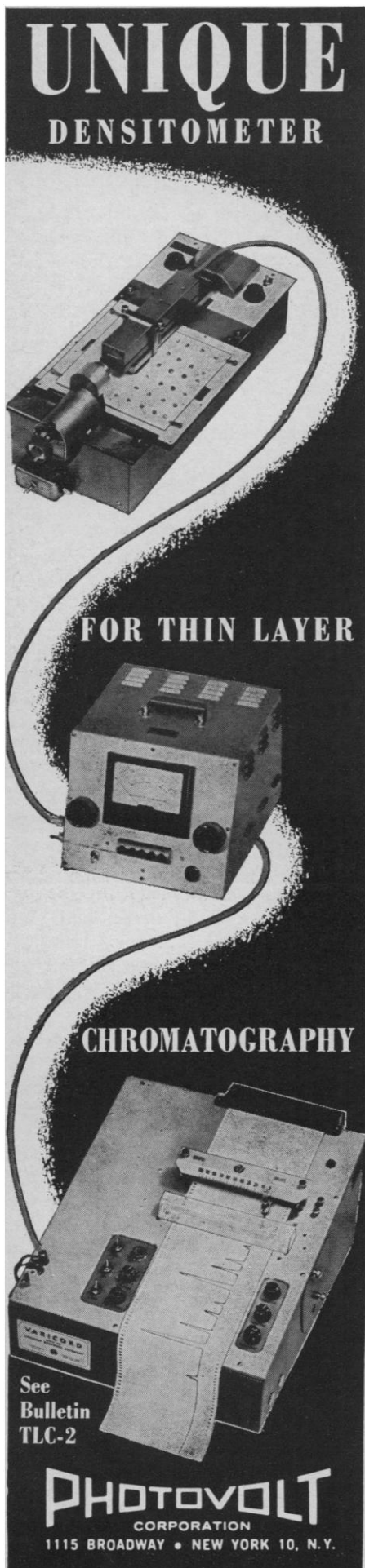


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pound dermal structures as mesectoderm inductions, derived from a modification of a fundamental structure resembling the present toothbud. Enamel is thus considered a phylogenetically old material rather than a recent invention. Moss elaborated this hypothesis and commented on such implications as the essential homology of the keratinized beak of turtles to the external portions of teeth; both were derived by modifications of the enamel organ. Amino acid analysis was stated to have established the homology of mammalian enamel, shark (denticle) enamel, the elastoidin of dermal fin rays, and the ichthylepidin of teleost scales. All are ectodermal collagens.

The active discussion elicited the comment (by Moss) that conodont fossils should, on morphologic and crystallographic grounds, be considered of nonvertebrate origin.

Robert A. Robinson (Johns Hopkins) discussed the results of studies in the ultrastructure of hard tissues. He showed that the nature of the bone matrix exhibits recognizable quantitative but not qualitative differences between most forms (differing on the family level) yet checked for this point. Analysis suggests that the osteoblasts produce a hydrated collagen fibril matrix that appears to achieve a characteristic ratio of mineral plus residual (that is, bound) matrix water to organic matter when mineralized. Distinctive ratios are obtained from hard tissues deposited on the collagen matrices formed by epiphyseal cartilage cells and odontoblasts. Calculations indicate that mineral exchange in the living animal could occur along the exposed interior surfaces of the marrow canal, the osteocyte spaces, and the canaliculi. This diffuse distribution might satisfy the mineral homeostatic needs of the animal without necessarily requiring exchange at "hot spots." "Hot spots" represent regions of very high water and low mineral content.

The studies confirm the transformation of osteoblasts into osteocytes, but as yet cannot refute the argument that osteoclasts could be alternate modifications of a primitive cell rather than manifestations of the same cell in different phases of metabolic activity.

In discussing aspects of the blood-bone continuum, Marshall R. Urist (U.C.L.A.) interpreted the physiological function of hard tissues to be one of storage. Calcified areas and body fluids then are tied into a single feed-

back cycle. He supported this with data derived from comparisons of vertebrate groups in general and of related fishes inhabiting marine and freshwater environments in particular. Calcification is believed to have arisen in fresh or brackish waters and to have served both as a storage reservoir that permitted some ionic independence and as a supporting-protecting structure. Any diffuse or localized calcification would serve for ion storage, but distinct mechanical presence of calcification was required for structural functions.

