

CONTENTS

	Page
APS Membership Status	261
Future Meetings	265
Memorandum on Program Planning ... F. F. Jöbsis	266
The American Physiological Society	267
IV International Biophysics Congress	276
Past-President's Address ... A. Clifford Barger	277
Dedication of the Raymond J. Hock Room at the Laboratory of Environmental Patho-Physiology	286
Sir Joseph Barcroft Centenary Symposium on Fetal and Neonatal Physiology	286
Innovative Educational Techniques in Physiology Teaching ... Orr E. Reynolds	287
Computerized Systems for Indexing and Retrieving Information in Physiology Journals ... Constantine J. Gillespie	289
Senior Physiologists	299
Wallace O. Fenn	301
NRC Research Associateship Programs	303
New Medical Schools	303
IV International Congress of Endocrinology	304
Cardiac Metabolism	304
Satellite Symposium	305
Need for Photographs	305
Errata	305

APS MEMBERSHIP STATUS

September 1971

Active Members	3422
Retired Members	208
Honorary Members	17
Associate Members	338
Retired Associate	1
	<hr/> 3986

DEATHS SINCE SPRING MEETING 1971

Konrad J. K. Buettner - 11/14/70 - Prof. Atmospheric Science, Univ. of Washington, Seattle
 Robert W. Bullard - 6/24/71 - Prof., Dept. Anat. & Physiol., Indiana Univ.
 Thorne M. Carpenter (R) - 1/27/71 - Retired 1945 as Dir. of Nutrition Lab., Boston
 George O. Gey - 11/8/70 - Dir., Cancer Research Lab., John Hopkins
 Helen T. Graham (R) - 4/7/71 - Prof. Em. & Lecturer, Pharmacology, Washington Univ.
 Hans H. Hecht - 8/12/71 - Prof. of Medicine, Univ. of Chicago
 Bernard Metz - 6/7/71 - Prof. Physiol., Medical Univ. of South Carolina
 William T. Niemer - 1/11/71 - Prof. of Anatomy, Creighton Univ.
 Leslie F. Nims - 6/4/71 - Sr. Physiologist, Brookhaven Natl. Lab.
 William E. Petersen - 3/13/71 - Prof. Em., Div. Dairy Husbandry, Univ. of Minnesota
 Frederic R. Steggerda - 5/7/71 - Prof. of Physiol., Univ. of Illinois
 James A. F. Stevenson - 7/23/71 - Dean Grad. Studies, Prof. Physiol., Univ. of Western Ontario

NEWLY ELECTED MEMBERS

The following, nominated by the Council, were elected to membership in the American Physiological Society at the Fall Meeting, 1971.

FULL MEMBERS

APPERT, Hubert E.: Asst. Prof. Physiol. & Biophys., Hahnemann Med. Coll.
 BALAGURA, Saul: Asst. Prof. Psychol., Univ. of Chicago
 BALLARD, Kathryn W.: Res. Assoc., Physiol., Univ. of Southern California
 BARATZ, Robert A.: Asst. Prof. Anesthesiol., Columbia Univ.
 BAUM, David: Assoc. Prof. Pediat., Univ. of Washington Sch. Med.
 BAUMBER, John S.: Asst. Prof. Physiol., Univ. of Calgary
 BEFLER, George W. Jr.: Instr. & Consult. Physiol., Mayo Grad. Sch. Med.
 BEHRMAN, Harold R.: Assoc. in Physiol., Harvard Med. Sch.
 BELL, Richard D.: Asst. Prof. Physiol., Univ. of Oklahoma Sch. Med.
 BERKOWITZ, Jesse M.: Res. Asst. Prof. Physiol., Mt. Sinai Sch. Med.
 BOTTOMS, Gerald D.: Assoc. Prof. Physiol., Purdue Univ. Sch. Vet. Science & Med.

- BOYD, William H.: Assoc. Prof. Biomed. Sci., Univ. of Guelph
 BRANDT, Philip W.: Assoc. Prof. Anat., Columbia Univ.
 COLWELL, John A.: Assoc. Prof. Med., Northwestern Univ. Med. Sch.
 D'AGROSA, Louis S.: Asst. Prof. Physiol., St. Louis Univ. Sch. Med.
 DEAVERS, Stephanie I.: Res. Assoc. Physiol., Baylor Coll. of Med.
 DE WEER, Paul: Asst. Prof. Biophys., Univ. of Maryland Sch. Med.
 Di BONA, Gerald F.: Asst. Prof. Med., Univ. of Iowa Coll. Med.
 DICKSON, William M.: Prof. Vet. Physiol., Washington State Univ.
 DIERSCHKE, Donald J.: Spec. Res. Fellow, Physiol., Univ. Pittsburgh
 DYCK, Walter P.: Chrmn., Dept. Res., Scott & White Clinic
 EASTER, Stephen S. Jr.: Asst. Prof. Zool., Univ. of Michigan
 FERRARIO, Carlos M.: Staff, Res. Div., Cleveland Clinic Fndn.
 FIDONE, Salvatore J.: Asst. Prof. Physiol., Univ. of Utah Coll. Med.
 FIFKOVA, Eva: Sr. Res. Fellow, California Inst. of Technology
 FOX, Edward L.: Assoc. Prof., Exercise Physiol. Res. Lab., Ohio State Univ.
 FRANCESCONI, Ralph P.: Res. Chemist, U.S. Army Res. Inst. Environ. Med.
 FRANZ, Gunter N.: Asst. Prof. Physiol. & Biophys., West Virginia Univ.
 GAMBLE, Walter J.: Asst. Prof. Pediat., Harvard Med. Sch.
 GLAZIER, Jon B.: Asst. Prof. Med., Univ. of California, S. F.
 GOETZ, Kenneth L.: Dir. Exptl. Med., St. Lukes Hosp., Kansas City
 GOLDNER, Andrew M.: Asst. Prof. Human Physiol., Univ. California, Davis
 GONTIER, Jean R.: Assoc. Prof. Physiol., Univ. of Montreal
 GOODNER, Charles J.: Assoc. Prof. Med., Univ. of Washington
 GRAY, Sarah D.: Assoc. in Physiol., Mt. Sinai Sch. of Med., N. Y.
 GROB, Howard S.: Assoc. Prof. Physiol., New York Univ. Coll. Dent.
 GRUNDY, Scott M.: Chief, Cl. Res. Sect., Phoenix Indian Med. Ctr.
 GUENTER, Clarence A.: Assoc. Prof. Med. & Physiol., Univ. of Oklahoma Med. Ctr.
 GURTNER, Gail H.: Asst. Prof. Environ. Med., Johns Hopkins Univ.
 HAMILTON, Charles L.: Assoc. Prof. Physiol., Univ. Pennsylvania
 HAST, Malcolm H.: Assoc. Prof. & Dir. Res., Northwestern Univ.
 HEISTAD, Donald D.: Asst. Prof. Med., Univ. of Iowa
 HERSEY, Stephen J.: Asst. Prof. Physiol., Emory Univ.
 HIATT, Nathan: Asst. Prof. Anatomy, UCLA
 HOGG, James C.: Sr. Asst. Resident in Pathol., McGill Univ.
 HORWITZ, Lawrence D.: Asst. Prof. Med., Univ. of Texas Southwestern Med. Sch.
 HYMER, Wesley C.: Assoc. Prof. Biol., Pennsylvania State Univ.
 IKEDA, Kazuo: Sr. Res. Scientist, City of Hope National Med. Ctr.
 JAHAN-PARWAR, Behrus: Asst. Prof. Physiol., Clark Univ.
 JOB, Donald D.: Sr. Physiologist, Lilly Res. Labs., Indianapolis
 JUNG, Chan Y.: Asst. Prof. Biophysical Sci., State Univ. N.Y., Buffalo
 KAMBERI, Ibrahim: Asst. Prof. Physiol., Univ. of Texas Southwestern
 KATZ, Adrian I.: Asst. Prof. Med., Univ. of Chicago
 KENNER, Thomas J.: Assoc. Prof. Div. Biomed. Eng., Univ. Virginia
 KIMBERG, Daniel V.: Assoc. Prof. Med., Harvard Med. Sch.
 KING, Thomas K. C.: Asst. Prof. Med., Cornell Univ. Med. Coll.
 KITAI, Stephen T.: Assoc. Prof. Anat., Wayne State Univ.
 KROVETZ, L. Jerome: Assoc. Prof. Pediat., Johns Hopkins Hosp.
 LABAY, Peregrina C.: Asst. Prof. G.U. Surg. & Anat., Wash. Univ.

- LABRIE, Fernand: Assoc. Prof. Physiol., Laval Univ.
- LAKS, Michael M.: Sr. Res. Scientist, Cardiol., Cedars of Lebanon Hosp.
- LeFEVRE, Marian E.: Assoc. Physiol., Mt. Sinai Med. Sch.
- LLUCH, Salvador: Res. Assoc., C.V. Inst., Michael Reese Hosp.
- McCOY, Elbert J.: Asst. Prof. Physiol., Temple Univ. Sch. Med.
- McFADDEN, Edward R. Jr.: Asst. Prof. Med., Univ. of Texas Med. Br., El Paso
- MARCO, Luis A.: Res. Assoc. Neurol., Columbia Univ., Coll. P & S
- MARK, Allyn L.: Asst. Prof. Int. Med., Univ. of Iowa
- METCOFF, Jack: Prof. Pediat., Univ. of Oklahoma Med. Ctr.
- MICHIE, David D.: Asst. Prof. Physiol., Univ. of Miami Sch. Med.
- MILBURN, Nancy S.: Assoc. Prof. Biol., Tufts Univ.
- MINES, Allan H.: Asst. Prof. Physiol., Univ. California, S. F.
- MORISSET, Jean A.: Assoc. Prof. Biol., Sherbrooke Univ.
- NAKA, Ken-Ichi: Res. Assoc. Div. Biol. & Appl. Sci., California Inst. Technology
- NAKAJIMA, Shigehiro: Assoc. Prof. Biol. Sci., Purdue Univ.
- NARULA, Onkar S.: Staff Physician, Cardiopul. Lab., Mt. Sinai Hosp., Miami Beach
- NEWBERRY, Peter D.: Project Officer, C.V. Physiol., Canadian Forces Inst. Environ. Med.
- NIEMIAROWSKI, Stefan: Assoc. Prof. Pathol., McMaster Univ.
- OVERBECK, Henry W.: Assoc. Prof. Physiol. & Med., Michigan State Univ.
- PATERSON, Christopher A.: Asst. Prof. Physiol., Univ. of Colorado Med. Ctr.
- PENEFSKY, Zia J.: Asst. Prof. Physiol., Mt. Sinai Sch. Med., N. Y.
- PLOTKA, Edward D.: Res. Sci., Marshfield Cl. Fndn. for Med. Res. & Education, Inc.
- RAMALEY, Judith A.: Asst. Prof. Anat.-Physiol., Indiana Univ.
- RINARD, Gilbert A.: Asst. Prof. Physiol., Emory Univ.
- ROBERTS, John S.: Asst. Prof. Physiol., Case Western Reserve Univ.
- ROLETT, Ellis L.: Assoc. Prof. Med., Univ. of North Carolina
- ROSENZWEIG, David Y.: Asst. Prof. Med., Med. Coll. of Wisconsin
- ROSOFF, Betty: Assoc. Prof. Biol., Yeshiva Univ.
- ROWELL, Hugh F.: Assoc. Prof. Zool., Univ. California, Berkeley
- SAMPSON, Sanford R.: Asst. Prof. Pharmacol., Univ. California, S. F.
- SANDERS, Charles A.: Assoc. Prof. Med., Harvard Med. Sch.
- SAYEED, Mohammed M.: Asst. Prof. Physiol., Washington Univ.
- SCHIMMEL, Richard J.: Instr. Physiol., Univ. of Pittsburgh
- SCHMEER, Sr. Arline C.: Assoc. Prof. & Dir. Res., Ohio Dominican College
- SIMINOFF, Robert: Assoc. Prof. Physiol., Meharry Med. Coll.
- SLONIM, Nathaniel B.: Dir. Cardiopul. Diag. Lab., Denver, Colo.
- SPITZER, Judy A.: Res. Asst. Prof. Physiol. & Biophys., Hahnemann Med. Coll.
- STARK, Paul: Res. Sci., Pharmacol., Eli Lilly & Co.
- STEIN, Paul D.: Assoc. Prof. Med., Univ. of Oklahoma
- STEINER, Manfred: Asst. Prof. Med., Brown Univ.
- STEVENS, Charles F.: Assoc. Prof. Physiol. & Biophys., Univ. of Washington Sch. Med.
- STEVENS, Walter: Assoc. Prof. Anat., Univ. of Utah
- STEWART, Gwendolyn J.: Asst. Prof. Biol., Boston Univ.

