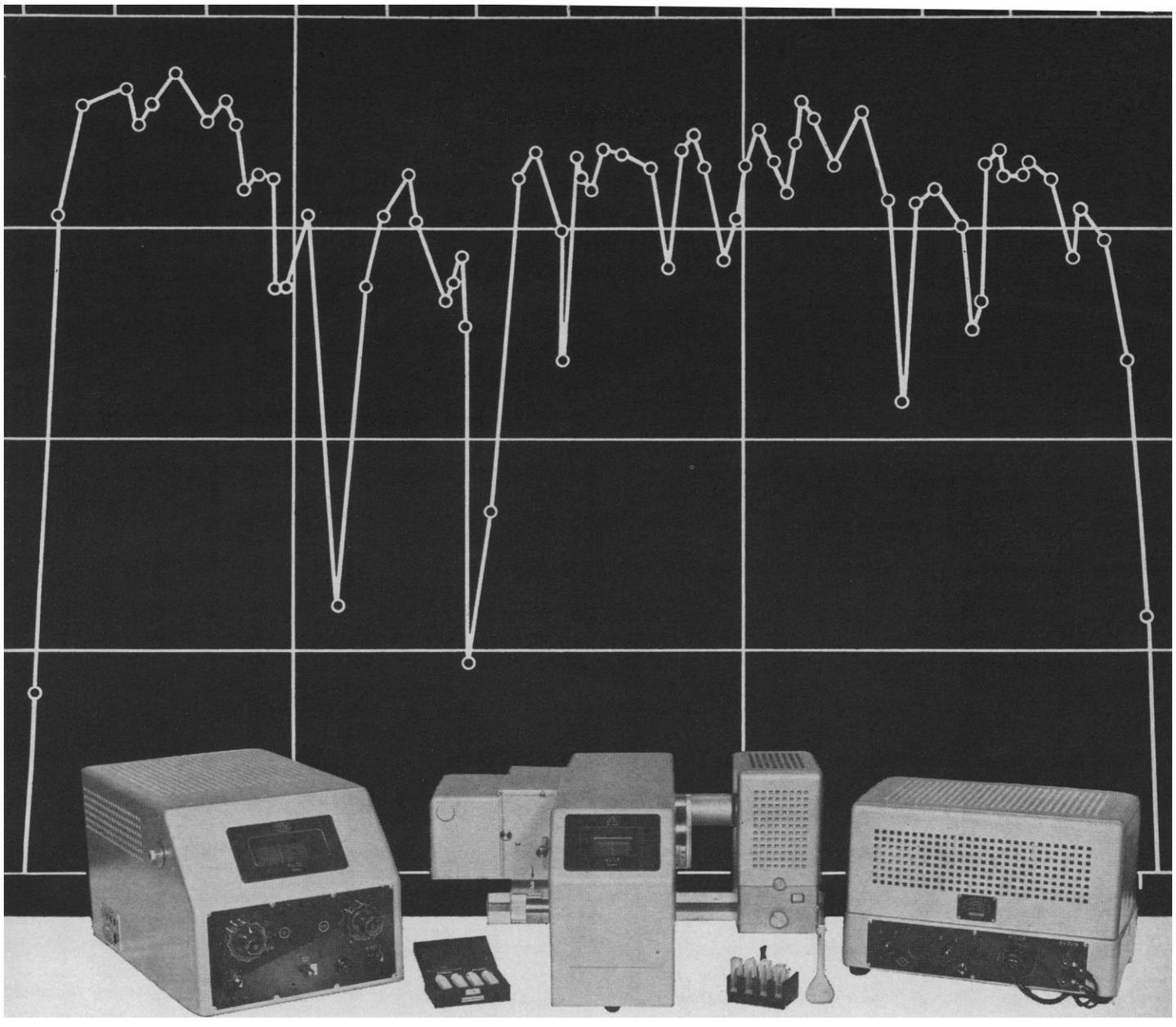
Finally, the subcommittee seems to have missed completely the intent of NSF's Science Development Program and to have taken the testimony of Henry Riecken out of context to mean that the program would be used for "improving . . . lagging departments in already important research institutions." Any honest observer will agree that the grants made to date have not been made for this purpose, but rather, as is the intent of the program, have gone to departments which are currently strong enough to give reasonable expectation that they might achieve excellence with the infusion of grant money, properly used. And, although the universities receiving these grants are not completely devoid of prior research support, they are also not on anyone's list of the nation's research-affluent institutions. . . .

The federal research baby is a precocious youngster whose health is vital to the future of our nation. Let's work to keep him well fed and well scrubbed. Let's not throw him out with the bath.