Carl Gans (State University of New York at Buffalo) was chairman of the meeting and Warren F. Walker (Oberlin) organized the symposium. Discussant was Bobb Schaeffer (American Museum of Natural History).

CARL GANS

*Department of Biology, State
University of New York at Buffalo*

Forthcoming Events

April

21-24. American Geophysical Union, Washington, D.C. (AGU, 1515 Massachusetts Ave., NW, Washington, D.C.)

22-24. Institute of Electrical and Electronics Engineers, 16th annual southwestern conf., Dallas, Tex. (F. E. Brooks, Jr., Military Electronics Div., Ling Temco Vought, P.O. Box 6118, Dallas 75222)

22-24. British Inst. of Radiology, 25th congr., London, England. (British Institute of Radiology, 32 Welbeck St., London, W.1)

22-25. National Council of Teachers of Mathematics, Miami Beach, Fla. (H. T. Karnes, Dept. of Mathematics, Louisiana State Univ., Baton Rouge 3)

23-25. American Gastroenterological Conv., Philadelphia, Pa. (C. E. Nelson, 313 N. First St., Ann Arbor, Mich.)

27-1. Photographic Science and Engineering, intern. conf., New York, N.Y. (W. Clark, Eastman Kodak Laboratories, Rochester, N.Y. 14650)

28-1. Dallas-Southwest Industrial Trade Fair, Dallas, Tex. (C. L. Wells, P.O. Box 26010, Dallas 26)

29-1. Acoustical Fatigue, 2nd intern. conf., Dayton, Ohio. (D. M. Forney, Research and Technology Div., U.S. Air Force Systems Command, Wright-Patterson Air Force Base, Dayton)

29-2. Peaceful Uses of Space, 4th natl. conf., Boston, Mass. (G. A. Rogovin, 501 Boylston St., Boston 16)

29-2. American Thyroid Assoc., annual, Rochester, Minn. (T. Winship, ATA, 110 Irving St., NW, Washington, D.C. 20010)

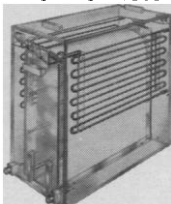
30-1. Institute of Hospital Administrators, annual, Edinburgh, Scotland. (IHA, 75 Portland Place, London, W.C.1, England)

30-1. Zonal Centrifugation Systems, Oak Ridge, Tenn. (F. C. Von der Lage,

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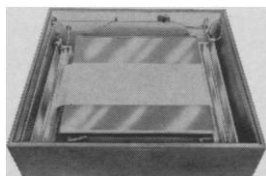
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Office of Industrial Cooperation, Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn. 37831)

30-2. **Agricultural History Soc.**, annual, Cleveland, Ohio. (A. G. Bogue, History Dept., Univ. of Iowa, Iowa City)

30-2. **American Cleft Palate Assoc.**, 22nd annual, Los Angeles, Calif. (ACPA, Parker Hall, Univ. of Missouri, Columbia 65202)

30-2. **Midwestern Psychological Assoc.**, 36th annual, St. Louis, Mo. (F. A. Mote, Psychology Dept., Univ. of Wisconsin, Madison 53706)

30-3. **Wilson Ornithological Soc.**, Kalamazoo, Mich. (P. B. Hofslund, Biology Dept., Univ. of Minnesota, Duluth)

30-6. **Mexican Natl. Acad. of Medicine**, Mexico City. (A. Lavarez-Bravo, Unidad de Congresos del Centro Mexico, Bloque “B”, Av. Chauhtenoc 330, Mexico, D.F.)

May

1. **Chemical Inst. of Canada, Rubber Chemistry Div.**, annual, Niagara Falls, Ont. (CIC, 48 Rideau St., Ottawa, Ont.)

1-2. **American Type Culture Collection**, symp., Washington, D.C. (W. A. Clark, 12301 Parklawn Dr., Rockville, Md.)