STROBER, Warren: Sr. Investigator, National Cancer Inst., NIH
 SZIDON, Jan P.: Asst. Prof. Med., Univ. of Pennsylvania
 SZUMSKI, Alfred J.: Assoc. Prof. Physiol., Med. Coll. of Virginia
 URBAN, Ernest: Assoc. Prof. Physiol. & Med., Univ. of Texas Med.
 Sch., San Antonio
 VALENTINUZZI, Max E.: Asst. Prof. Physiol., Baylor Coll. Med.
 WALTER, Roderich W.: Prof. Physiol., Mount Sinai Sch. Med., N.Y.
 WERNER, Gerhard: Prof., Chrmn., Dept. Pharmacol., Univ. Pittsburgh
 WILLIAMS, William L.: Res. Prof., Dept. Biochem., Univ. of Georgia
 WOLF, George: Assoc. Prof. Anat., Mt. Sinai Med. Sch., N.Y.
 WOOD, Jackie: Asst. Prof. Biol., Williams College
 WOODWARD, Donald J.: Asst. Prof. Physiol., Univ. of Rochester
 YEH, Billy K-J: Asst. Prof. Med., Univ. of Miami

ASSOCIATE MEMBERS

ALLEN, Gary.: Res. Assoc. Physiol., State Univ. N.Y., Buffalo
 BARTOSHUK, Linda M.: Asst. Fellow Psychol., John B. Pierce Fndn.
 BASHIR, Nasir A.: Asst. Prof. Physiol., Meharry Med. College
 BOND, Gary C.: Res. Physiologist, St. Luke's Hosp., Kansas City
 CHAPLER, Christopher K.: Asst. Prof. Physiol., Queen's University
 CHAPMAN, Lloyd W.: Grad Student Physiol., Univ. of Southern Cal.
 CLARK, Donald R.: Assoc. Prof. Vet. Physiol. & Pharmacol., Texas
 A & M Univ.
 CROOK, Philip G.: Prof. & Chrmn., Dept. Biol., Colgate Univ.
 DALLMAN, Mary F.: Lecturer, Physiol., Univ. California, S.F.
 DAVIS, Jimmie M.: Scientist, Analytical Neurochem., Galesburg
 State Res. Hosp.
 FISHMAN, Noel H.: Res. Trainee, C.V. Res. Inst., Univ. California, S.F.
 FLETCHER, C. T.: Predoct. Student Anat., Indiana Univ.
 FOX, Karl R.: Medical Fellow, Univ. of Minnesota
 GELLER, Herbert M.: Asst., Dept. Physiol., Univ. of Rochester
 HAZEL, Jeffrey R.: Grad. Student, Dept. Physiol. & Biophys., Univ.
 of Illinois
 HEDGLIN, Walter L.: Grad. Student, Dept. Human Physiol., Univ. of
 California, Davis
 HICKS, Jimmie L.: Jr. Physiologist, Colorado State Univ.
 HJLL, George Jr.: Chrmn., Dept. Biology, Fisk Univ.
 JONES, Richard L.: Res. Assoc. Med. Coll. of Wisconsin
 KACHADORIAN, William A.: Asst. Prof., Dept. Physical Ed., Univ.
 of Toledo
 KONES, Richard J.: Instr., Med., Tulane Univ. Sch. Med.
 LeFLORE, William B.: Prof. Biol., Spelman College
 McMILLAN, James A.: Predoct. Stu., Animal Physiol., Univ. Calif.
 Davis
 MICHAELSON, Edward D.: Instr., Med. & Physiol., Univ. Texas
 MYERS, James H.: Res. Collaborator Biol., Brookhaven Natl. Lab.
 NICHOLS, Buford L.: Asst. Prof. Pediat. & Instr. Physiol., Baylor
 Coll. of Med.
 OLDEN, Kenneth: Res. Fellow Physiol., Harvard Med. Sch.
 PHILLIPSON, Eliot A.: Res. Fellow, CV Res. Inst., Univ. Calif., S.F.
 ROLFE, Birdie L.: Assoc. Prof. Physiol., Meharry Med. College
 SALCMAN, Michael: Staff Assoc., Lab. of Neural Control., NIH

- STARR, Matthew C.: Grad Student, CV Res. Lab., Univ. Southern California
WAHRENBROCK, Eric A.: Asst. Prof. Med., Univ. of California, San Diego
WALL, Malcolm J. Jr.: Instr. Physiol. & Med., Med. Coll. Wisconsin
WOLTHUIS, Roger A.: Assoc. Principle Res. Sci., Technology, Inc. San Antonio, Texas

FUTURE MEETINGS

- 1972 Spring - Federation Meeting, April 9-14, Atlantic City, N.J.
1972 Summer - APS Meeting (with Comparative Physiologists), August 27-September 1, Pennsylvania State University, University Park
1973 Spring, Federation Meeting, April 15-20, Atlantic City, N.J.
1973 Summer - APS Meeting, August 27-September McGill University, Montreal, Canada
1974 Spring - Federation Meeting, April 8-12, Atlantic City, N.J.
1974 Summer - APS Meeting, State University of New York at Albany
1975 Spring - Federation Meeting, April 14-18, Atlantic City, N.J.
1975 Summer - APS Meeting, Michigan State University, East Lansing
1976 Spring - Federation Meeting, April 12-16, Atlantic City, N.J.

MEMORANDUM
on
PROGRAM PLANNING

TO: The Members of the American Physiological Society

FROM: Frans F. Jübsis, Chairman of the Program Committee

RE: Program of the Spring 1972 Meeting

First I want to thank all those members who so diligently filled out Henry Lauson's questionnaire about Symposia, Introductory Talks, Etc. in the Federation Meetings. Your response has been a tremendous help to the Program Committee. We have carefully weighed the outcome and have made several changes according to the thrust of the suggestions.

There was much approval of the Symposia and the 30 minutes Chairmen's Introductory Talks and there were many requests for more of each. Accordingly we have scheduled six symposia for this Spring (instead of the usual four) and ten Introductory Talks (instead of six). Since all available rooms in Atlantic City are always fully subscribed, this increase necessitates dropping approximately 30 contributed papers. That is the main reason for the lowered total of acceptance in the lottery to approximately 800 instead of 850.

There also were many requests for aiming the content of symposia more at physiologists not working in the specific area under discussion. We have passed this suggestion on to the Chairmen.

The many, many topics and names proposed for Introductory Talks and Discussions were very helpful indeed. This Spring's program will reflect your input and we will use your suggestions also for the planning of the 1973 Meeting.

Many thanks again. See you on the Boardwalk!

THE AMERICAN PHYSIOLOGICAL SOCIETY

Founded December 30, 1887; Incorporated June 2, 1923

OFFICERS 1971-1972

President - J. R. Brobeck, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania
President-Elect - R. M. Berne, University of Virginia School of Medicine, Charlottesville, Virginia
Past-President - A. C. Barger, Harvard University Medical School, Boston, Massachusetts
Council - J. R. Brobeck (1973), R. M. Berne (1974), A. C. Barger (1972), D. C. Tosteson (1973), Ernst Knobil (1972), E. E. Selkurt (1974), Bodil Schmidt-Nielsen (1975).
Executive Secretary-Treasurer - Ray G. Daggs, 9650 Rockville Pike, Bethesda, Maryland 20014

STANDING COMMITTEES

Publications - P. F. Curran (1972), Chairman; D. S. Fredrickson (1972), P. Horowitz (1974). Ex officio - J. R. Brobeck, Physiological Reviews; J. M. Brookhart, Journal of Neurophysiology; A. P. Fishman, Handbooks; R. G. Daggs, Executive Secretary-Treasurer, Editor of The Physiologist and Associate Editor of Physiological Reviews; Sara F. Leslie, Publications Manager and Executive Editor; S. R. Geiger, Executive Editor for Handbooks.
Finance - J. M. Brookhart (1973), Chairman; C. F. Code (1973), E. B. Brown (1974). Ex officio - R. G. Daggs, Executive Secretary-Treasurer; W. A. Sonnenberg, Business Manager.
Education - J. L. Kostyo (1973), Chairman; L. Share (1973), D. F. Bohr (1973), A. Ames III (1974), F. N. Briggs (1974); Representatives from Society of General Physiologists - B. A. Curtis (1973), P. B. Dunham (1973); Representatives from Comparative Physiology Division of the American Society of Zoologists - I. J. Deyrup-Olsen (1974), G. C. Stephens (1972), Orr E. Reynolds, Education Officer.
Membership Advisory - J. A. Herd (1973), Chairman; J. Metcalfe (1973), W. C. Bowie (1973), S. Solomon (1974), J. P. Reuben (1973).
Program Advisory - F. F. Jobsis (1972), Chairman; H. M. Goodman (1973), D. Kennedy (1973), M. F. Wilson (1973), S. Y. Botelho (1974).
Public Affairs - R. K. Crane (1973), Chairman; A. B. Otis (1973), H. D. Patton (1974), J. B. Preston (1974), T. Cooper (1974).
Senior Physiologists - D. B. Dill (1974), Chairman; H. S. Mayerson (1974), H. Davis (1972), H. E. Essex (1972).
Perkins Memorial Fund - J. R. Pappenheimer (1974), Chairman; H. Rahn (1974), J. R. Brobeck (1972), E. Knobil (1972). Ex officio - Mrs. J. F. Perkins, Jr., R. G. Daggs, Executive Secretary-Treasurer.
Porter Physiology Development Program - A. C. Barger (1974) and E. W. Hawthorne (1974), Co-Chairmen; E. P. Radford (1974), W. C. Foster (1974), H. V. Sparks (1973), W. Tong (1973), Clem Russ (1972).
Animal Care and Experimentation - H. R. Parker (1974), Chairman; E. T. Angelakos (1974), L. S. Lilienfield (1974), W. J. Tietz, Jr. (1974).
Legal Counsel - W. H. Pattison, Jr.

REPRESENTATIVES TO OTHER ORGANIZATIONS

- Federation Board - R. M. Berne (1974), J. R. Brobeck (1973), A. C. Barger (1972).
Federation Executive Committee - J. R. Brobeck (1973).
Federation Publications Committee - J. W. Severinghaus (1973).
Federation Meetings Committee - D. C. Tosteson (1974).
Federation Program Committee - R. G. Daggs
Federation Public Affairs Committee - R. K. Crane (1973).
Federation Public Information Committee - R. K. Crane (1973).
Executive Officers Advisory Committee of the Federation - R. G. Daggs
U.S. National Committee for International Union of Physiological Sciences - J. M. Brookhart (1975), A. C. Barger (1975), L. D. Carlson (1973), J. R. Brobeck (1976).
U.S. National Committee for International Union of Biological Sciences - E. Knobil (1973).
U.S. National Committee for International Union of Pure and Applied Physics - A. P. Gagge (1973).
U.S. National Committee for Engineering in Medicine and Biology - M. L. Wolbarsht (1975).
National Research Council, Div. of Biology and Agriculture - H. Gainer (1973); Div. of Medical Sciences - M. B. Burg (1973).
American Association for the Advancement of Science - W. G. Van der Kloot (1973), E. J. Masoro (1973).
National Society for Medical Research - H. R. Parker (1973).
American Society for Information Science - S. R. Geiger (1973).
Council of Academic Societies of the Association of American Medical Colleges - A. B. Otis (1974), L. D. Carlson (1974).

