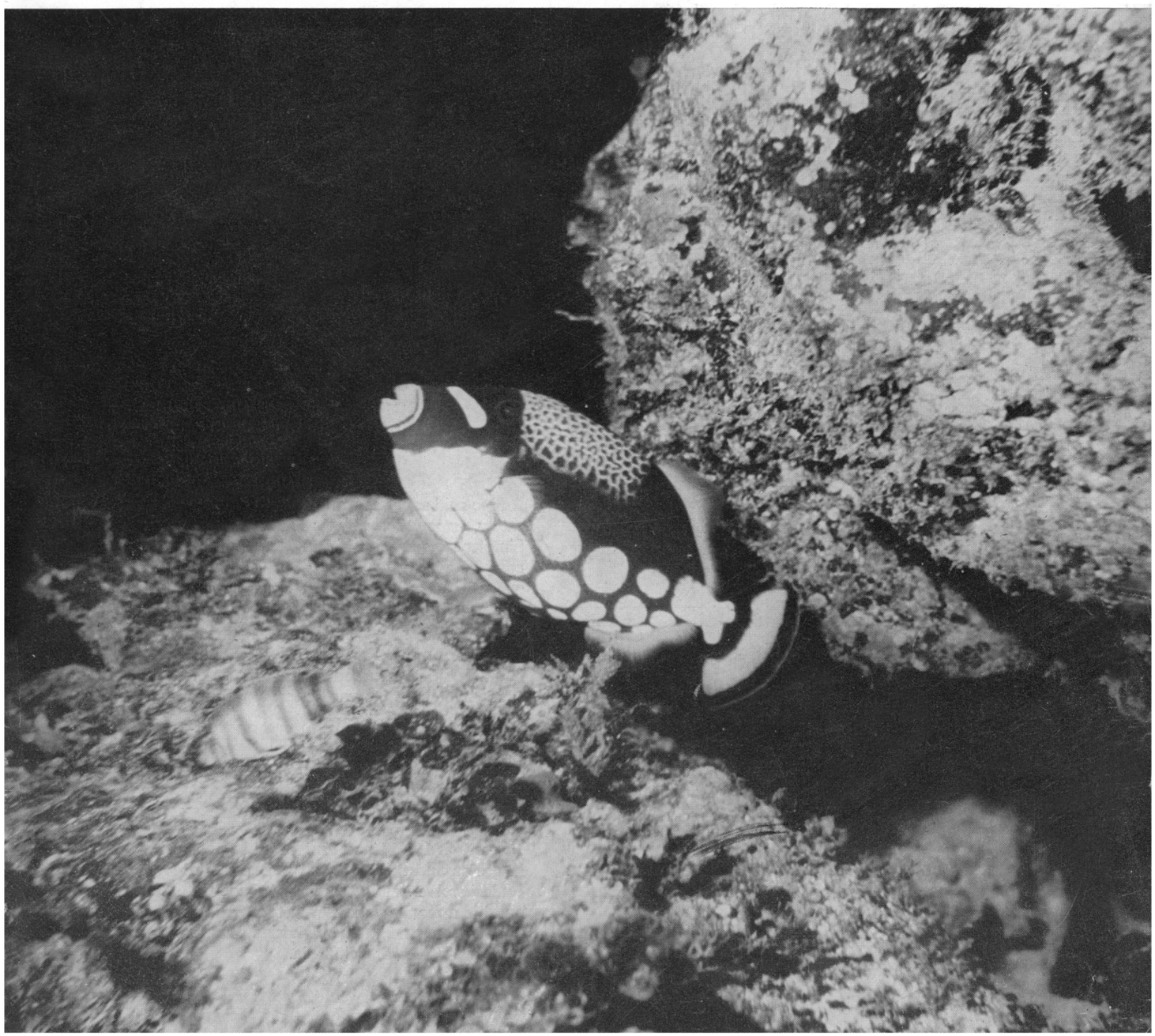
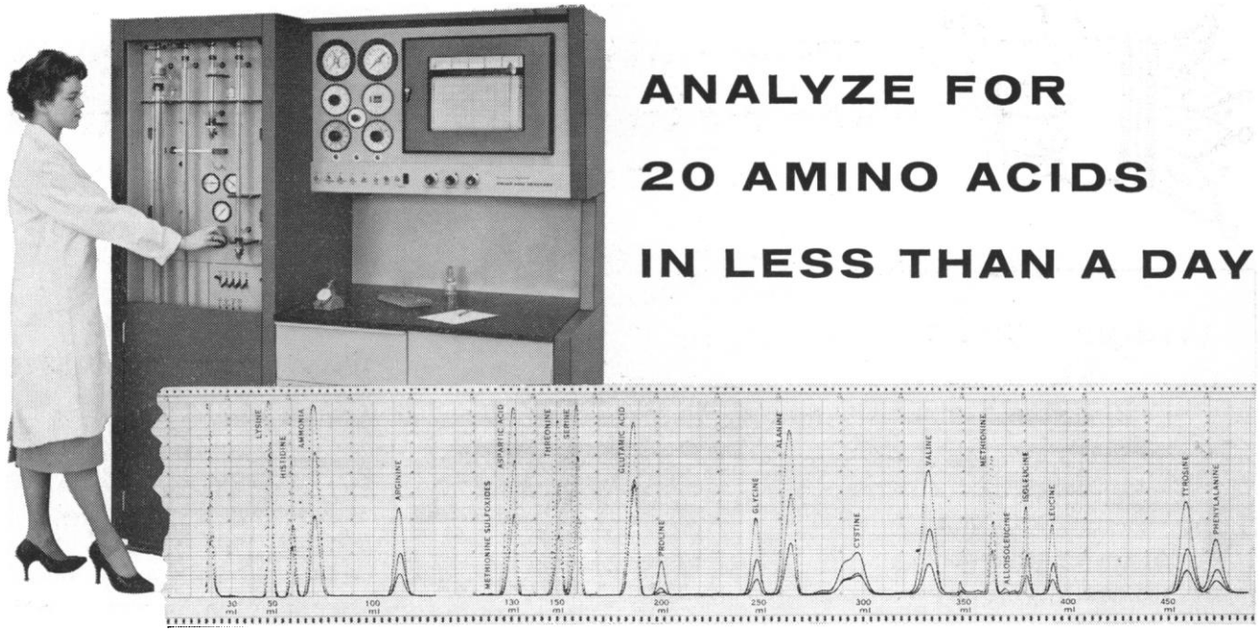
SCIENCE