W. EDWARD LEAR
*College of Engineering,*
*University of Florida, Gainesville*

The report of the Reuss subcommittee entitled "Conflicts between the Federal Research Programs and the Nation's Goals for Higher Education" gives me concern, especially after carefully comparing it with the published responses to subcommittee inquiries and the published testimony. The one excerpt from my written statement to the committee, while accurately quoted in this report, gives no hint of my general response to the questions asked.

My general position was that, in a modern university, science teaching and research are inseparable. The direct role of research is small at the undergraduate level, growing in importance through the junior and senior years and becoming the key educational vehicle in the practically tutorial relationship between a faculty member who guides thesis research and the student working for an advanced degree. But even at the more elementary under-



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# Psychological Testing and the Invasion of Privacy

Last June the House of Representatives Special Subcommittee on Invasion of Privacy and the Senate Subcommittee on Constitutional Rights held hearings on the threat to the right of privacy posed by the use of psychological tests. The committee hearings and the extensive report in the November 1965 issue of the *American Psychologist* provide a fascinating account of the discussion of this problem.

The tests in question are not those that measure ability or aptitude but the ones intended to assess emotional stability or personality characteristics. Some of the questions used in such tests are innocuous, but others deal with sex, family or interpersonal relations, religious beliefs, and other emotionally charged topics. The constructors of the tests consider such items to be essential. Nothing fundamental about a person is learned by asking whether he prefers Tuesdays or Wednesdays, but perhaps something fundamental can be learned by inquiring about such matters as whether he prefers being the life of the party or being alone with a member of the opposite sex. In short, if one is to learn about personality differences or emotional stability, one must probe emotionally important areas.

An individual, however, may object to being asked about intimate details of his life and beliefs, and may fear that, if the test forms remain in personnel files, his answers could be used against him. Thus, some of the committee members and some of the witnesses contended that the use of such tests constitutes an invasion of privacy that violates the fourth and other amendments to the Constitution.

On the other side of the case, it is necessary to learn some things about a prospective employee. Past experience and abilities are almost always relevant. For some positions, health is important. And for some positions it is desirable to learn about emotional stability or other aspects of personality. We do not want emotionally unstable persons serving in air-traffic control towers, representing the United States in sensitive overseas assignments, or sitting in various other positions of special responsibility.

There is no easy solution to the conflicting claims of the individual's right to privacy and the public's right to protection. It does not help to point out that wiretappers and snooping news photographers are guilty of greater invasions of privacy. Nor is the problem handled by contending, as some witnesses did, that the tests are of no value anyway, for, if the present ones are of doubtful validity, more effective methods are likely to be developed.

On the one side, as one witness said, we must seek those methods of protecting the public that are least intrusive on private rights. On the other side, if we want to protect society we must learn to ask the questions that will help us avoid creating dangerous situations. This is the dilemma highlighted by the congressional enquiry.

The constructors of the personality tests sometimes use "forced-choice" items in which the respondent is required to choose between two alternatives both of which may be attractive, but which are, they believe, differentially attractive to different kinds of people. The conflict between private and public rights is itself a kind of forced-choice situation. Both rights have their claim. Which we rate the higher will reveal something about our scale of values, about the kind of people we are.—DAEL WOLFLE

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to 99.5 percent of RNA synthesis per unit time. The relation between differential nucleic acid metabolism in polytene chromosomes of *Diptera*, as shown by puffing, and patterns of differentiation was discussed in independent papers by C. Pavan (University of São Paulo) and U. Clever (Purdue University). An enhanced synthesis of RNA, resulting from greater gene activity, is associated with the puffed chromosomal region. Some of the most convincing evidence that puffing is related to developmental processes is afforded by experiments with the hormone ecdysone which induces molting and also causes puffing at specific loci.

One session of the symposium was devoted to discussions on the genetic control of differentiation in plant development. The present status of research on species of the genus *Acetabularia* was presented by G. Werz (Max Planck Institut für Meeresbiologie, Wilhelmshaven). Morphogenesis in these unicellular and uninucleate green algae is governed by the activity of "morphogenetic substances," probably messenger RNA. Under the influence of "regulators," located within the cytoplasm, the potentialities of the morphogenetic substances are realized, that is, expressed in morphological development. Realization depends, therefore, not only on temporary activations of nuclear genes, but also on activations of certain gene products already transferred and stored in the cytoplasm.