1-2. **Association of Clinical Scientists**, Philadelphia, Pa. (R. P. MacFate, 54 W. Hubbard St., Chicago, Ill. 60610)

1-2. **Minnesota Acad. of Science**, Moorhead. (M. R. Boudrye, 3100 38th Ave. S., Minneapolis 6, Minn.)

1-2. **Nebraska Acad. of Sciences**, Lincoln. (C. B. Schultz, 101 Morrill Hall, Univ. of Nebraska, Lincoln 8)

1-2. **North Dakota Acad. of Science**, Fargo. (B. G. Gustafson, Univ. of North Dakota, Extension Div., Grand Forks)

1-3. **Society of Biological Psychiatry**, Los Angeles, Calif. (H. E. Himwich, SBP, Galesburg State Research Hospital, Galesburg, Ill.)

1-3. **Wisconsin Acad. of Sciences, Arts, and Letters**, annual, Wausau. (W. E. Scott, 1721 Hickory Dr., Madison, Wis.)

1-4. **American Psychoanalytic Assoc.**, annual, Los Angeles, Calif. (Mrs. H. Fischer, APA, 1 E. 57 St., New York N.Y. 10022)

2-3. **Academy of Psychoanalysis**, annual, Los Angeles, Calif. (J. R. Royce, The Academy, 125 E. 65 St., New York, N.Y. 10021)

3-7. **Electrochemical Society**, spring meeting, Toronto, Ont., Canada. (ES, 30 E. 42 St., New York, N.Y. 10017)

3-7. **American Soc. for Microbiology**, annual, Washington, D.C. (American Inst. of Microbiology, 115 Huron View Blvd., Ann Arbor, Mich.)

3-9. **Medical Biological Congr.**, Mutters, Austria. (P. Newhäuser, Abilindastr. 52a, München-Gräfelfing, Germany)

4-5. **Bioengineering**, 1st annual Rocky Mountain symp., U.S. Air Force Acad., Colorado Springs, Colo. (R. J. Gowan, Dept. of Electrical Engineering, U.S. Air Force Acad., Colorado Springs 80840)

4-5. **Chemical and Petroleum Instrumentation**, 5th natl. symp., Instrument Soc. of America, Wilmington, Del. (G. H. Robinson, Engineering Dept., E. I. duPont de Nemours Co., Wilmington)

4-6. **Instrument Soc. of America, Bio-medical Sciences Div.**, 2nd natl. symp.,

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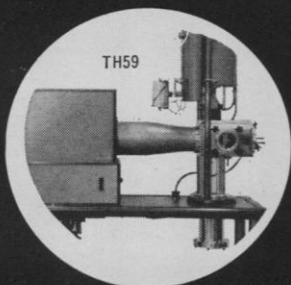
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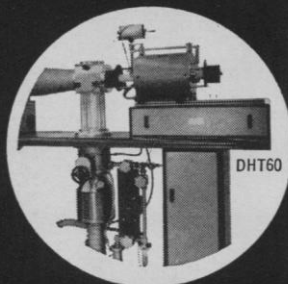
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Albuquerque, N.M. (R. F. Rust, Brooks, Feeger Assoc., 1238 Ortiz S.E., Albuquerque)

4-6. American Inst. of Aeronautics and Astronautics, **Aerospace Propulsion** meeting, Cleveland, Ohio. (AIAA, 500 Fifth Ave., New York, N.Y. 10036)

4-6. Aerospace **Instrumentation**, 10th natl. symp., Instrument Soc. of America, New York, N.Y. (ISA, 530 William Penn Pl., Pittsburgh 19, Pa.)

4-6. Asymptotic Solutions of **Differential Equations** and Their Applications, symp., Madison, Wis. (C. Wilcox, Mathematics Research Center, Univ. of Wisconsin, Madison 53706)

4-6. American Soc. for **Quality Control**, 18th annual conv., Buffalo, N.Y. (ASQC, 161 West Wisconsin Ave., Milwaukee 3, Wis.)

4-6. Inhaled **Radioactive Particles and Gases**, symp., Richland, Wash. (W. J. Bair, Biology Laboratory, Hanford Laboratories, Richland, Wash.)