8 April 1960
Vol. 131, No. 3406

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE





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Cover

Leopard or queen triggerfish, *Balistes conspicillum* Bloch and Schneider *(Balistoides niger)*, photographed at a depth of about 100 feet, in Okinawa. The fish spends much of its time in the seclusion of coral grottoes. [J. D. Bromhall, University of Hong Kong]

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Letters

Birth Control and Catholic Doctrine

The comments of J. K. O'Loane [*Science* **130**, 1302 (1959)] on M. E. Davis' review of Sulloway's *Birth Control and Catholic Doctrine* [*Science* **130**, 559 (1959)] deserve notice because they illustrate strikingly the dual intellectual attitude of the Catholic scientist. O'Loane is quite correct, of course, in his description of the distinction which the Catholic Church makes between its doctrine and its opinion. As a scientist he will no doubt understand that for a non-Catholic what matters is what the Church claims and does, and not whether, inside the Church, one particular claim is based on doctrine, or on personal taste, or on scientific evidence. It must have been small consolation to Bruno and Galileo that their torments were caused by the then prevalent opinion of the Church and not by a point of immutable doctrine.

As regards the important subject of controlling the size of our population, scientists are glad to learn from O'Loane that Catholic *doctrine* is not against artificial birth control; this justifies the hope that on this point also the Catholic Church will someday change its opinion, even if—as in the case of the heliocentric system—it takes three centuries to do so.

GEORGE CALINGAERT
101 Ver Planck Street,
Geneva, New York

In a recent letter J. Kenneth O'Loane reproved M. Edward Davis for accepting Sulloway's view that the Catholic Church has made an official pronouncement against contraception. O'Loane contended, *au contraire*, that although some Catholic writers have adopted the position alleged by Sulloway to be the Church's, the Church itself "never has taken a doctrinal stand that 'separation of intercourse and parenthood' is wrong." In this dispute I side with Davis and Sulloway and should like to provide the Papal text that supports their position and to comment briefly upon the issue.