PUBLICATIONS

- Publications Committee - P. F. Curran (1972), Chairman; D. S. Fredrickson (1972), Paul Horowicz (1974).
Publications Manager and Executive Editor - Sara F. Leslie
American Journal of Physiology and Journal of Applied Physiology - Section Editors - D. F. Bohr, F. J. Klocke, W. C. Randall (Circulation); L. E. Farhi, S. Permutt (Respiration); W. B. Kinter, E. E. Windhager (Renal and Electrolyte); S. G. Schultz (Gastrointestinal); N. S. Halmi, F. E. Yates (Endocrinology and Metabolism); J. D. Hardy (Environmental); L. B. Kirschner (Comparative and General); J. deC. Downer (Neurobiology); O. D. Ratnoff (Hematology); F. N. Briggs (Muscle)
Journal of Neurophysiology - J. M. Brookhart, Chief Editor
Physiological Reviews - J. R. Brobeck, Chairman, Editorial Board; D. R. Wilkie, Chairman, European Committee; R. G. Daggs, Associate Editor
Handbooks of Physiology - A. P. Fishman, Chairman Editorial Committee; S. R. Geiger, Executive Editor
The Physiologist - R. G. Daggs, Editor
The Physiology Teacher - Nancy S. Milburn, Editor; O. E. Reynolds, Executive Editor
Physiology in Medicine - A. P. Fishman, Editor

PAST OFFICERS

Presidents - 1888 H. P. Bowditch. 1889-1890 S. W. Mitchell. 1891-1895 H. P. Bowditch. 1896-1904 R. H. Chittenden. 1905-1910 W. H. Howell. 1911-1913 S. J. Meltzer. 1914-1916 W. B. Cannon. 1917-1918 F. S. Lee. 1919-1920 W. P. Lombard. 1921-1922 J. J. R. MacLeod. 1923-1925 A. J. Carlson. 1926-1929 Joseph Erlanger. 1930-1932 W. J. Meek. 1933-1934 A. B. Luckhardt. 1935 C. W. Greene. 1936-1937 F. C. Mann. 1938-1939 W. E. Garrey. 1938 W. T. Porter Honorary President. 1940-1941 A. C. Ivy. 1942-1945 P. Bard. 1946-1947 W. O. Fenn. 1948 M. B. Visscher. 1949 C. J. Wiggers. 1950 H. C. Bazett (April to July); D. B. Dill. 1951 R. W. Gerard. 1952 E. M. Landis. 1953 E. F. Adolph. 1954 H. E. Essex. 1955 W. F. Hamilton. 1956 A. C. Burton. 1957 L. N. Katz. 1958 H. Davis. 1959 R. F. Pitts. 1960 J. H. Comroe, Jr. 1961 H. W. Davenport. 1962 H. S. Mayerson. 1963 H. Rahn. 1964 J. R. Pappenheimer. 1965 J. M. Brookhart. 1966 R. E. Forster. 1967 R. W. Berliner. 1968 L. D. Carlson. 1969 C. L. Prosser. 1970 A. C. Barger.

Secretaries - 1888-1892 H. N. Martin. 1893-1894 W. P. Lombard. 1895-1903 F. S. Lee. 1904 W. T. Porter. 1905-1907 L. B. Mendel. 1908-1909 Reid Hunt. 1910-1914 A. J. Carlson. 1915-1923 C. W. Greene. 1924-1929 W. J. Meek. 1930 A. C. Redfield. 1931-1932 A. B. Luckhardt. 1933-1935 F. C. Mann. 1936-1939 A. C. Ivy. 1940-1941 Philip Bard. 1942 C. J. Wiggers. 1943-1946 W. O. Fenn. 1947 M. B. Visscher.

Treasurers - 1888-1892 H. N. Martin. 1893-1894 W. P. Lombard. 1895-1903 F. S. Lee. 1904 W. T. Porter. 1905-1912 W. B. Cannon. 1913-1923 Joseph Erlanger. 1924-1926 C. K. Drinker. 1927-1936 Alexander Forbes. 1937-1940 W. O. Fenn. 1941 C. J. Wiggers. 1942-1946 Hallowell Davis. 1947 D. B. Dill.

Executive Secretary-Treasurer - 1948-1956 M. O. Lee. 1956- R. G. Daggs

CONSTITUTION AND BYLAWS

CONSTITUTION

(Adopted at the 1953 Spring Meeting)

ARTICLE I. Name

The name of this organization is THE AMERICAN PHYSIOLOGICAL SOCIETY.

ARTICLE II. Purpose

The purpose of the Society is to promote the increase of physiological knowledge and its utilization.

BYLAWS

(Amended April 1966)

ARTICLE I. Principal Office

SECTION 1. The Society shall have its principal place of business at 9650 Rockville Pike, Bethesda, Maryland 20014. The Central Office shall house all activities delegated to the employees of the Society.

ARTICLE II. Corporate Seal

SECTION 1. The corporate seal of the Society shall be a circle surrounded by the words, THE AMERICAN PHYSIOLOGICAL SOCIETY. The seal shall also show the founding date and the date and place of incorporation.

SECTION 2. The Executive Secretary-Treasurer shall have custody of the seal. It shall be used on all official documents requiring it, and shall be placed on the documents by the Executive Secretary-Treasurer upon approval by Council.

ARTICLE III. Membership

SECTION 1. The Society shall consist of regular members, honorary members, associate members, retired members and sustaining associates.

SECTION 2. Regular Members. Any person who as conducted and published meritorius original research in physiology, who is presently engaged in physiological work, and who is a resident of North America shall be eligible for proposal for regular membership in the Society.

SECTION 3. Honorary Members. Distinguished scientists of any country who have contributed to the advance of physiology shall be eligible for proposal as honorary members of the Society.

SECTION 4. Associate Members. Advanced graduate students in physiology at a predoctoral level, teachers of physiology, and investigators who have not yet had the opportunity or time to satisfy the requirements for regular membership shall be eligible for proposal for associate membership in the Society provided they are residents of North America. Associate members may later be proposed for regular membership.

SECTION 5. Retired Members. A regular or associate member who has reached the age of 65 years and/or is retired from regular employment may, upon application to Council be granted retired member status.

SECTION 6. Sustaining Associates. Individuals and organizations who have an interest in the advancement of biological investigation may be invited by the President, with approval of Council, to become sustaining associates.

SECTION 7. Nominations for Membership. Two regular members of the Society must join in proposing a person for regular membership, honorary membership or associate membership, in writing and on forms provided by the Executive Secretary-Treasurer. The Membership Committee shall investigate their qualifications and recommend nominations to Council. Council shall nominate members for election at the Spring and Fall meetings of the Society. A list of nominees shall be sent to each regular member at least one month before the Spring and Fall meetings.

SECTION 8. Election of Members. Election of regular members, honorary members and associate members shall be by secret ballot at Spring and Fall business meetings of the Society. A two-thirds majority vote of the members present and voting shall be necessary for election.

SECTION 9. Voting. Only regular members shall be voting members. Honorary, retired and associate members shall have the privilege of attending business meetings of the Society but shall have no vote.

ARTICLE IV. Officers

SECTION 1. Council. The management of the Society shall be vested in a Council consisting of the President, the President-Elect, the immediate Past-President, and four other regular members. The terms of the President and of President-Elect shall be one year. The terms of the four additional Councilors shall be four years each and they shall not be eligible for immediate reelection except those who have served for two years or less in filling interim vacancies.

A quorum for conducting official business of the Society shall be five of the seven elected members of Council.

The Chairman of the Publications Committee; the Chairman of the Finance Committee; and the Executive Secretary-Treasurer are ex-officio members of the Council without vote. The Council may fill any interim vacancies in its membership. Council shall appoint members to all committees.

SECTION 2. President. A person shall serve only one term as President, except that if the President-Elect becomes President after September 30 he shall continue as President for the year beginning the next July 1. The President shall chair all sessions of the Council and business meetings of the Society and shall be an ex officio member of all committees without vote.

SECTION 3. President-Elect. The President-Elect shall serve as Vice-President of the Society and as official secretary of the Council. Should he have to function as President prematurely, the Council shall select from among its own members an official secretary.

SECTION 4. Election of Officers. Nominations and election of a President-Elect and Councilor(s) shall be by secret ballot at the Spring business meeting of the Society. They shall assume office on July 1 following their election.

SECTION 5. Executive Secretary-Treasurer. The Council shall be empowered to appoint and compensate an Executive Secretary-Treasurer who shall assist it in carrying on the functions of the Society including the receipt and disbursement of funds under the direction of the Council. He shall be responsible for management of the Central Office of the Society under general supervision of the Council.

ARTICLE V. Standing Committees

SECTION 1. Publications Committee. A Publications Committee composed of three regular members of the Society appointed by Council shall be responsible for the management of all of the publications of the Society. The term of each member of the Publications Committee shall be three years; a member may not serve more than two consecutive terms. The Council shall designate the Chairman of the Committee who shall be an ex officio member of the Council, without vote. Council is empowered to appoint and compensate a Publications Manager who shall assist in carrying out the functions of the Publications Committee under the supervision of the Executive Secretary-Treasurer. The President, Executive Secretary-Treasurer and the Publications Manager shall be ex officio members of the Publications Committee without vote. The

Committee shall have the power to appoint editorial boards for the Society's publications. The Committee shall present an annual report on publications and policies to the Council for approval and present an annual budget coordinated through the Executive Secretary-Treasurer, to the Finance Committee for its approval and recommendation to Council.

SECTION 2. Finance Committee. A Finance Committee, composed of three regular members of the Society appointed by Council, shall receive the total coordinated budget proposals annually from the Executive Secretary-Treasurer and shall determine the annual budgets, reserve funds and investments of the Society, subject to approval by the Council. The term of each member of the Finance Committee shall be three years, a member may not serve more than two consecutive terms. The Council shall designate the Chairman of the Committee who shall be an ex officio member of the Council, without vote. Council is empowered to appoint and compensate a Business Manager who shall assist in carrying out the functions of the Finance Committee under the supervision of the Executive Secretary-Treasurer. The President-Elect, Executive Secretary-Treasurer and the Business Manager shall be ex officio members of the Finance Committee, without vote.

SECTION 3. Membership Committee. A Membership Committee, composed of six or more regular members of the Society appointed by the Council, shall receive and review processed applications for membership and make recommendations for nomination to the Council. The term of each member of the Membership Committee shall be three years; a member shall not be eligible for immediate reappointment. The Chairman of the Committee shall be designated by the Council.

SECTION 4. Education Committee. An Education Committee, composed of five or more regular members of the Society and representatives of such other societies as may be designated by the Council appointed by the Council, shall conduct such educational, teaching and recruitment programs as may be required or deemed advisable. The term of each member of the Education Committee shall be three years. The Chairman of the Committee shall be designated by the Council. The Executive Secretary-Treasurer may act as Executive Director of the educational programs with approval of the Council. The Committee shall present an annual report to the Council and an annual budget through the Executive Secretary-Treasurer to the Finance Committee for its approval.

SECTION 5. The Council may appoint such special and other standing committees as it deems necessary or that are voted by the Society. The Council may name regular members of the Society as representatives to other organizations whenever it deems such action desirable.

ARTICLE VI. Dues

SECTION 1. Annual Dues. The annual dues for regular members and associate members shall be determined by the Council and shall be paid in advance of July 1. Honorary members and retired members shall pay no membership dues.

SECTION 2. Non-payment of dues. A regular or associate member whose dues are two years in arrears shall cease to be a member of the Society, unless after payment of his dues in arrears and application to the Council, he shall be reinstated at the next meeting by vote of the Council. It shall be the duty of the President-Elect to notify the delin-

quent of his right to request reinstatement.

SECTION 3. Retirement. A regular or associate member who has been granted retired membership status is relieved from the payment of dues but retains the other privileges of his former membership status, except voting privileges.

ARTICLE VII. Financial

SECTION 1. Society Operating Fund. The Society Operating Fund shall consist of all funds, other than Publication Operating Funds and Publication Contingency and Reserve Funds, restricted or unrestricted, uninvested or invested, short or long term. The Executive Secretary-Treasurer shall be the responsible agent to the Council with signatory powers. Signatory powers may be delegated to the Business Manager by the Executive Secretary-Treasurer.

SECTION 2. Publications Operating Fund. The Publications Operating Fund shall consist of all funds that involve receipts, expenses, short-term investments relating to the annual receipts, disbursements and continuing operation of the Society's publications. The Executive Secretary-Treasurer shall be the responsible agent to the Council with signatory powers. Signatory powers may be delegated to the Publication Manager and/or the Business Manager by the Executive Secretary-Treasurer.

SECTION 3. Publications Contingency and Reserve Fund. The Publications Contingency and Reserve Fund shall consist of the long-term capital investments of publication earnings. The Executive Secretary-Treasurer, with advice from the Finance Committee, shall have discretionary and signatory powers, except for withdrawals. Authority for any withdrawal from this fund, shall require the following five signatures: 1) the Chairman of the Publications Committee (alternate, the senior member of the Committee); 2) the President of the Society (alternate, the President-Elect); 3) the Executive Secretary-Treasurer (alternate, the Publications Manager); 4) and 5) any two members of Council. The Finance Committee shall not recommend to Council the expenditure of any of this capital fund for non-publication purposes without the consent of the Publications Committee. The Finance Committee shall be responsible for the separate investment of the reserve fund for publications; any capital gains from such investment shall accrue to the fund (capital losses will, however, reduce its value). Any dividends, interest or income, other than capital gains, from this invested fund may be used for emergency support of any of the activities of the Society, including publications, as determined annually by the Council but the primary goal shall be to increase the investment capital.

SECTION 4. Fiscal Year. The official fiscal year shall be from January 1 through December 31.