4-7. **Biomedical Sciences Instrumentation**, 2nd natl. symp., Instrument Soc. of America, Univ. of New Mexico, Albuquerque. (P. F. Salisbury, St. Joseph Hospital, 501 S. Buena Vista St., Burbank, Calif.)

4-8. American **Psychiatric Assoc.**, 120th annual, Los Angeles, Calif. (W. E. Barton, 1700 18th St., NW, Washington, D.C.)

4-8. **Strata Control and Rock Mechanics** intern. conf., New York, N.Y. (S. Boshkov, School of Mines, Columbia Univ., New York, N.Y.)

4-22. United Nations Commission on **Narcotic Drugs**, 19th session, Geneva, Switzerland. (UN, Palais des Nations, Geneva)

5-6. **Human Factors in Electronics**, 5th natl. symp., San Diego, Calif. (M. Freitag, 1910 Shire Dr., El Cajon, Calif.)

5-7. **Electronic Components Conf.**, Washington D.C. (J. Bohrer, 401 N. Broad St., Philadelphia, Pa.)

5-9. **Nuclear Radiation Hazards**, intern. symp., Intern. Civil Defence Organization, Monaco. (ICDO, 28 avenue Pictet-de-Rochemont, Geneva, Switzerland)

5-9. **Virginia Acad. of Science**, Charlottesville. (R. C. Berry, P.O. Box 8315, Richmond, Va.)

6-7. **Laser/Electron Beam**, seminar, Chicago, Ill. (R. Aptekar, Information Services Dept., American Soc. of Tool and Manufacturing Engineers, 10700 Puritan Ave., Detroit, Mich. 48238)

6-7. **Optical Masers Symp.**, Toronto, Ont., Canada. (R. N. Hall, General Electric Research Laboratory, P.O. Box 1088, Schenectady, N.Y.)

6-8. American Assoc. of **Genito-urinary Surgeons**, Rye, N.Y. (2020 93rd St., Cleveland 6, Ohio)

6-8. **Psychosomatic Research**, European conf., Athens, Greece. [G. S. Philippopoulos, 4 Monis Petraki St., Athens (140)]

6-8. Society for **Experimental Stress Analysis**, spring meeting, Salt Lake City, Utah. (B. E. Bossi, 21 Bridge Sq. Westport, Conn.)

6-9. **Acoustical Soc. of America**, 66th spring meeting, New York, N.Y. (W. Waterfall, 335 E. 45 St., New York, N.Y.)

7-8. **Vacuum Microbalance Techniques**, 4th conf., Pittsburgh, Pa. (F. A. Brassart,

Westinghouse Research and Development Center, Beulah Rd., Pittsburgh 35)

7-8. International College of **Surgeons**, British section, summer meeting, London. (Secretariat, 1516 Lake Shore Dr., Chicago, Ill. 60610)

7-9. Society for American **Archaeology**, 30th, Chapel Hill, N.C. (W. H. Sears, Florida State Museum, Gainesville)

7-9. Society of **Neurological Surgeons**, Rochester, Minn. (SNS, Duke Univ. Medical Center, Durham, N.C.)

7-10. International Assoc. for **Bronchology**, 14th congr., Vienna, Austria. (Secretariat, Vienna Acad. of Medicine, 4, Alserstr., Vienna 9)

8-9. **Colorado-Wyoming Acad. of Science**, Denver, Colo. (Mrs. C. Norton, Dept. of Botany, Colorado State Univ., Fort Collins)

8-9. **North Carolina Acad. of Science**, Davidson. (J. A. Yarbrough, Meredith College, Raleigh, N.C.)

8-9. **Surgical Research Soc.**, Sheffield, England. (A. P. M. Forrest, Surgical Unit, Cardiff Royal Infirmary, Newport Rd., Cardiff, South Wales)

8-9. **Surface Physics**, Washington State Univ. Pullman. (E. E. Donaldson, Physics Dept., Washington State Univ., Pullman)

8-20. **Space Research**, 7th plenary meeting, ICSU committee, Florence, Italy. (E. R. Dyer, Jr., National Acad. of Sciences-National Research Council, 2101 Constitution Ave., Washington, D.C.)