In the encyclical *Casti connubii*, dated 31 December 1930, Pius XI declared the following with regard to contraception: "Since, therefore, openly departing from the uninterrupted Christian tradition, some recently have judged it possible solemnly to declare another doctrine regarding this question, *the Catholic Church*, to whom God has entrusted the teaching and defense of the integrity and purity of morals, standing erect in the midst of the moral ruin which surrounds her, in order that she may preserve the chastity of nuptial union from being defiled by this foul stain, *raises her voice in token of her divine ambassadorship and through Our mouth proclaims anew: any use whatsoever of matrimony exercised in such a way that the act is deliberately frustrated in its natural power to generate life is an offense against the law of God and of nature, and those who indulge in such are branded with the guilt of grave sin*" (italics added) (*1*). This quotation reproduces section 56 of the encyclical in it entirety. The three sections immediately preceding it should also be consulted, for they make manifest the full intensity of the Papal condemnation.

O'Loane emphasized that "the Church is considered to have taken a doctrinal stand in a matter when she has (i) made an infallible pronouncement by the head of the Church; (ii) defined by an Ecumenical Council; (iii) authoritatively proposed some creed, formula of belief, or matter of moral behavior." Although O'Loane did not so indicate by placing the word *or* between the second and third of the criteria, each of them is a sufficient condition. Clearly, the second is not applicable to the case in point. Let us, therefore, consider the first. According to the canons of the Vatican Council of 1870, the Roman Pontiff is infallible when he speaks ex cathedra—that is, when he speaks "in discharge of the office of pastor and doctor of all Christians [*sic*]" (*2*). Referring to the text quoted above and keeping in mind that the encyclical was addressed to all the faithful, one is logically entitled to conclude that Pius XI was speaking ex cathedra. Moreover, it would be difficult to deny that the portion of the text reading "the Catholic Church . . . raises her voice in token of her divine ambassadorship and through Our mouth proclaims . . ." fulfills the third of O'Loane's criteria.

Perhaps, then, neither Sulloway nor Davis is as "deficient in philosophical and theological background" as O'Loane would have us think.

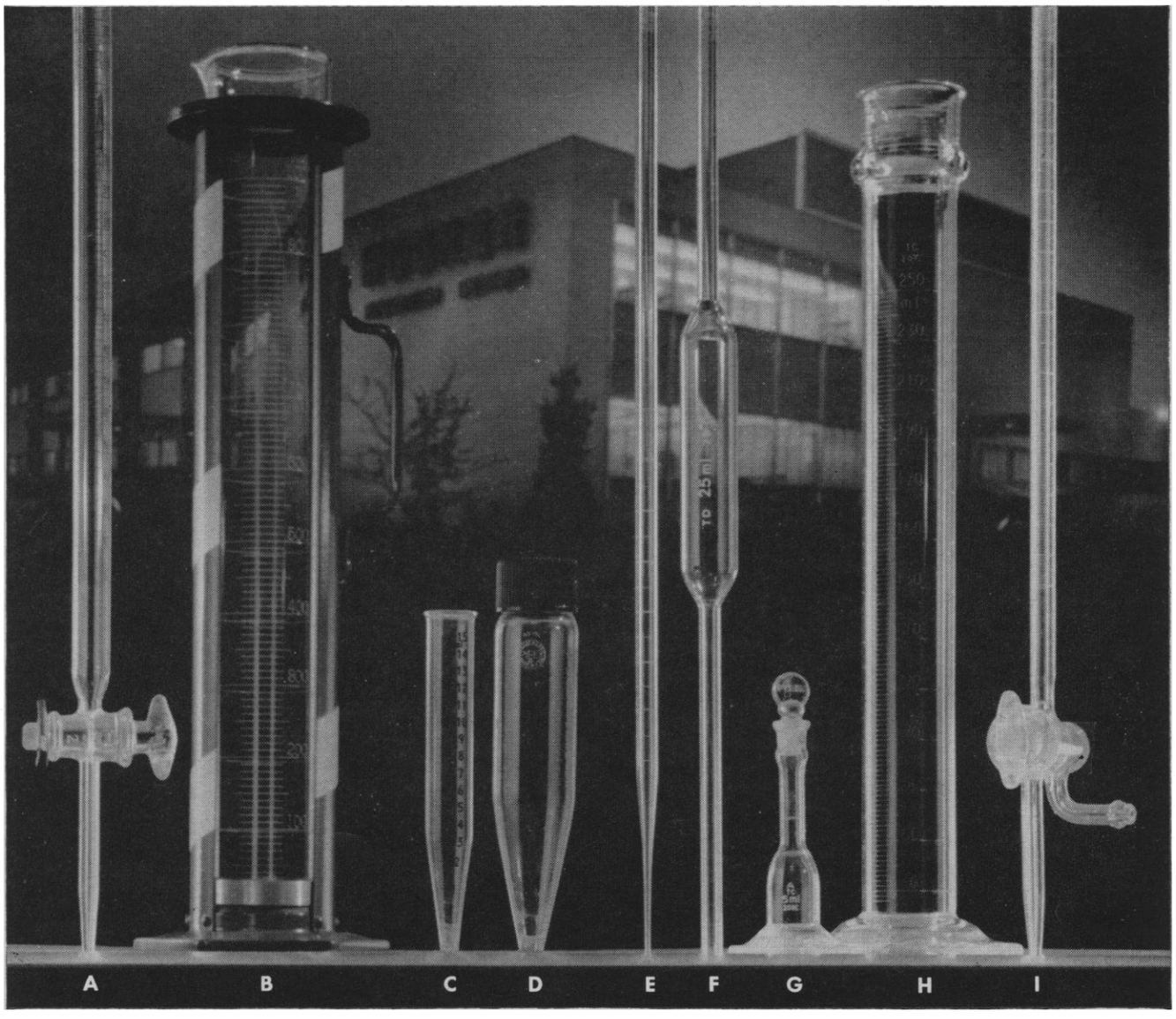
ROBERT HOFFMAN
2273 Parkhurst Road,
Elmont, New York