SECTION 5. Audit. All statements of net assets and related statements of income, expenditures and fund capital shall be audited annually by an independent auditing firm.

SECTION 6. Bonding. All persons having signatory powers for the funds of the Society shall be bonded.

ARTICLE VIII. Publications

SECTION 1. The official organs of the Society shall be the American Journal of Physiology, the Journal of Applied Physiology, Physiological Reviews, the Journal of Neurophysiology, The Physiologist, and such other publications as the Society may own. All publications shall be under the jurisdiction and management of the Publications Committee unless otherwise designated by the Council. The names of the journals and publications may be changed by the Council on recommendation from the Publications Committee and any publication may be dropped by Council on recommendation from the Publications Committee.

ARTICLE IX. Meetings

SECTION 1. Spring Meeting. A meeting of the Society for transacting business, electing officers and members, presenting communications, and related activities, shall ordinarily be held in the Spring of each year.

SECTION 2. Fall Meeting. A Fall meeting of the Society shall be held at a time and place determined by the Council for presenting communications, electing members, and for transacting business except for the election of officers and adoption of amendments to the Bylaws. Under exceptional circumstances Council may cancel such a meeting.

SECTION 3. Special Meetings. Special meetings of the Society or of the Council may be held at such times and places as the Council may determine.

SECTION 4. Quorum. At all business meetings of the Society fifty regular members shall constitute a quorum.

SECTION 5. Parliamentary Authority. The rules contained in Roberts Rules of Order, Revised shall govern the conduct of the business meetings of the Society in all cases to which they are applicable and in which they are not inconsistent with the Bylaws or special rules of order of the Society.

ARTICLE X. Society Affiliations

SECTION 1. The Society shall maintain membership in such organizations as determined by Council.

ARTICLE XI. Regulations

SECTION 1. General Prohibitions. Notwithstanding any provision of the Constitution or Bylaws which might be susceptible to contrary interpretation:

- a. The Society is organized and operated exclusively for scientific and educational purposes.
- b. No part of the net earnings of the Society shall or may under any circumstances inure to the benefit of any member or individuals.
- c. No substantial part of the activities of the Society shall consist of carrying on propaganda, or otherwise attempt to influence local, state or national legislation. (All activities of the Society shall be determined by Council). The Society shall not participate in, or intervene in (including the

publishing or distributing of statements) any campaign on behalf of any candidate for public office.

- d. The Society shall not be organized or operated for profit.

SECTION 2. Distribution on Dissolution. Upon lawful dissolution of the Society and after payment of all just debts and obligations of the Society, Council shall distribute all remaining assets of the Society to one or more organizations selected by the Council which have been approved by the United States Internal Revenue Service as organizations formed and dedicated to exempt purposes.

ARTICLE XII. General

SECTION 1. Records. All official records, archives and historical material shall be held in the Central Office in the custody of the Executive Secretary-Treasurer.

SECTION 2. Procedures and Customs. The Society shall maintain a current Operational Guide detailing the procedures and current customs of the Society operations as well as the duties and responsibilities of officers, committees, and major employees. The Operational Guide shall be maintained current by the Executive Secretary-Treasurer as determined by the Council.

ARTICLE XIII. Amendments

SECTION 1. Presentation. Amendments to these Bylaws may be proposed in writing, by any regular member, to Council at any time up to three months in advance of the Spring meeting, or at a business meeting of the Society. Such proposed amendments must be presented in writing at the following Spring business meeting for action by the Society.

SECTION 2. Adoption. These Bylaws may be amended at any Spring business meeting of the Society by a two-thirds majority vote of the regular members present and voting.

IV INTERNATIONAL BIOPHYSICS CONGRESS

The IV International Biophysics Congress will be held August 7-14, 1972 at the Moscow State University, Moscow, U.S.S.R. under the sponsorship of the International Union of Pure and Applied Biophysics and the Academy of Sciences of the U.S.S.R. The Congress will include symposia of invited papers on topics of particular interest at the moment, and sessions for contributed papers. English, French, German and Russian will be the official languages of the Congress. Simultaneous translation will be available in English and Russian for the symposia only. The scientific sessions will be held at the University.

Participants in the Congress may make travel arrangements with any tourist agency which is a contractor of the Soviet travel agency, "Intourist".

Inquiries regarding the Congress may be sent to:

Professor L. P. Kayushin
Secretary-General, Organizing Committee
IV International Biophysics Congress
Profsoyuznaya 7
Moscow, V-133
U.S.S.R.

Or

Harvey E. Sheppard
Division of Biology and Agriculture
National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

PAST-PRESIDENT'S ADDRESS

To Assist Young Men and Women in the Study of Physiology:
The Porter Development Program

A. CLIFFORD BARGER

How fitting it is to hold the Fall meeting of the American Physiological Society this year here in Lawrence, Kansas, only a few hundred miles away from the birthplace of Walter Bradford Cannon, the centennial of whose birth we shall soon celebrate, and about him I wish to speak this evening. And the midwest was also the birthplace of William Townsend Porter, another physiologist of whom I wish to speak, and who may not be remembered by you. Porter was Cannon's colleague in the Department of Physiology at Harvard Medical School and their careers were poignantly interwoven. Both, in somewhat different fashions, did so much to encourage young men and women of promise in the study of physiology. It is a particular pleasure for me to talk of Cannon and of Porter for I feel a certain kinship to both of them. Cannon was a teacher of mine, and in turn, it was my good fortune to teach two of Dr. Cannon's grandsons. We also have a geographical kinship, for both Cannon's paternal and maternal ancestors came from western Massachusetts within a few miles of my own hometown. My kinship with Dr. Porter stems from my long association with the Harvard Apparatus Company, the organization founded by Porter.

Dr. Cannon was born on October 19, 1871, nearly a hundred years ago, at Prairie du Chien, a small town on the upper Mississippi River in Wisconsin. It would appear that Cannon's studies on gastrointestinal physiology were preordained, for the town of Prairie du Chien contained the site of old Fort Crawford, where, in the 1820's, William Beaumont made his classic observations on gastric function in his patient with a permanent gastric fistula, the now famous Alexis St. Martin. Cannon, who succeeded Henry Pickering Bowditch as the Higginson Professor at the Harvard Medical School, first achieved fame with his pioneering studies on gastrointestinal movement studied by the Röntgen ray. These observations, made by a first year medical student, only a year after the discovery of X-rays, were the foundation of gastrointestinal radiology. In these researches on digestion, the importance of emotional factors soon became apparent, stimulating an interest in the effect of strong emotions on bodily function and disease states. These studies laid the scientific basis for a second area of medicine, that of psychosomatic illness. These investigations, quite naturally, led to the study of the sympathetic nervous system, to the discovery with Uridil in 1921 of the release into the blood of the sympathetic transmitter, to the development of the concept of Sympathin E and I with Rosenblueth, and the elaboration of the concept of homeostasis. Few have made so many important contributions to physiology and to medicine as the man whose 100th birthday we shall celebrate in two months. In addition, Cannon served as treasurer of the American Physiological Society from 1905 to 1912 and was President from 1914 through 1917.

But it is more of Cannon as a citizen and as a preceptor that I wish

to speak. Cannon believed strongly that "the scientist is also a citizen and may feel a compulsion to engage in services which he as a citizen has opportunities to perform. And if freedom, essential for productive scholarship, is threatened, the call to engage in defense of it may be imperative." He was the first Chairman of the Committee for the Protection of Medical Research formed by the American Medical Association in 1908, and served on this Committee for 17 years. Throughout this period he labored incessantly to broaden the understanding of the importance of the experimental method for the advancement of medical knowledge. He worked untiringly, on the one hand to improve the conditions in the research laboratories, and on the other hand to combat the antivivisectionists. And although the battle was serious, Cannon did not lose his sense of humor. As Dean David Edsall reported: "Some years ago he repeatedly invited some ladies who were ardent antivivisectionists to visit his laboratory in order that they might see that humane methods control all its work. Finally they somewhat fearfully came, and while in conversation in his office one of them noticed a family photograph on his desk. Evidently astonished that there could be a tender side to a horrid experimenter she exclaimed, 'Are those your children?' Dr. Cannon replied, 'Yes, even lions make good family men' " (1).

Cannon, like Donne, believed "no man is an island, entire of itself; every man is a piece of a continent, a part of the main." He was fond of saying that he was a grandson of Ludwig in scientific inheritance, and a son of Bowditch, and the father of a scattered brood in Belgium, Holland, Spain, Argentine, China, Brazil, Mexico, as well as in the various universities of the United States. He wrote "it is a great satisfaction - one of the greatest satisfactions in the career of an investigator - to realize that he is a member of the large and growing family, for some of my sons now have sons themselves and I am, therefore, a proud grandfather" (2). It was his belief in the international brotherhood of man and the universality of science that took him to the Peking Union Medical College, and to his involvement in the American Bureau for Medical Aid to China and the United China Relief, to the formation of the Medical Bureau to Aid Spanish Democracy, and to the organization of the American-Soviet Society. In his book, "The Way of an Investigator" he concluded the chapter entitled "Being a Citizen" with the following remarks:

"All these considerations have a direct bearing on the role of the scientific investigator as a citizen. The unchecked pursuit of his most cherished desires depends immediately on the liberty which a democratic government most reliably provides. He does well, therefore, to watch over it and, if necessary, to go forth from his 'serene attachment to the processes of inquiry and understanding' to battle for its security.

I am grateful that fortunate conditions gave me opportunities to test democratic methods by opposing the efforts of antivivisectionists at destroying freedom of medical investigation; to attempt aiding republican forces in Spain and in China as a struggle against oppressors; and to promote deeper sympathy and understanding between Americans and the Russians as they look forward to a better world" (3). Cannon's classroom was the world, and hundreds of young men and women emulated him in the pursuit of science, and in the pursuit of freedom.

William Townsend Porter was born in Plymouth, Ohio on September 24, 1862, and was thus Cannon's senior by 9 years. He received his medical degree in 1885 from St. Louis Medical College, now Washington University School of Medicine, and then went abroad for postgraduate studies at the Universities of Kiel, Breslau, and Berlin, under the tutelage of Flemming, Heidenhain and Hürthle. During this educational experience abroad the striking contrast between the didactic teaching of physiology at St. Louis and the experimental laboratory instruction in Germany was instrumental in shaping his future concepts of medical education.

In 1888 Porter was appointed Professor of Physiology at his alma mater, where he established the first laboratory of physiology west of Dedham. He was also Head Surgeon at St. Louis Hospital. His publications on ventricular pressures and filling, control of respiration, coronary circulation, origin of the heart beat etc. appearing in British, German, and American journals drew the attention of such well known figures as Sherrington, Starling and of Bowditch. In 1893 Bowditch, whose courtly manner and powers of persuasion helped shape the course of American physiology, convinced Porter to come to Harvard Medical School as an Assistant Professor of Physiology. (No wonder President Eliot made Bowditch Dean of the Medical School.) Porter's task was to re-organize the teaching of physiology, and in particular, to introduce routine student laboratory experiments.

Bowditch was President of the American Physiological Society at the time Porter arrived in Boston, and Porter, with prescient vision, emphasized to him the stimulus to physiology that an American journal devoted solely to this field would provide. As Landis has written (4), Porter played a key role in the founding of the American Journal of Physiology: "During his first years at Harvard, while sending to journals of physiology abroad results of his numerous studies on respiration and circulation, he repeatedly stressed, verbally and in writing, the urgent need for developing in this country a suitable medium for publishing results of physiological research. When the young American Physiological Society debated from 1894 to 1898 the feasibility of establishing its own journal, it was W. T. Porter who solved the problem by volunteering to undertake not only the managing editorship, but also full financial responsibility. To his activities as an investigator and teacher he added those of a zealous editor and astute business manager. A need for the journal can best be estimated by examining the contents of the first volume, which was published in 1898 and included papers by Porter, Howell, Lusk, Mendel, Cushny, Chittenden and A. N. Richards, together with Walter B. Cannon's paper on the use of X-rays to study gastric motility." For many years Porter personally carried the debt of the new journal, but in 1914 he was able to turn over to the Society a journal finally in the black. The founding of the journal was only one of the important educational innovations fostered by Porter.