10-14. **Cardiology**, 3rd Asian-Pacific congr., Kyoto, Japan. (S. Hayase, Medical Clinic, Kyoto Univ. Hospital, Sakyo-ku, Kyoto)

10-14. French Soc. of **Ophthalmology**, 71st congr., Paris. (M. A. Dollfus, Société Française d'Ophthalmologie, 27, rue du Faubourg-Saint-Jacques, Paris 16^e)

10-14. American **Proctologic Soc.**, Philadelphia, Pa. (APS, 7815 East Jefferson, Detroit 14, Mich.)

10-15. **Photographic Science and Engineering**, intern. conf., Palisades Park, N.J. (Executive Secretary, Soc. of Photographic Scientists and Engineers, Box 1609, Main Post Office, Washington, D.C.)

11-13. **Aerospace Electronics**, 16th natl. conf., Dayton, Ohio. (Y. Jacobs, 1917 Burbank Dr., Dayton 45406)

11-14. Society for **Industrial and Applied Mathematics**, spring meeting, Washington, D.C. (SIAM, Box 7541, Philadelphia 1, Pa.)

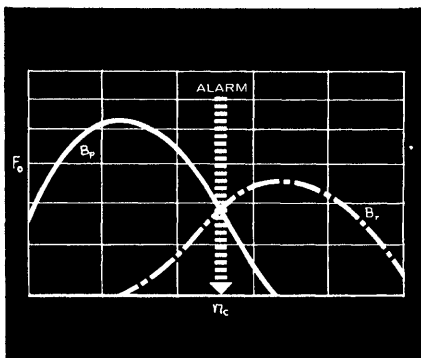
11-14. American **Urological Assoc.**, annual, Pittsburgh, Pa. (AUA, 1120 North Charles St., Baltimore, Md.)

11-16. Assessment of **Radioactive Body Burdens** in Man, symp., IAEA, Heidelberg, Germany. (IAEA, Div. of Public Information Kärntnerring 11, Vienna, Austria.)

11-14. **Aerospace Medical Assoc.**, 35th annual, Bal Harbour, Fla. (W. J. Kennard, c/o Washington Natl. Airport, Washington, D.C. 20001)

11-14. **Biological Editors**, conf., Ann Arbor, Mich. (R. L. Zwemer, Committee on European Editors, c/o American Physiological Soc., 9650 Wisconsin Ave., Bethesda, Md. 20014)

11-16. International College of **Surgeons**, 14th intern. congr., Vienna, Austria. (S. E. Henwood, 1516 Lake Shore Dr., Chicago, Ill. 60610)



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12. American Inst. of Chemical Engineers. tri-sectional symp., Newark, N.J. (R. H. Dodds, Gibbs & Hill, Inc., 393 Seventh Ave., New York, N.Y.)

13-14. Society of Plastics Engineers, plastics in space, conf., Garden City, N.J. (D. Hassel, Grumman Aircraft Engineering Corp., Bethpage, L.I., N.Y.)

13-15. Biomathematics and Computer Science in the Life Sciences, 2nd annual symp., Houston, Tex. (Univ. of Texas Graduate School of Biomedical Sciences, 102 Jesse Jones Bldg., Texas Medical Center, Houston 77025)

13-15. Society of Professional Well Log Analysts, 5th intern. symp., Midland, Tex. (F. Wheeler, SPWLA, P.O. Box 4713, Tulsa 14, Okla.)

14-15. Radiochemical Processing Symp., Buffalo, N.Y. (R. F. Lumb, Western New York Nuclear Research Center, Power Drive, Buffalo 14214)

14-15. Scandinavian Biochemistry Meeting, Stockholm, Sweden. (Sveriges Biokemiska Förenig, Karolinska Inst., Stockholm 60)

14-16. American Inst. of Industrial Engineers, 15th annual conf., Philadelphia, Pa. (W. J. Jaffe, Dept. of Management Engineering, Newark College of Engineering, Newark, N.J.)