References

1. Pope Pius XI, "*Casti connubii*," reprinted in T. P. McLaughlin, Ed., *The Church and the Reconstruction of the Modern World* (Image Books, Garden City, N.Y., 1957), p. 136.
2. "First Dogmatic Constitution on the Church of Christ," chap. iv, reprinted in G. MacGregor, *The Vatican Revolution* (Beacon, Boston, 1957), p. 195.

In a recent issue O'Loane presents a Catholic criticism of *Science's* review of the book *Birth Control and Catholic Doctrine*. O'Loane does not like the

(Continued on page 1048)



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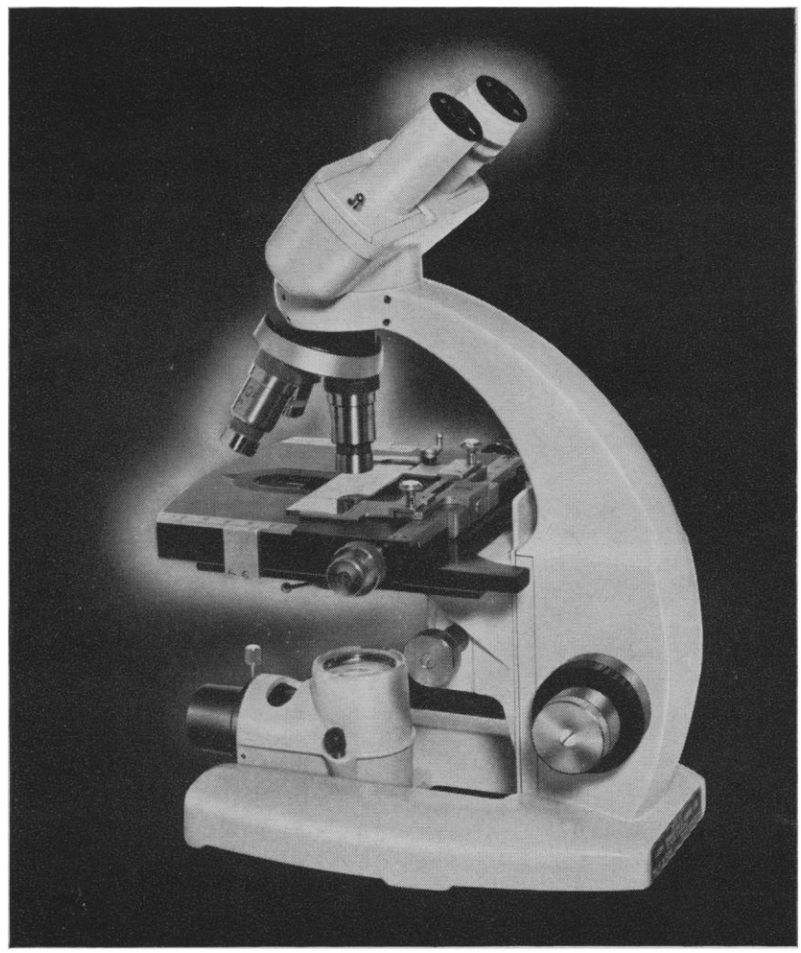

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8 April 1960, Volume 131, Number 3406

SCIENCE

SCIENCE, which is now combined with THE SCIENTIFIC MONTHLY, is published each Friday by the American Association for the Advancement of Science at National Publishing Company, Washington, D.C. The joint journal is published in the SCIENCE format. SCIENCE is indexed in the *Reader's Guide to Periodical Literature*.