Porter was convinced from his German postgraduate experience that medical students must have first hand laboratory knowledge of their subject if the standards of scientific education were to be raised, otherwise "much of the student's learning is mock physiology based on mock anatomy",

for "nature can not be studied apart from nature" (8). In the early 1890's the medical students at Harvard were subjected to 4 hours of continuous lecturing 5 afternoons a week, from 2 to 6 o'clock. The boredom was broken only by occasional demonstrations, the details of which few students could see, and by an inordinate number of examinations. Porter emphasized in 1898, in words that bear repeating today, that "the force now making for reform is irresistible. It is nothing less than the conviction that the mass of knowledge in every department of medicine has grown so huge as to overwhelm both professor and student. The only refuge lies in the thorough mastery of the scientific method. The medical student must acquire power rather than information. Only thus will he be able to hold a steady course through the baffling winds and crosscurrents of the veritable sea of knowledge" (8).

Unfortunately, it was a gracious Harvard custom to allow each appointee to a chair in science to furnish his own laboratory apparatus. Bowditch had brought back from Germany enough physiological equipment, at his own expense, to furnish two laboratories. However, he generously opened the doors to all members of the Faculty interested in the advancement of scientific medicine, thus starting the first laboratory of experimental medicine in the United States. But this left space for only an occasional student, on an elective basis, to perform experiments there.

This was the situation when Porter arrived in Boston in 1893. "All the first-year subjects were then taught side by side. The dissecting room and the chemical laboratory were first class. Physiology was almost exclusively talk and text-book. Almost all the students put off any real work in physiology until the 6th week before the final examination (at the end of the year). Then the students bought the stenographic notes of Dr. Bowditch's admirable lectures, and crammed for the examination - and almost all of them passed.

"It was easy to say that physiology should be taught by experiments performed by the students themselves. Harvard Medical School in 1899 had over 200 students in physiology. Working in pairs they would use over 100 kymographs. These were, at that date, made one at the time, chiefly in Leipzig. They cost \$200 each, delivered in America, and there was a delay of 5 or 6 months. Obviously the richest university could not equip 200 students at such prices.

"This Gordian knot was cut by inventing new apparatus, and by simplifying older models, so all the essential apparatus could be made by quantity production, then a new idea. The student was to learn physiology by his own laboratory observations during 4 continuous months. The talk and the text-book were to follow his observation of the living tissue.

"This plan was a double success. 1) It gave the Harvard medical student real physiology. 2) Quantity production left surplus apparatus to be used by other schools.

"An effort was made to have the apparatus manufactured by a commercial firm. That effort failed. So, in its first years, the apparatus

was made by 'The Mechanics of the Harvard Physiological Laboratory.' But that could not be allowed on non-taxed property. Hence, the Harvard Apparatus Company was formed. The original capital was raised by President Eliot. The contributors were Francis Blake, celebrated telephone inventor; Augustus Hemenway, a Boston philanthropist; and three eminent professors of the Harvard Medical School."

With such an auspicious start, why was Porter so soon forgotten? In the early 1900's Porter essentially ran the Department of Physiology at Harvard Medical School as Bowditch turned over more and more of the duties to him as Bowditch approached retirement. The instruction in the department was Porter's responsibility, and he planned "a more extended course than medical students have ever been given" (9). To help him organize the new teaching program, Porter recommended Cannon's promotion to Instructor in a letter to President Eliot. "Cannon has worked in this laboratory and is familiar with the new plans. He has published investigations of value. He is a strong, well-balanced man, older than his years, and certain to be a credit to the University. Dr. Bowditch some time ago promised Cannon he should be recommended for an instructor's place, with \$1200 salary" (9).

Two years later Porter again wrote in Cannon's behalf to President Eliot (10). "Your interest in attaching clever young men to the University has been so often shown that I feel you will welcome brief mention of Dr. Cannon's present position. Dr. Cannon's unusual ability is already known to you. He is an independent investigator, an excellent administrator, and a man of tact, now well advanced in a career of distinction Dr. Cannon this year does the work usually done by an Assistant Professor

"Dr. Cannon has not of course asked me to write you nor complained in any way. He is devoted to Harvard. I write because the demand for physiologists outruns the supply. Men inferior to Dr. Cannon are offered much larger salaries. Should Dr. Cannon leave us, his place could not be filled at present."

Ten months later, in 1902, Porter again pressed Eliot: "This is the third year in which Dr. Cannon has done a professor's work. His training and experience would secure him an assistant professorship in any other university. There is no better man for the place" (11). Porter's fears of losing Cannon were well founded. Early in 1903 he sent another letter to Eliot: "Dr. Cannon has been asked to be Professor of Physiology in the Medical Department of the Western Reserve University. His loss would for the present be irreparable. There is no young physiologist of his capacity in the country and even if there were he could not readily be trained to do Dr. Cannon's work in this school. Dr. Cannon now receives two thousand dollars. Should he decline the Western Reserve offer and others reasonably certain to be made him I hope that his salary may be increased beginning next September" (12).

While Porter was pleading for Cannon, his own position began to deteriorate. The 1960's was not the first era of student unrest at Harvard. In 1904 a group of students sought an audience with the Dean of

the Medical School to protest the large number of failures in physiology. Porter, on his arrival at Harvard in 1893, had complained that almost all students were passed, with too little regard for standards of excellence; now the students were complaining that a third of the class was flunking. Perhaps, in his missionary zeal, Porter had pressed too fast to raise the standards of scientific education, for Harvard, unlike Hopkins, still did not require a college degree for admission, and 38% of those without college degrees had failed to pass physiology in the years 1902 to 1904. On the other hand, the students were outspoken in their praise of Cannon as a teacher, and President Eliot had come to rely heavily on Cannon's advice in university matters. Thus, when Cannon received a call from Cornell in 1906, Eliot decided to resolve the dilemma in the following manner:

1. Cannon would succeed Bowditch as Higginson Professor and Chairman of the Department.

2. Porter would become Professor of Comparative Physiology.

Relations between Cannon and Porter were strained for years thereafter. Cannon used the front stairs; Porter walked down the rear ones. Little was heard of Porter. However, as the American Physiological Society approached its 50th anniversary in 1937, there appeared to be "an awakening consciousness of the unassuming but inspiring role of William Townsend Porter in the annals of American physiology. It was an agreeable and appealing surprise, therefore, when President Mann, acting with the approval of Council, nominated Doctor Porter Honorary President of the Society for the semi-centennial celebration. This nomination was supported by Dr. A. J. Carlson, Dr. W. B. Cannon, Dr. Chas. W. Greene, and others, and was carried" (5).

At the anniversary celebration in Baltimore in 1938, President Walter E. Garrey introduced the Honorary President and Toastmaster, Dr. Porter, with warm words of praise. The ovation which ensued deeply touched Dr. Porter who responded: "Your generous applause moves almost to tears this aged man and poor. It is the more welcome because for many years I have not enjoyed the pleasure and the great benefit of these meetings. My relation to the Society has been that of a flying buttress - I have helped from the outside in my small way.

"I am pleased, too, because you escape the error of all my earlier life. I used to put the head above the heart. You are more wise. You applaud, not the intellect, but the wish to be of service" (6).

In 1929, after his retirement from Harvard, Porter offered the Harvard Apparatus Company as a gift to the American Physiological Society. On December 28, 1929 the Council of the Society resolved: "It is the opinion of the Council of the American Physiological Society that it would not be practicable for the said Society to undertake or to supervise the management of the Harvard Apparatus Company. At the same time the Council wishes to place itself on record in believing that there is no one agency, during recent years, which has contributed more to the development of sound teaching in experimental physiology in this country than

the Harvard Apparatus Company."

In 1934 the Harvard Apparatus Company became a non-profit organization dedicated 1) to develop and manufacture equipment needed in education and research in physiology and 2) to encourage and assist young men and women of promise in their study of physiology. Since 1921 Porter had contributed the profits from the company for the annual award by the American Physiological Society of the Porter Research Fellowship, a grant to a young postdoctoral physiologist of promise. Some 40 distinguished physiologists, both male and female, have been recipients of the award. After World War II, as the postdoctoral research fellowship program of the government expanded, the number of applicants for the Porter Fellowship dwindled and it was decided to award the fellowship to an outstanding predoctoral candidate in the last year of study. Unfortunately, no black had been a Porter Fellow in the first 44 years of the award.

In 1965, following discussions with Drs. Edward P. Radford and Edward W. Hawthorne, I approached Dr. John M. Brookhart, then President of the Society, with a proposal that the funds from the Harvard Apparatus Company be used to attract more blacks into physiology. With the enthusiastic support of Dr. Brookhart and of Council, Dr. Hawthorne and I approached Mr. Harold Sossen, Vice President of the Harvard Apparatus Company, with the proposed plan. He urged us to prepare a formal application for the Directors of the Company. The proposal was promptly and enthusiastically approved. The Harvard Apparatus Company agreed to increase its yearly grant to the Society in order to encourage and assist young men and women of promise in the study of physiology, and that it was understood that for the immediate term the money would be used to increase the number of black physiologists. The agreement was much broader than the previous program. Not only were funds provided for predoctoral fellowships, but some money was also made available for postdoctoral fellowships for physiologists teaching in predominantly black schools, or planning to teach there, who might wish to obtain additional experience in research and teaching. Since a department of physiology in a predominantly black school with a strong, modern laboratory program would be more likely to attract students to the field of physiology, the Harvard Apparatus Company also agreed to make grants of their laboratory equipment to selected schools. Finally, funds were provided for Visiting Porter Professors to teach at predominantly black schools for periods of days to months. Were Dr. Porter alive I am sure he would have warmly approved the arrangements made between the Company and the Society.

In 1934, at the time the Harvard Apparatus Company became a non-profit organization, the Society elected its first black member, Dr. Joseph L. Johnson. Dr. Johnson did his doctorate under Anton Carlson and then became Head of the Department of Physiology at Howard and Dean of the Medical School; the second black member was also from Howard, Dr. Walter M. Booker. The third black member, elected in 1950, was Dr. Daniel Rolfe, Chairman of the Department of Physiology at Meharry Medical College, and also Dean of that School. Thus, in 16 years 3 blacks had been elected to membership in the American Physiological Society. At the time Council began deliberations concerning the

Porter Development Program, the Society had 8 regular or associate black members. Today, of a total membership of nearly 4,000 we have only 20 blacks; we still have a long way to go. But the original Porter Development Committee appointed by Dr. Robert E. Forster in 1966 - Drs. Hawthorne, Bard, Radford, Otis and Opdyke - tilled the soil well, and thanks to the devoted help of members of the Society too numerous to name at this time, we can now begin to see the first fruits of their efforts. Dr. Joseph Hinds, the first Predoctoral Porter Fellow, recently received the joint M.D. - Ph.D. degree at Howard and has joined the Physiology Department there as Assistant Professor. Dr. Kenneth Olden, a Postdoctoral Porter Fellow, has persuaded a small group of eminently qualified black biologists to return to a predominantly black school in the South to build a modern Department of Biology there with strong emphasis on physiology.

The Porter Development Committee has encouraged local or regional collaborative efforts between predominantly black and white schools, and has supplied financial leverage. Dr. Walter C. Bowie has revamped the physiology program at Tuskegee, with assistance from members of the Department of Physiology at the University of Alabama at Birmingham, and of Porter Visiting Professors from other schools. He has begun a joint research program with Howard which is attracting a number of very able students to the field of physiology. Dr. Clem Russ has strengthened the department at Meharry and is laying the groundwork for a graduate consortium which will include Meharry, Fisk, Tennessee State and Vanderbilt University. As part of the Porter Development Program, Howard has developed stronger liaison with physiologists at the National Institute of Health, and has increased the number of graduate students in the department. Emory and the Atlanta Complex have a vigorous experiment under way which may serve as a prototype for many cities in the South. A mammalian physiology course in the Biology Department at Spelman was available for students from all the other colleges in the Atlanta Complex - Morehouse, Morris Brown, Clark and Atlanta University - but few took the course. Dr. William LeFlore approached the Porter Development Committee for assistance. The administration at Spelman agreed to refurbish the laboratory if the Committee would provide modern laboratory equipment. Drs. Alexander M. McPhedran and Elbert P. Tuttle, Jr., former students of mine now at Emory, and Eleanor Ison-Franklin of Howard (an alumna of Spelman), cooperated with Dr. LeFlore to develop a new physiology program at Spelman. In the first year 6 students took the course; the number doubled the following year, and in the third year 20 students were enrolled, and highly enthusiastic. In the past year Dr. Jack Kostyo and the members of his department at Emory participated with Dr. LeFlore to expand the course. The program was so well received that the number of students enrolled in the course may well have to be limited. Although none of the students who have taken the honors course at Spelman have, as yet, gone on to graduate work in physiology, two are now in medical school at Meharry, two at University of Buffalo, one at the University of Chicago and three in the current first year class at the Harvard Medical School. (I hasten to add that I did not proselytize for Harvard.)