14-16. Central States Anthropological Soc., annual, Milwaukee, Wis. (N. O. Lurie, Dept. of Anthropology, Univ. of Wisconsin, Milwaukee 11)

14-16. Society of Technical Writers and Publishers, 11th annual conv., San Diego, Calif. (C. M. Johnson, U.S. Navy Electronics Laboratory, San Diego 92132)

16-2. European Energy Conf., Paris, France. (H. Perdon, Institut Français des Combustibles et de l'Energie, 3, rue Henri-Heine, Paris 16^e)

17-20. American Inst. of Chemical Engineers. natl. meeting, Pittsburgh, Pa. (F. J. Van Antwerpen, 345 E. 47 St., New York, N.Y. 10017)

18-20. Radiation Research Soc., 12th annual, Miami Beach, Fla. (G. D. Adams, Radiological Laboratory, Univ. of California Medical Center, San Francisco 22)

18-20. Water, 2nd conf., Technical Assoc. of the Pulp and Paper Industry, Green Bay, Wis. (H. O. Teeple, TAPPI, 360 Lexington Ave., New York, N.Y.)

18-21. Society of Economic Paleontologists and Mineralogists, Toronto, Ont., Canada. (R. H. Dott, Box 979, Tulsa 1, Okla.)

18-21. American Assoc. of Petroleum Geologists, 49th annual conv., Toronto, Ont., Canada. (R. E. King, American Overseas Petroleum, Ltd., 485 Lexington Ave., New York, N.Y. 10017)

19-20. Council on Medical Television, 6th annual, Atlanta, Ga. (S. A. Agnello, Duke Univ. Medical Center, Box 3163, Durham, N.C. 27706)

19-21. Microwave Theory and Techniques, intern. symp., New York, N.Y. (H. L. Browman, Airborne Instruments Laboratory, Deer Park, N.Y. 11729)

19-22. German Metallurgical Soc., general assembly, Bremen. (Deutsche Gesellschaft für Metallkunde, An der Alteburger Mühle 12, Köln-Marienburg, Germany)

19-22. German Soc. for Applied Optics, 65th, Gmunden am Traunsee. (H. Volkman, Deutsche Gesellschaft für Ange-

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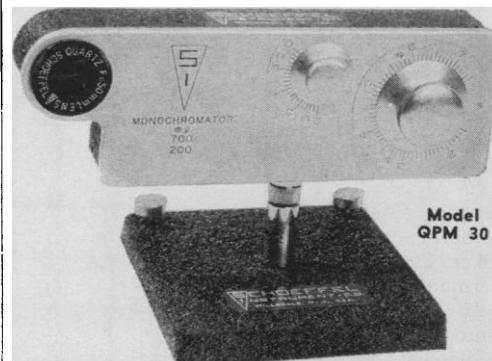
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3. Engineering Aspects of Grassland Agriculture
4. Forage Utilization and Related Animal Nutrition Problems
5. Evaluation of the Nutritive Significance of Forages
6. Grassland Climatology
7. Ecology of Grasslands
8. Range Management

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19-23. **Energy Metabolism**, 3rd symp., Ayr, Scotland. (European Assoc. for Animal Production, Corso Trieste, 67, Rome, Italy)

19-30. International **Electrotechnical Commission**, general meeting, Aix-les-Bains, France. (American Standard Assoc., 10 E. 40 St., New York 16)

20. Memorial Hospital of Long Beach, **medical staff symp.**, Long Beach, Calif., (G. X. Trimble, 2801 Atlantic Ave., Long Beach 6)

20-23. Canadian Assoc. of **Geographers**, 14th annual, London, Ont. (CAG, P.O. Box 421, Ottawa, Ont., Canada)

20-27. **Air Pollution**, European conf., Strasbourg, Austria (A. Stern, Div. of Air Pollution, U.S. Public Health Service, Washington, D.C. 20201)

20-28. Modern Methods for **Analysis of Organic Compounds**, symp., Eindhoven, Netherlands. (Gesellschaft Deutscher Chemiker, Postfach 9075, Frankfurt-am-Main, Germany)

21-22. American **Geological Inst.**, Toronto, Ont., Canada. (D. M. Kinney, U.S. Geological Survey, Washington, D.C.)

21-22. Southern **Textile Research Conf.**, Hilton Head Island, S.C. (American Assoc. of Textile Chemists and Colorists, P.O. Box 886, Durham, N.C.)

21-23. **Minerals**, 9th annual symp., Moab, Utah. (J. C. Fox, Soc. of Mining Engineers, 345 E. 47 St., New York, N.Y.)