B. McClintock (Carnegie Institution of Washington) summarized evidence in maize for identifiable controlling elements that govern the action of genes during development. Three systems were discussed in some detail: the *Ac* system, the *Spm* system, and the *Dt* system. The elements of all three systems share many properties in common, which suggests a basic relationship among them with regard to origin and composition. Furthermore, elements with the same properties are present in some strains of maize derived from different geographic regions, so that there is little reason to doubt that they are common components of the maize genome. A basic difference between differentiation in plants and animals is that meristems of plants remain in an embryonic condition throughout the life of the individual, whereas most animals have only one early embryonic stage. G. L. Stebbins (University of California) pointed out that, as a consequence, the most significant genetic changes in the evolution of higher plants are those that

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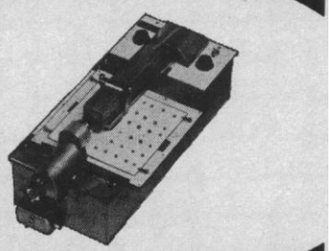

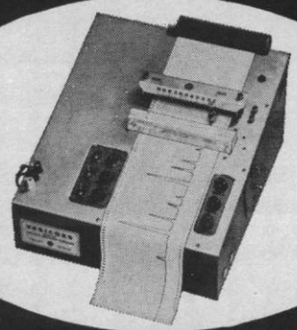

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affect the structure of, and cell behavior in, the primary meristem from which the various organs are differentiated. Shifts between a condition that is basically determined by cellular elongation to one that is determined mostly by mitotic divisions without cell enlargement can be demonstrated to be under gene control in barley. Furthermore, morphogenetic effects in meristematic regions and where a symmetrical mitoses occur are shown to be related to changes in nucleic acid synthesis and mitotic rhythm.

This symposium will be published in a volume entitled *Genetic Control of Differentiation*, which is expected to be available around the first of the year from the Clearinghouse of Federal Scientific and Technical Information, National Bureau of Standards, Springfield, Virginia. The volume represents, then, a judicious sampling of present research activity on the genetic control of differentiation where, at some future time, a new synthesis in biology may emerge.

HAROLD H. SMITH
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*Brookhaven National Laboratory,*
*Upton, New York 11973*

## Forthcoming Events

### January

*11–12.* Man's Extension into the **Sea**, symp. on SEALAB II, Washington, D.C. (T. Evans, Conference Management Organizer, Colonial Bldg., 105 N. Virginia Ave., Falls Church, Va. 22046)

*12–14.* **Medicinal and Aromatic Plants in India**, symp., Central Indian Medicinal Plants Organization, Lucknow, India. (S. C. Datta, CIMPO, 4 Sapru Marg, Lucknow)

*12–20.* International **Fertility** Assoc., Latin American mtg., Acapulco, Mexico. (M. Roland, 109-23 71st St., Forest Hills, N.Y. 11375)

*13–14.* **Body Fuel Utilization**, conf., Boston, Mass. (F. D. Moore, Dept. of Surgery, Harvard Medical School, 25 Shattuck St., Boston, Mass. 02115)

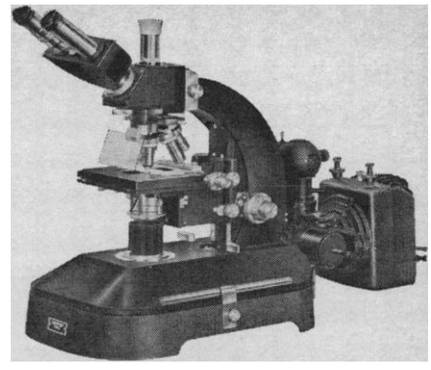
*13–14.* Institute of **Mathematical Sciences**, 4th Mathscience anniversary symp., Madras, India. (C. P. Ramaswami Aiyer, Inst. of Mathematical Sciences, Madras)

*13–16.* Indian Institute of **Metals**, 19th annual mtg., Hyderabad. (The Institute, 31 Chowringhee Road, Calcutta 16)

*16–21.* American **Chemical** Soc., winter mtg., Phoenix, Ariz. (ACS, 1155 16th St., NW, Washington, D.C. 20036)

*17–19.* **Labelled Proteins in Tracer Studies**, conf., Pisa, Italy. (Euratom, Labelled Compounds Div., 51-53, rue Belliard, Brussels, Belgium)

*19–21.* **Instrumentation** for the Process



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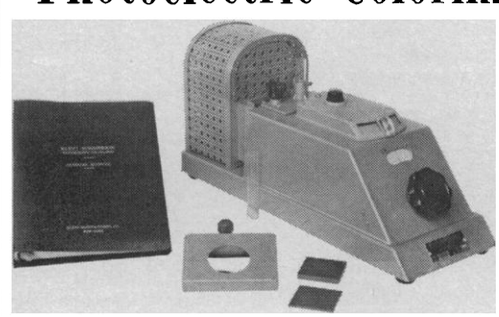

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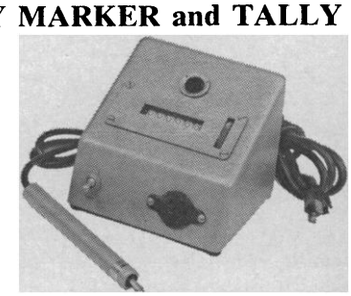

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