With the limited funds available to it, the Porter Development Committee will continue to expand slowly into other predominantly black schools. Fortunately, recruitment for blacks at the predominantly white schools has increased markedly, and greater numbers are being educated across the country. For the first time our own department has two black graduate students. However, despite the increasing numbers in the predominantly white schools, it is well to remember, as the Carnegie Commission on Higher Education has stressed in its book "From Isolation to Main Stream," "the colleges founded for negroes are both a source of pride to blacks who have attended them and a source of hope to black families who want the benefits of higher learning for their children. They have exercised leadership in developing educational opportunities for young blacks at all levels of instruction, and especially in the South, and they are still regarded as key institutions for enhancing the general quality of the lives of black Americans" (4). Dr. Morris B. Abram, when he assumed the Chairmanship of the United Negro Fund, was asked whether the educational institution which continues to enroll primarily black persons is today a part of the rejected past, an anachronism. His reply sets this problem in perspective. He stated that he was assuming the chairmanship of the fund effort confident that the review of the civil rights movement showed that the sparks to essential reform might have taken many years to materialize had it not been for the developing pride of black men in their heritage and accomplishments. He noted that the graduates of the member colleges included nearly 85% of the nation's black physicians, three-quarters of the country's black Ph.D.'s and more than half of the black elected officials in the United States. And now, thanks to the legacy of Dr. Porter, these schools will encourage and assist more young men and women of promise in the study of physiology.

REFERENCES

1. Cannon, W. B. Exercise Celebrating Twenty-Five Years as George Higginson Professor of Physiology: October 15, 1931. Cambridge, Harvard University Press, 1932, p.9.
2. Ibid. p. 64.
3. Cannon, W. B. The Way of an Investigator. New York, Norton, 1945.
4. Carnegie Commission on Higher Education. From Isolation to Main-Stream. New York, McGraw-Hill, 1971, p.11.
5. Howell, W. H. and C. W. Greene. History of the American Physiological Society Semicentennial (1887-1937). Baltimore, Md., 1938, pp. 170-171.
6. Ibid. p. 193.
7. Landis, E. M. William Townsend Porter: 1862-1949. Am. J. Physiol. 158: V-VII, 1949.
8. Porter, W. T. The teaching of physiology in medical schools. Boston Med. Surg. J. 139: 647-652, 1898.
9. Porter, W. J. Letter to President Charles W. Eliot, April 1, 1900.
10. Porter, W. T. Letter to President Charles W. Eliot, January 23, 1902.
11. Porter, W. T. Letter to President Charles W. Eliot, November 12, 1902.
12. Porter, W. T. Letter to President Charles W. Eliot, March 13, 1903.
13. Porter, W. T. Letter to American Physiologists, December 15, 1942.

DEDICATION OF THE RAYMOND J. HOCK ROOM AT THE LABORATORY OF ENVIRONMENTAL PATHO-PHYSIOLOGY

On June 28, 1971 a symposium was held to honor Dr. Hock and to dedicate a room in his name at the Laboratory which is at the Desert Research Institute, University of Nevada at Las Vegas. This room will serve as a library and seminar room. The room will be used by the active group of researchers gathered at the laboratory of Dr. Dill. There are four main areas of work at the laboratory: - comparative animal physiology, high altitude physiology, hot weather physiology, and the effects of exercise under these extreme conditions. It is highly suitable that the focal point of the laboratory in the future will be this new seminar room, dedicated to one of this country's earliest environmental physiologists. Dr. Hock met his untimely death when on August 27, 1970, during a severe storm, he was struck by a falling tree at the bottom of Grand Canyon while on a field trip.

SIR JOSEPH BARCROFT CENTENARY SYMPOSIUM ON FETAL AND NEONATAL PHYSIOLOGY

Cambridge, July 24-29, 1972

A Symposium will be held by the Physiological Society in Cambridge on 24-29 July 1972 to commemorate the centenary of the birth of Sir Joseph Barcroft. The program will contain communications from invited speakers together with free communications. Sessions will include discussion periods covering Endocrinology, Metabolism, Respiration, Circulation, Placenta, the Nervous System and Parturition. Participation will be limited to 250 active members of the Symposium.

Further information may be obtained from Dr. P. W. Nathanielsz, The Sir Joseph Barcroft Centenary Symposium, Physiological Laboratory, Cambridge, England. Requests for information should be accompanied by an indication of any intent to present a free communication reporting novel work, together with a provisional title.

INNOVATIVE EDUCATIONAL TECHNIQUES IN PHYSIOLOGY TEACHING

ORR E. REYNOLDS

The response to the questionnaire on "Innovations in Physiological Education," incorporated in the mailing of the May issue*of this publication, was very gratifying. Although the absolute number of responses was not large (184), the sampling of attitudes and the concrete information obtained is extremely useful to the Education Program. It was especially encouraging that a high proportion (80%) of respondents expressed a willingness to be queried in more detail and to serve as consultants or reviewers of educational materials for the Society.

The following tabulations summarize the responses to the questions posed in the questionnaire, on the nature of new educational techniques under study or development (Table I) and use of special audio-visual materials (Table II). In addition to the numerical data, several other items of interest emerged.

TABLE I. Use of New Educational Techniques

	No.	Approx. %
Using new educational techniques	133	100
Audio-tutorial	54	41
Programmed instruction	32	24
Computer assisted instruction	24	18
Other techniques, including	54	41
Small group conference	12	9
Integrated Core Curriculum	8	6
Modular self-instruction	8	6

TABLE II. Use of Audio-Visual Materials

	No.	Approx. %
Using audio-visual materials	135	100
Using motion pictures	86	64
Using video tapes	82	61
Using slide-audio tapes	51	38
Using other A-V materials, including	27	20
Closed circuit TV	10	8
Multi-parameter data presentation	9	7
Slides & overhead transparencies	7	5
Using externally produced A-V materials only	10	8
Using internally produced A-V materials only	63	47
Using both internal & external materials	62	46

*Vol. 14: No. 2, May 1971

For example, of the 125 respondents generating audio-visual materials within their own institutions, 105 (84%) would be willing to share these with others, under appropriate conditions. Some, although willing to share, questioned the usefulness of their materials to other institutions, because of lack of finishing, or because the materials were especially adapted to their own program of presentation.

Although a relatively small proportion of the respondents who are instituting innovative techniques are conducting tests of their effectiveness, (32+%) many state that they plan to make such tests in the future. Other comments in the responses are indicative that a good many of those teaching physiology are in the early stages of trying new techniques. Several respondents stated that comparative tests of educational techniques were likely to result in misleading, equivocal, or otherwise unreliable information.

Of the 72 respondents using externally generated audio-visual materials, the most popular single source of such materials is the AMA film Library, with the second most used source being the National Medical Audiovisual Center of the National Library of Medicine. However, the pharmaceutical industry, considering all the firms together as one source, is the highest of all sources - (33.3%), and borrowing from other universities and friends is an important source (14%).

Of special interest were the added comments made by many respondents, some reinforced by reprints. Many requested being informed of new materials. About 20 responses exhibited some degree of asperity. While this may reflect in part only annoyance at being asked to respond to yet another questionnaire, I am more inclined to regard it as due to a more general disturbance with current trends in physiological education. Several responses made the point that "gadgetry" and "gimmickry" do not substitute for a good teacher. The point was made by others, however, that new and improved tools would be welcomed.

The respondents who stated a willingness to be contacted again for further information can expect some direct communication in the near future, and the list of those who are willing to assist in review of audio-visual materials will be used in assembling review panels in the coming year.

Since the analysis on which the above report was based, some additional responses to the questionnaire have come in. While they do not materially affect the statistics these are individually quite valuable to the Education Office as source material.

Anyone who did not answer the questionnaire in the first instance but who has useful information to contribute or who wishes to volunteer assistance to the Education Office in review and consultation on educational materials is encouraged to respond now. Another copy of the questionnaire will be sent on request to anyone who has misplaced the copy included with the May 1971 issue.

COMPUTERIZED SYSTEMS FOR INDEXING AND RETRIEVING INFORMATION IN PHYSIOLOGY JOURNALS*

CONSTANTINE J. GILLESPIE
National Library of Medicine
Bethesda, Maryland

The journal literature is an essential tool for physiologists, regardless of the particular area in which they work. There are approximately 60 core journals in physiology published throughout the world, journals in which the bulk of new research in physiology is reported. These are the journals which should be the primary concern of physiologists interested in keeping abreast of the developments in their field.

However, physiology is such a fundamental science, with applications and implications in so many biomedical areas, that much literature of direct interest to physiologists is published in other journals which are not exclusively devoted to physiology. The physiologist, then, must be aware of indexing and abstracting publications and of information retrieval services that can provide him with detailed access to the complete physiological literature wherever it may have been published.

There are four worldwide services which can provide assistance to physiologists through abstracting and indexing journals, through alerting and selective dissemination of information (SDI) services, and through customized computerized bibliographic services.

These services are: 1) BioSciences Information Service of Biological Abstracts (BIOSIS) which publishes Biological Abstracts and BioResearch Index; 2) the Institute for Scientific Information (ISI) which publishes Current Contents, the Science Citation Index, and the Permuterm Subject Index; 3) the National Library of Medicine which publishes Index Medicus and other derivative medical indexes; and, 4) the Excerpta Medica Foundation which publishes Excerpta Medica in 34 different subject-oriented sections.

I would like now to give you some detailed information of the abstracting, indexing, and information retrieval activities of each of these four services to show you how they can benefit you as active physiologists.

Indexing and Abstracting Services

I. BioSciences Information Service. The BioSciences Information Service covers the entire field of biology, but, naturally, includes a vast amount of information on cellular, invertebrate, and vertebrate physiology. Abstracts of 140,000 research papers are published annually in Biological Abstracts. References to an additional 90,000 research papers which cannot be abstracted and presented in Biological Abstracts

* Presented at APS Teaching Session during the Federation Meetings in Chicago, April 14, 1971.

are indexed and published in BioResearch Index each year.

BIOSIS provides four indexes for each biweekly issue of Biological Abstracts and for each monthly issue of BioResearch Index. These indexes are: 1) a subject index called B.A.S.I.C., an acronym for Biological Abstracts Subjects in Context; 2) an author index; 3) a biosystematic index; and, 4) a subject coordinating index called the CROSS Index, an acronym for Computer Rearrangement Of Subject Specialties.

B.A.S.I.C. is a computer-generated subject index which is compiled from the significant terms in the title of each article. Original terms used by the author in his title remain unchanged. The BIOSIS editorial staff then selects additional key terms from the abstract itself and from the entire original article and adds these to the end of the title. This provides additional search terms which are available to the researcher. All of these search terms are then permuted by the computer and arranged alphabetically by the search term to produce what is called a KWIC index or Key-Word-In-Context index. For example, if you are interested in "carotid sinus baroreceptors", a search is possible in B.A.S.I.C. under any of the following terms: "carotid", "sinus", or "baroreceptor". Since the term "baroreceptor" occurs far less frequently in the literature than either "carotid" or "sinus", it is faster to look under "baroreceptor" in B.A.S.I.C. In the 1970 cumulative subject index to Biological Abstracts there are 27 entries that have the word "baroreceptor" or "baroreceptors" in their titles. When you look at the title words preceding and following the word "baroreceptor" you find that most of the entries also refer to carotid sinus. The difficulty now, however, is that you have 27 abstract numbers that must be looked up in another volume in order to get the abstract and the bibliographic reference.

You will be encountering Key-Word-In-Context indexes, such as B.A.S.I.C., over and over again in many different subject areas, so it is wise to become familiar with them. Because KWIC indexes are produced from the titles of articles, it would also be wise to keep this fact in mind when you compose titles for your own papers. Make your titles as complete and informative as possible.

Key-Word-In-Context indexes have the advantage of being produced quickly and more economically than indexes produced completely by humans. They also have the advantage of giving the user multiple points of access in searching for a particular concept. Whatever subject term comes to your mind can serve as a means of searching a KWIC index for documents which interest you.

The disadvantages of KWIC indexes are the frequently poor quality of a computer printout all in upper-case letters, poor legibility, and the need to refer to another section of the index through an abstract number or reference number to find the abstract itself or the bibliographic reference. Perhaps the greatest disadvantage of KWIC indexes is the problem of synonymy in search terms. For example, if you are interested in respiratory physiology you would have to look in the index under such terms as: respiration, respiratory, breathing, air, lungs,

pulmonary, and the prefix pneumo-, to name just a few terms, in order to be certain that you hadn't missed something pertinent. If you omit a possible synonym you may miss some very important references.