21-23. California Soc. of **Professional Engineers**, annual, Palm Springs, Calif. (J. C. Huisking, 970 Hillcrest Dr., Pomona, Calif.)

23-24. **Radiosensitizers and Radioprotective Drugs**, 1st intern. symp., Milan, Italy. (R. Paoletti, Pharmacology Inst., Via A. del Sarto, 21, Milan)

24-28. Near and Middle East **Medical conf.**, Istanbul, Turkey. (P. Ponthus, Institut de Radiologie et de Lutte Contre le Cancer, Hotel-Dieu de France, Beirut, Lebanon)

24-29. International Federation for **Information Processing**, global conf., New York, N.Y. (A. P. Speiser, I.B.M. Research Laboratory, Zurichstr. 108, Adliswil-Zurich, Switzerland)

25. **Organic Solid State**, 2nd symp., Franklin Inst., Philadelphia, Pa. (M. M. Labes, Franklin Inst. Laboratories, 20th and The Parkway, Philadelphia 3)

25-27. American **Gynecological Soc.**, Hot Springs, Va. (AGS, 3800 Reservoir Rd., Washington, D.C. 20007)

25-27. **Power Reactors and Radioisotopes**, Canadian Nuclear Assoc., Toronto, Ont. (CNA, 19 Richmond St. West, Toronto 1, Ont.)

25-29. Society of **Physical Chemistry**, 14th annual, Bordeaux, France. (G. Emshwiller, Soc. de Chimie physique, 10, rue Vauquelin, Paris 5^e, France)

26-29. **Water Studies**, 17th intern. conf., Liège, Belgium. (Cebedeau—Journées 1964, 2, rue A. Stevart, Liège)

27-29. American **Ophthalmological Soc.**, Hot Springs, Va. (AOS, 108 E. 68 St., New York, N.Y. 10021)

27-29. Canadian **High Polymer Forum**, 12th, Ste. Marguerite, Quebec. (H. Daoust, Dept. of Chemistry, University of Montreal, P.O. Box 6128, Montreal, P.Q.)

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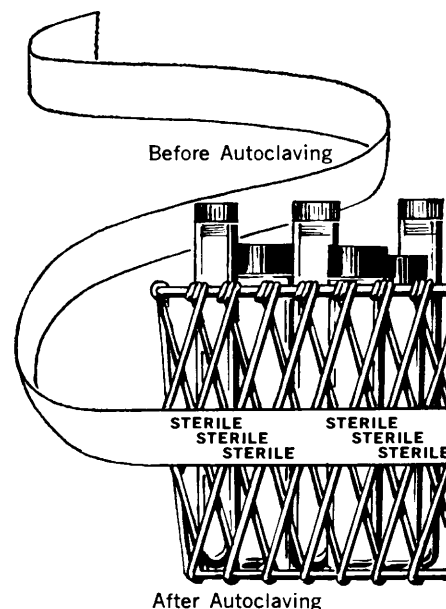
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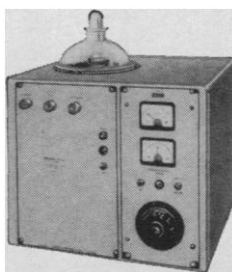
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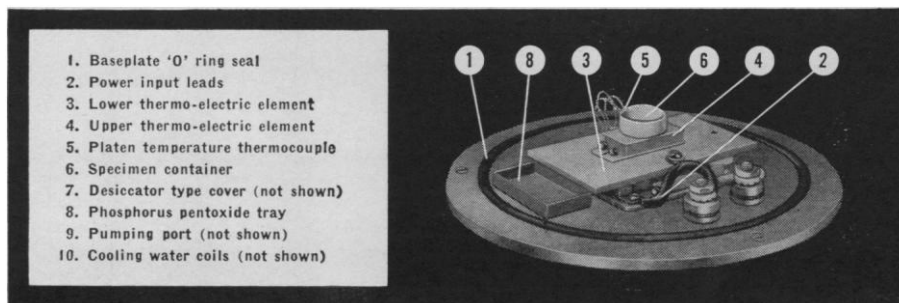


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