Editorial and personnel-placement correspondence should be addressed to SCIENCE, 1515 Massachusetts Ave., NW, Washington 5, D.C. Manuscripts should be typed with double spacing and submitted in duplicate. The AAAS assumes no responsibility for the safety of manuscripts or for the opinions expressed by contributors. For detailed suggestions on the preparation of manuscripts and illustrations, see *Science* **125**, 16 (4 Jan. 1957).

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Between Two Extremes

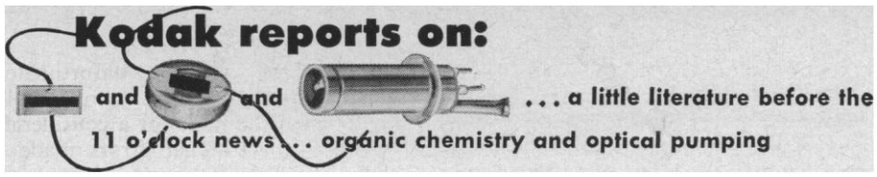
With science supporting an ever expanding military technology, many people in this country are wondering to what extent American scientists should assume responsibility for the uses to which the government puts their discoveries and talents. It has always been possible, of course, to speak of pure research, just as it has always been possible, we suppose, to speak of the pure act of sitting down to a meal and consuming it with impeccable table manners. But any piece of behavior can acquire moral properties, given the appropriate circumstances—even sitting down to eat a hamburger, as recent developments in the South have shown.

One view of the scientist's responsibility for the social consequences of scientific truths is that this responsibility ends with the scientist's willingness to do work directly or indirectly for the government, including work on weapons. According to this view, being a good scientist no more gives one special privileges in determining national policy than being a good information clerk at an airport entitles one to select destinations for travelers. The area of special competence of scientists lies in the discovery of technical facts; decisions of public policy rest with elected or appointed public officials.

An opposite opinion concerning the obligations of scientists holds that scientists should consider the possible consequences of any piece of research before it is begun, and if the research is judged more a threat to the country, or humanity at large, than a benefit, they should refuse their services. A man cannot delegate to a superior the responsibility for the moral consequences of his acts, the second view claims. To be sure, to predict future applications of new discoveries calls more for the talents of a prophet than for those of a scientist. No one now knows to what uses, or abuses, the fall of parity in physics may some day prove amenable. But somewhere along the line, basic research becomes applied research, and forecasts about the uses of discoveries become something more than anybody's guess.

Between the two opposing positions lies a third position which holds that at least some scientists, although they fear the dangers posed by a further increase in military power, have the duty to work on projects that the government deems necessary, but that scientists also have the duty to state their opinions on matters lying outside science. If this is the age of specialization, so this argument runs, it is also the age of specialists working together on teams. Public officials should have the final word, but any attempt to understand the full range of consequences—military, political, economic, and moral —of new advances in research, requires the views of the men who understand those advances best.

It is this third position that expresses our own convictions, and that seems to express the convictions of most of the persons in this country who are presently concerned with these problems—although, admittedly, agreement on general principles does not necessarily imply agreement on particular cases. The first position errs because, pushed to its conclusion, it turns the citizen's obligations to the state into despotism; while the second position errs because, if pushed, it turns the moral integrity of the individual into anarchy. The third position seeks the mean between the scientist's assuming too little responsibility for the consequences of his research and his assuming too much responsibility.—J.T.



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Metallography and other matters

You would think we had nothing better to do than write letters and be friendly, helpful, and cheerful.

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Just issued is a new one, "Photomicrography of Metals." It contains 13 pages on the metallographic microscope (unbiased toward any particular make of instrument, since we are not in that business), 3 pages on illumination, 5 on filters, 3 on photographic materials (which we do make), 5 on exposure determination, and 8 on processing and printing—just enough for thoughtful perusal between the evening paper and the 11 o'clock news. The pages are meaty; the illustrations are there to explain, not just fill space; the author (anonymous) is a photomicrographer, not an ad-writing hack.