The Biosystematic Index that is published with each issue of Biological Abstracts and BioResearch Index enables the physiologist to retrieve information by searching according to a particular taxonomic category associated with terms indicating the nature of the study. An example may serve to show the value of this index. If you are interested in the physiology of the nervous system of cats, the Biosystematic Index would give you a primary breakdown under CARNIVORA, a secondary breakdown under FELIDAE, and a third breakdown under abbreviated phrases which stand for "nervous system physiology" and "sense organ physiology."

The CROSS Index adds a different dimension to the indexing system of Biological Abstracts and BioResearch Index and facilitates retrieval according to subject concepts. Each abstract is printed only once in Biological Abstracts in the subject section to which it most closely relates. However, rarely is the information in abstracts limited to only a single subject concept. In the CROSS Index, therefore, the number of each abstract or the number for each reference in BioResearch Index appears under every relevant subject heading. There are approximately 600 different subject headings that are used in the CROSS Index, and this index may be used to locate all references which pertain to any one of these subject headings, or to those references which contain information in two or more subject headings. You can also use the CROSS Index as a subject coordinator by comparing the reference numbers under two or more subject headings and matching and retaining those reference numbers which are duplicated under the headings.

II. Institute for Scientific Information. The information services provided by the Institute for Scientific Information include a number of publications that can be invaluable to the physiologist. Current Contents is published in seven different subject editions. For you, the physiologist, the Life Sciences edition provides a means of keeping abreast of the articles published in your field. As its title indicates, Current Contents/Life Sciences publishes the tables of contents of every issue of approximately 1,000 different journals, enabling you to scan these lists for the titles of articles which you wish to read. Current Contents is an alerting service, a method for keeping you up-to-date on the published literature of the life sciences.

Science Citation Index is the major publication produced by the Institute for Scientific Information. The concept of citation indexing is based on the fact that when one article cites another article in its list of references there must be a subject relationship between the two articles. You are aware of this concept because this is a technique that you already use in finding articles of interest to you. You read a scientific article and then through the list of references provided with that article find other articles on that same subject that you also read. However, when you use this technique you are going from the current article you are reading now to papers that were published at an earlier date. The Science Citation Index enables you to trace the literature forward in time, that is,

to go from an earlier cited article to a later article which is citing that earlier one.

Science Citation Index is issued quarterly and cumulated each calendar year. It is published in two sections: a Citation Index Section and a Source Index With Titles. To find where a specific paper, book, thesis or technical note has been cited in a current journal article, you look in the Citation Index Section under the specific citation. You will be given the name of the author who cited the specific paper or book, and the name of the publication with its year, volume number and page number. Going now to the Source Index With Titles under the first author's name, you will find the full title of the article, the co-authors, and bibliographic data on that article.

The Permuterm Subject Index allows you to select any subject term you wish in finding relevant documents. By searching the Permuterm Subject Index under the words you have selected, you find the names of authors who have written papers on that subject. Proceeding then to the Source Index With Titles you will find the full titles, the co-authors and the bibliographic data for these documents.

The Permuterm Subject Index is a subject list similar in content (but not in format) to the KWIC indexes I mentioned earlier. It is a computer-generated permutation of all the possible pairs of terms in the titles of the publications that have been indexed. Consequently, it suffers from the same disadvantages of being based solely on the words in the titles of papers. This means that you, as the user of the index, must keep all possible synonyms in mind when you are searching for references in your area of interest.

III. National Library of Medicine. The National Library of Medicine publishes Index Medicus each month and then cumulates these issues annually to produce the Cumulated Index Medicus. Approximately 220,000 articles from 2,200 worldwide biomedical journals are indexed each year. Included, of course, are most of the core physiology journals as well as hundreds of other journals which contain articles of interest to physiologists.

Each issue of Index Medicus is published in four sections: 1) a subject index to review articles; 2) an author index to review articles; 3) a subject index to all the articles indexed; and, 4) an author index to all the articles indexed. Index Medicus differs from the other indexes that I have mentioned in that all of the subject indexing is done by professional indexers and not by the computer. Also, the indexing is not based just on the words in the title as KWIC indexes are, but on the important concepts described throughout the entire article. Consequently, the vocabulary of indexing terms is drawn from a controlled set of some 7,600 terms and not freely from any word that may come to mind. This controlled vocabulary has the decided advantage of eliminating the problem of synonyms and of bringing like concepts together under the same subject heading. On the other hand, a controlled indexing vocabulary has the disadvantage of being behind the times in relation to new terminology that is used in the literature. New concepts must be indexed under

subject headings that already exist in the controlled vocabulary, although provisions have been made by the National Library of Medicine to update the vocabulary on an annual basis. Thus, many new or specific concepts get lost under broad concepts and it is difficult to find documents of specific interest. Take, for example, the concept of "adhesiveness of cells." The Index Medicus vocabulary has no specific term for "adhesiveness" and this concept must be indexed under a broader term which is in the vocabulary. In Index Medicus the concept of "adhesiveness" is indexed under the broader term "Surface Properties." There are many dozens of entries under "Surface Properties", but, of course, adhesiveness is only one of many different surface properties indexed under this subject heading. The user of Index Medicus must look at every article title to see which mentions "cell adhesiveness" or some kind of "cellular" term in order to get at the specific references he wants.

Index Medicus has another advantage to the busy user in its method of presentation of index entries. The complete citation, with authors' names, full title of the article, and full journal reference, are all printed under each subject entry. There is no reference or citation number that the user must refer to in another section of the index in order to get the full bibliographic information that he needs. If you look under the subject heading "Startle Reaction", for example, you will have all the information right there to determine which articles you wish to consult, including an abbreviation indicating the language in which the original article is written, if it is not in English.

Since Index Medicus is produced by a computer-driven phototype-setter, the Photon 901, the quality of the printing is excellent, with upper and lower case characters, diacritical marks, different type sizes, and special characters that increase the legibility and use of the publication and also make it less bulky. None of the other indexes that I have mentioned can match the quality of the printing in Index Medicus.

IV. Excerpta Medica Foundation. *Excerpta Medica* is published in 34 different specialty areas, including an edition devoted to physiology. Each issue of each specialty journal contains the abstracts for hundreds of biomedical articles relating to that specialty, an author index, and a subject index. The author and subject indexes are cumulated annually.

The index terms for each abstract are derived from a controlled thesaurus called Master List of Medical Indexing Terms, or MALIMET. This is a compilation of approximately 60,000 preferred biomedical terms with their known synonyms. This controlled list is far bigger than the controlled vocabulary used by the National Library of Medicine because it includes many more specific terms.

The subject indexing for *Excerpta Medica* is not done by the computer but by a human staff of indexers who select the most appropriate terms that describe the content of the document. The computer is then used to prepare the subject index by taking each indexing term that was assigned and listing it in its proper alphabetic sequence, following it in that same entry with all the other index terms that were used for that abstract, and, finally, giving the abstract number. Thus, you might

have an index entry that reads:

endplate potential, acetylcholine receptor,
acetylcholine receptor membrane potential,
kinetic model, lidocaine, neuromuscular
synapse, frog, 474

This entry is alphabetized under endplate potential, but each of the other index terms: acetylcholine receptor, kinetic model, etc., would serve as an alphabetization point with all of the other index words listed after it in a permuted fashion.

Beginning in 1969, with the establishment of the Excerpta Medica Automated Storage and Retrieval Program of Medical Information, the total Excerpta Medica operation became completely computer-based. Its abstracts and indexes are computer-processed and its journals are electronically composed using the RCA-VideoComp device. Thus, the printing quality is comparable to hot-type composition.

There are many similarities between Excerpta Medica and Index Medicus in that they both cover the same subject area, they both use a controlled indexing vocabulary rather than the natural language that BIOSIS and ISI use, and they both produce their publications on computer-driven phototypesetters rather than on the high-speed printer.

INFORMATION RETRIEVAL SERVICES

All of the organizations that I have been speaking of offer computerized information retrieval services. These retrieval services are an adjunct to, and at the same time, a byproduct of the considerable effort that is required to produce their valuable indexing and abstracting journals.

The printed publications allow the user to conduct his own information retrieval in a manual fashion, and in many cases a manual search is quick, efficient, and complete. For simple, narrowly-defined inquiries, a manual search through an index can provide exactly the information you need. If your topic of interest, for example, is "ovulation", then B. A. S. I. C., the subject index to the physiology section of Excerpta Medica, the subject index to Index Medicus, and the Permuterm Subject Index can all provide a rapid, manual search which will yield an abundance of references. In Excerpta Medica and Index Medicus, because of their controlled indexing vocabularies, the single term "ovulation" is all that you need consult. In B. A. S. I. C. and the Permuterm Subject Index the keywords "ovulate", "ovulated", "ovulating", and "ovulatory", as well as "ovulation" must be searched to get complete results.

At other times, however, in very complex inquiries or in inquiries that have many different parameters, it would be impossible for you, a human, to conduct a manual search in any reasonable time with any hope of true success. It is here that the computer search can save the researcher or his assistant days or even weeks of time in literature searching and at the same time produce more conclusive results. Let us now

talk about the computerized search services offered by these organizations.

I. BioSciences Information Service. BIOSIS provides retrospective computerized searches of the complete indexes to Biological Abstracts and BioResearch Index back to 1959, with a total of over 1.2 million documents being machine searchable. An average of nineteen index tags for every reference in the BIOSIS files permits information retrieval from many different access points. As I've already mentioned, BIOSIS indexes each reference by each author's name, by the taxonomic category of all plants and animals involved, by keywords in the author's title and in the supplementary terms added by the BIOSIS editors, and by subject category. BIOSIS places no restrictions on the terms authors and editors may use, and, consequently, their keyword index is always current and new terminology can be searched just as soon as it appears, with no need for the existing files to be updated.

A BIOSIS search is exactly tailored to the information needs of the requester. Trained biologists on the BIOSIS staff prepare the search strategy for each question, using their expert knowledge in manipulating the BIOSIS files which contain almost 400,000 keyword, subject, and taxonomic terms. A specialist in physiology will analyze your request and devise the best possible combination of search terms that will satisfy your information need. After the computer has processed the search and produced its output, the search strategist examines it and selects the abstracts and citations which are most pertinent to your interest.

Combinations of index tags in the search "logic" allow fine discrimination by combining keywords with each other and with subject and taxonomic concepts. For example, a search question might ask, "What papers were published in 1970 on the effect of chlorinated hydrocarbons on the liver of foxes?" One way to answer the question would be to have the computer retrieve all the references which mention any chlorinated hydrocarbon in the title and which involve the subject concept "digestive system physiology", and which bear the taxonomic affiliation "CANIDAE." The search strategist would then edit the computer output in order to delete references to all volumes of Biological Abstracts and BioResearch Index except those from 1970, to all digestive organs other than the liver, and to all CANIDAE except the fox.

The references that the BIOSIS staff selects as "appropriate" responses to the search question depend on the wishes of each individual scientist. Some scientists will be interested only in papers which directly pertain to their interests while others will prefer to browse through marginal papers as well. A few scientists may hope to receive nothing at all, thus indicating that their own experiments can be conducted without fear of duplicating someone else's research.

The output that is mailed to the scientist contains copies of the abstracts from Biological Abstracts, printed from microfilm files, and bibliographic citations from BioResearch Index. An average of 80 references per question is supplied by BIOSIS.

A saving in cost is possible for the scientist if he asks that BIOSIS send him the entire computer printout of retrieved abstract numbers and citation numbers. In this manner the scientist does not pay for the post-editing usually done by the BIOSIS staff. The scientist, however, must spend his own valuable time in locating, reading and copying abstracts.

What is the cost of a BIOSIS search? BIOSIS charges a minimum of \$150 for each search, taking into account that each search requires a trained biologist's time to formulate the search, computer time to process the search, and finally, the biologist's time again to edit and analyze the computer output. Of course, these three factors that go into every search vary significantly from search to search, and, although many searches will cost only \$150, other highly complex searches may run to much higher costs. Naturally, the BIOSIS staff will estimate in advance what the time, cost and probable yield of your question will be.

II. Institute for Scientific Information. The Institute for Scientific Information has recently instituted its new ISI Search Service through which it is possible to obtain a retrospective search of the literature on a specific topic using ISI's data bank. Heretofore, ISI's computerized search services have been limited to a selective dissemination of information system called ASCA IV. ASCA IV is the acronym for Automatic Subject Citation Alert and is the fourth generation of this service which ISI first introduced in 1965.

Through the ASCA IV system, the user prepares a profile entry form on which he indicates the specific areas of information that he wants searched in providing him with a personalized computer printout report.