Also just published is the 8th edition of one that has taught many thousands of people since 1933 the rock-bottom facts about the photographic emulsion as a scientific device. The title, "Kodak Photographic Films & Plates for Scientific and Technical Use," dissembles a wee bit. In the old days astronomy was regarded as too thin and unworldly a market to justify commercial literature; therefore the title was devised as a shield from the beady eyes of hard-headed accountants. They find it hard to understand that addressing ourselves to the needs of men with their minds inside stars strengthens the capabilities of photographic technology in general. Indeed, this new 8th edition contains some helpful hints from Mount Wilson and Palomar Observatories that could teach an amateur astronomer to think like a pro. The edition reveals some constriction from the sprawling diversity of *Kodak "Spectroscopic" Plates and Films* hitherto offered, and these pages show how the present lineup fills the bill.

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Man passing out dotriacontane

We have a yarn that ties in the sperm whale with relativity. It has a moral but lacks a punchy climax.

On the theory that not only is the grass greener on the other fellow's lawn but he also leads a more interesting life, we would tell the organic chemists how the atomic physicists are looking for substances against which polarized free electrons can bounce without having their spins inverted. The physicists want to coat a substance like that on the walls of evacuated glass vessels. It should have no free or unpaired electrons, no crystal structure. To an electron scooting by, such a molecule should appear magnetically inert. The small residual pressure tolerable in the vessel should be mostly of rubidium vapor and not of the non-inverting substance. Also the coating must have good transmittance at around the 8000A wavelength of the radiation fed to excite the rubidium.

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9–11. Radiation Research Soc., 8th annual San Francisco, Calif. (E. L. Powers, RRS, Argonne Natl. Laboratory, Box 299, Lemont, Ill.)

9–12. American Rocket Soc. semiannual, Los Angeles, Calif. (A. F. Denham, ARS, 925 Book Bldg., Detroit 26, Mich.)

9–12. Instrumentation Automation Conf. and Exhibit, summer, San Francisco, Calif. (Instrument Soc. of America, 313 Sixth Ave., Pittsburgh 22, Pa.)

9–13. American Psychiatric Assoc., annual, Atlantic City, N.J. (C. H. H. Branch, 156 Westminster Ave., Salt Lake City, Utah)

9–14. Fermentation, intern. symp., Rome, Italy. (Intern. Fermentation symp., Istituto Superiore di Sanita, Viale Regina Elena, 299, Rome, Italy)

10–12. Electronic Components, conf., Washington, D.C. (N. S. Hibsham, AIEE, 33 W. 39 St., New York 18)

10–12. Farm Electrification, conf., Omaha, Neb. (N. S. Hibsham, AIEE, 33 W. 39 St., New York 18)

10–12. Severe Storms, American Meteorological Conf., St. Louis, Mo. (K. C. Spengler, AMS, 45 Beacon St., Boston 8, Mass.)

10–13. Fuel Element Fabrication, symp., Vienna, Austria. (Intern. Atomic Energy Agency, 11 Kärntner Ring, Vienna)

11. Society of Medical Psychoanalysts, annual, New York, N.Y. (M. Ross, American Psychiatric Assoc., 1700 18 St., N.W., Washington 9)

11–13. American Assoc. of Genito-Urinary Surgeons, Dearborn, Mich. (W. J. Engel, 2020 E. 93 St., Cleveland 6, Ohio)

11–13. American Assoc. of Physical Anthropologists, Washington, D.C. (E. E. Hunt, Jr., Peabody Museum, Harvard Univ., Cambridge 38, Mass.)

11–13. American Assoc. for Thoracic Surgery, 40th annual, Miami Beach, Fla. (H. T. Langston, 7730 Carondelet Ave., St. Louis 5, Mo.)

11–13. American Inst. of Chemists, Minneapolis, Minn. (L. Van Doren, AIC, 60 E. 42 St., New York 17)

11–13. International Acetylene Assoc., annual, Seattle, Wash. (IAA, 30 W. 42 St., New York 17)

11–13. Quinones in Electron Transport, symp. (by invitation only), London, England. (G. E. W. Wolstenholme, Ciba Foundation, 41 Portland Pl., London, W.1)

11–13. Rare Earths in Biochemical and Medical Research, conf., Ames, Iowa. (J. G. Graca, College of Veterinary Medicine, Iowa State Univ., Ames)

11–14. American Helicopter Soc., annual, Miami Beach, Fla. (H. M. Lounsbury, AHS, 2 E. 64 St., New York 21)

11–14. National Science Fair-International, Indianapolis, Ind. (Science Service, 1719 N. St., Washington 6)

12. Protein and Amino Acid Supplementation, Chicago, Ill. [J. T. Sime (Assoc. of Vitamin Chemists), Evaporated Milk Assoc., 228 North La Salle St., Chicago 1]

12–14. American Assoc. for Cleft Palate Rehabilitation, Denver, Colo. (D. C. Spriestersbach, University Hospitals, Iowa City, Iowa)

12–14. American Inst. of Industrial Engineers, annual, Dallas, Tex. (F. J. Tittler, AIIE, 145 N. High St., Columbus 15, Ohio)

12–14. Virginia Acad. of Science, Richmond. (P. M. Patterson, Hollins College, Va.)

13–14. Proctological Latina, 2nd intern., Rome, Italy. (G. B. E. Simonetti, Via S. Raffaele 3, Milano, Italy)

15–18. American Soc. of Maxillofacial Surgeons, Los Angeles, Calif. (E. C. Hinds, 1508 Medical Towers, Houston 25, Tex.)

15–18. International College of Surgeons, 12th biennial conf., Rome, Italy. (ICS, 1516 Lake Shore Drive, Chicago, Ill.)

15–20. American Water Works Assoc., annual conv., Miami Beach, Fla. (H. E. Jordan, AWWA, 2 Park Ave., New York 16)

15–19. Institute of Food Technologists, 20th annual, San Francisco, Calif. (C. S. Lawrence, IFT, 176 W. Adams St., Chicago 3)

15–20. National Tuberculosis Assoc., Los Angeles, Calif. (J. C. Stone, 1790 Broadway, New York 19)

16–17. Society of American Military Engineers, natl. conv., Washington, D.C. (D. A. Sullivan, SAME, 140 S. Dearborn St., Chicago, Ill.)

16–18. American Opthalmological Soc., Colorado Springs, Colo. (M. C. Wheeler, 30 W. 59 St., New York 19)

16–18. American Trudeau Soc., Los Angeles, Calif. (F. W. Webster, 1790 Broadway, New York 19)

16–19. American Urological Assoc., Chicago, Ill. (W. P. Didusch, 1120 N. Charles St., Baltimore 1, Md.)

16–20. Medical Library Assoc., Kansas City, Mo. (Miss N. A. Mehne, Upjohn Co. Library, 301 Henrietta St., Kalamazoo, Mich.)

16–21. American Assoc. on Mental Deficiency, annual, Baltimore, Md. (N. A. Dayton, P.O Box 51, Mansfield Depot, Conn.)

17–18. Superconductive Technique for Computing Systems, symp., Washington, D.C. (Miss J. Leno, Code 430A, Office of Naval Research, Washington 25)

17–20. American Assoc. of Plastic Surgeons, Milwaukee, Wis. (T. D. Cronin, 6615 Travis St., Houston 25, Tex.)

18–19. Agricultural Meteorology, 3rd conf., Kansas City, Mo. (K. C. Spengler, American Meteorological Soc., 45 Beacon St., Boston, Mass.)

18–20. Society for Experimental Stress Analysis, spring, Indianapolis, Ind. (W. M. Murray, SESA, P.O. Box 168, Central Square Station, Cambridge 39, Mass.)

18–27. Wool Conf., intern., Harrogate, Yorkshire, England. (A. W. Bennett, Textile Inst., 10 Blackfriars St., Manchester 3, England)

21–22. Society for Economic Botany, 1st annual, Lafayette, Ind. (Q. Jones, New Crops Research Branch, Beltsville, Md.)

22. Maryland Acad. of Sciences, Baltimore. (J. W. Easter, Owings Mills, Md.)

22–26. Air Pollution Control Assoc., 53rd annual, Cincinnati, Ohio. (C. W. Gruber, 2400 Beekman St., Cincinnati 14)

22–26. Oil and Gas Power Conf., Kansas City, Mo. (D. B. MacDougall, ASME, 29 W. 39 St., New York 18)

(See issue of 18 March for comprehensive list)