In word questions you can ask the ASCA system to find current articles that include certain single words, phrases, or words with certain stems in their titles. Your profile may include negative terms, terms that will eliminate the retrieval of any titles containing that term. Other types of word questions ask for specific words, or specific phrases and will retrieve only those titles which contain these words or phrases.

Cited reference questions allow you to learn what articles in current journals cite a particular earlier work, while cited book questions enable you to learn where a particular book is being cited. You can find out what items in current journals cite the work of a particular author by asking a cited author question. With a cited journal question you are alerted to all articles citing a particular journal. By asking a source author question you are alerted to what a particular author has published. Similarly, a source journal question gives you a listing of all the items published in a given journal.

Any or all of these different items may be included in your search profile and a computer printout will be sent to you each week listing the documents that have satisfied your request.

The cost of ASCA IV service is based on the number and kind of questions you have asked. Each source journal question, for example,

costs \$7. Each cited author question costs \$9. Each cited reference question costs \$3. These costs are modified, however, depending on the frequency of use of the term. A source journal question on the American Journal of Physiology, for example, costs \$30 rather than \$7 because it is a high frequency source journal. Specific word questions cost \$7 per word; however, some words occur so commonly that a higher charge is made; for example, \$8 for the word "electrophysiological", \$25 for the word "adrenergic", \$16 for the word "immunoglobulin", and \$28 for the word "nervous." Costs are reduced, however, when combinations of words or combinations of source journals with other terms are requested. The minimum annual subscription fee for ASCA IV is \$115.

III. The National Library of Medicine. There are two types of bibliographic searches that are available through the National Library of Medicine's MEDLARS system: retrospective demand searches and recurring demand searches. Retrospective searches are searches conducted in response to very specific questions from researchers, questions that use the computer's great ability to rapidly compare the parameters that have been asked for in the search against the terms that have been used to index hundreds of thousands of documents. Each question that is submitted is analyzed by highly trained MEDLARS analysts who prepare a formulation by listing all the index terms that are applicable to the question. The search terms are then arranged in a logical statement written in Boolean algebra and batched with other searches to be processed against the MEDLARS files. The MEDLARS files are searched in two segments, a current segment corresponding to the January 1968 through May 1971 issues of Index Medicus and containing approximately 765,000 citations, and a back-file segment corresponding to the January 1964 through December 1967 issues of Index Medicus and containing an additional 641,000 citations.

In contrast to BIOSIS searches which retrieve only abstract numbers and reference numbers, MEDLARS searches retrieve the complete bibliographic data on file. The output from the computer is a complete listing of all the references which satisfied the search request. The bibliography contains the authors' names, the title of the article, the journal reference, pagination and date, and a listing of all the subject headings that were used to index that document. An average of 178 references is retrieved for each search request.

MEDLARS bibliographies are reviewed by the search analyst before being sent to him to check the accuracy and completeness of the retrieval and to determine if it is fully responsive to the requester's stated need. If only partially responsive, the bibliography will be sent to the requester and he will be informed that a supplementary bibliography will be prepared and sent to him later. MEDLARS searches do not require the detailed post-editing that BIOSIS searches require. For example, if a requester is only interested in citations to articles that were published during 1970, the year of publication is included as one of the elements in the search formulation and the computer will retrieve only those citations with a 1970 publication date. BIOSIS requires that the search strategist post-edit and remove those retrieved items that do

not fall within the wanted time period.

The other searches that MEDLARS provides are the recurring demand searches. This is an alerting service which enables researchers to receive a bibliography once each month which contains all the new citations in his area of interest that were added to the data base since the previous month. Most recurring demand searches started out as retrospective searches which brought the requester up to date and were then processed each month thereafter, with little or no change in the formulation, as a current awareness tool.

There are 14 regional MEDLARS centers located throughout the United States which are responsible for formulating searches for a particular geographic area. Four of these MEDLARS centers also serve as computer processing centers and about 20,000 MEDLARS searches are processed each year.

MEDLARS is the only computerized search service which does not charge a fee for its services. Although its operating costs are extensive, it exists as a public service of the United States Government.

IV. Excerpta Medica Foundation. The Excerpta Medica Automated Storage and Retrieval Program of Medical Information provides demand bibliographic services and selective dissemination of information services similar to those produced from MEDLARS. Since 1969, when this automated system went into full operation, Excerpta Medica has been adding 200,000 citations and 80,000 abstracts annually to its data bank. Rapid search and retrieval of this information is possible with the output being made available to requesters on magnetic tape or as hard copy printout.

CONCLUSIONS

I have briefly covered four different organizations that can provide substantial help to physiologists. It is important to realize, that, although the four services cover much of the same literature, they each do it in a different way and provide different products. Two of the services provide abstracts as well as indexing. The other two services provide indexing only, and the titles of the documents and the terms that were used to index them may not be sufficient to tell you if they can be of use to you, in many cases. This means that you will have to go to the document itself, in some cases, before accepting or discarding it for your purposes.

Obviously, the abstracts give you much more information and can speed up your literature searching considerably.

No one of these services should be used to the complete exclusion of the others because no one service is so complete or all-encompassing that it can serve all of your information needs all of the time. Keep all of these services in mind. Use all of them but pick the best features of each in relation to specific problems that you have to solve.

SENIOR PHYSIOLOGISTS

Members of the Committee on Senior Physiologists, Gene Landis, Hi Essex, Hal Davis and Bruce Dill, send birthday greetings to members beginning with their 80th birthday. Recently President Cliff Barger regretfully accepted Gene Landis' resignation and appointed Hy Mayerson in his place. The following excerpts are arranged in the order of year of birth.

1871, Charles D. Snyder who was 100 years old on April 30 expressed to Hal Davis appreciation of the honor paid him at the Society meeting in April. "I am feeling fine and now ready to start my second round."

1872, Mabel Purefoy FitzGerald was 99 years old August 3. Albert Rooke, Secretary to the Lord Mayor of Oxford obtained this information through Mabel's next door neighbor, Mrs. Brett-Smith. She reported that Mabel is mentally alert but had the misfortune of a recent burglary from her home of porcelain and silver to the value of several thousand pounds. Mrs. Brett-Smith passed on a note, handwritten by Mabel, that included date and place of birth and the correct spelling of her full name.

1878, George Whipple, 93 on August 28, writes that he and his wife "do not chase around very much."

1880, Helen Tredway Graham died in April 1971. She was a distinguished member of the Society, professor emeritus of pharmacology at Washington University School of Medicine and active in a wide range of educational and civic affairs.

1881, W. R. Hess celebrated his 90th birthday on March 17. He expresses appreciation to Gene Landis for the birthday greeting and made the following observations. "From colleagues who have visited laboratories in the U. S. S. R. I learn how well the Russian research workers are acquainted with what is going on in the world. On the other hand, when looking through the literature of Great Britain or the States, physiology seems to be existent only and exclusively in those two countries. Pavlov at his time was universally known. His successor, Beritoff, who matches his teacher in stature is hardly taken notice of. It is a situation which closely resembles that existing in Germany at the time of Ludwig."

1883, Frank A. Hartman, pioneer in studies in adrenocortical function, died March 21, 1971. He was professor of physiology at Ohio State from 1934 until retirement and a member of the Society for 55 years.

1884, Walter Alvarez is as busy as ever. He wrote Hi Essex that his library "has over 800 remarkable autobiographies of men and women who were ill or injured or born wrong in one way or another. I hope some psychiatrists will use it."

1885, Norman Keith has sold his home in Rochester and moved to Madonna Towers in North Rochester. He is in excellent health.

1886, E. C. Kendall was in Rochester in the summer autographing his book for purchasers. He is recovering from a gall bladder operation performed recently at Princeton, N.J.

1891, Fred Hitchcock greeted Hi Essex at Christmas expressing appreciation for the birthday card and recalling pleasant times together on the Council.

1891, Jerzy Kaulbersz who was 80 on July 19 attended the Congress at Munich and enjoyed greeting old friends. Afterwards he went to the Jungfrauoch to study pulmonary diffusing capacity in exercise at that altitude.

1891, Esther Greisheimer sent Christmas greetings to Hi Essex, chronicling the year's events. She has read three galleys of her book. She expressed appreciation to our Committee for the birthday greeting.

1891, Friends of Bruce Dill gathered in Las Vegas in April to help him celebrate his 80th birthday. Former and present colleagues were invited by Bruce's associate, M. K. Yousef to present papers at a two-day symposium on Physiological Adaptations: Desert and Mountain. This will be published by Academic Press. Bruce's daughter Betty and her husband Steve Horvath assembled and bound a magnificent collection of letters from friends. Among those attending was another 80 year-old, Fred Hitchcock, and two colleagues from Stockholm, E.H. Christensen and P. O. Astrand.

1891, Wilder Penfield wrote, thanking Hal Davis for the birthday greetings. He states, "by the calendar, I am certainly a senior physiologist. But I have never stopped to realize such things and try not to do so even on my birthday. Last October, Mrs. Penfield and I went to Munich for the combined meeting of the Neurological Society of France and the Deutsche Gesellschaft fur Neurologie which was celebrating the first stimulation of the motor cortex by Fritsch and Hitzig 100 years ago. I gave a memorial address and was lucky enough to be awarded the Erb Medal which has been accepted by such friends of mine as Otfried Foerster. Except for such occasional addresses that have to do with cortical physiology, I am not carrying out any active physiological studies. But I am very busy writing the story of the Montreal Neurological Institute at the present time. I hope to finish it within six months or a year."

1891, McKeen Cattell acknowledged the birthday greeting and added, "I have been emeritus since 1959, but am fortunate in retaining an office at the Cornell Medical Center. My chief occupation is editing the Journal of Clinical Pharmacology, but I am also working with a number of committees of the New York Academy of Medicine and other organizations."

WALLACE O. FENN
1893-1971

Dr. Wallace Osgood Fenn, Distinguished University Professor of Physiology at the University of Rochester School of Medicine and Dentistry, died Monday, September 20, 1971, at his home after a long illness. He is survived by his wife, two sons, two daughters and thirteen grandchildren.

He was born on August 27, 1893 in Lanesboro, Massachusetts. He received his A.B. (1914), his M.S. (1916) and his Ph.D. (1919) from Harvard. From 1919 to 1922 he was Instructor in Applied Physiology under Cecil K. Drinker at Harvard. From 1922 to 1924 he was Traveling Fellow of the Rockefeller Institute with A. V. Hill and Sir Henry Dale in England. In 1924, at the age of 31 he was appointed Professor of Physiology at the newly formed School of Medicine and Dentistry at the University of Rochester, and remained there as Chairman of the Department for 35 years. In 1959 he became Distinguished University Professor of Physiology and in 1962, Director of the Space Science Center of the University.

He received many national and international scholastic and academic honors and awards. It is not our purpose here to cite all of these nor to cite his many and varied research contributions but rather to emphasize his great contributions to the development and organization of national and international physiology.

Dr. Fenn served as chairman of innumerable committees as advisor for the National Academy of Sciences, the National Research Council, the National Institutes of Health, the Armed Forces and the National Space Agency as well as holding important posts in the American Physiological Society, the American Institute of Biological Sciences, the International Union of Physiological Sciences, etc.

Dr. Fenn served long and effectively on the Board of Publication Trustees of the American Physiological Society. He was a member of the Board from its inception in 1933 until it became the Publications Committee of the Society in 1955, serving as chairman of the Board from 1950 to 1955. He was chairman of the Board when it provided the means to purchase Beaumont, insisting that Beaumont be the home of the Federation. The APS Handbook series was suggested and implemented during his last year as chairman and he co-edited the Respiration Section of the Handbooks of Physiology with Dr. Rahn. Also during his term on the Board he was instrumental in the founding of the Journal of Applied Physiology in 1948. He and others felt that much of the applied physiology done during the war (WWII), particularly human physiology with emphasis on man and his environment, should be published in the scientific literature. APS was the organization to do it, thus the birth of the Journal of Applied Physiology.

Another of Dr. Fenn's publication contributions was the History of the American Physiological Society; Third Quarter Century -1937-1962 published in 1963 with Fenn as Editor and compiler. Much of Dr. Fenn's

contributions to the development of the Society can be found in these pages if one overlooks his extreme modesty.

Dr. Fenn was not only interested in the publications of the Society but its organization and other functions as well. He served as Treasurer from 1937-1940; Secretary from 1943-1946; and President from 1946-1948. During his Presidency the elected offices of Secretary and Treasurer were eliminated and these duties assumed by an appointed Executive Secretary-Treasurer. Dr. Milton O. Lee assumed this position along with that of Executive Secretary of the Federation in 1948. The term of President was limited to one year. The only officer to be elected was President-Elect who served on Council for one year (acting as Council Secretary); then became President for one year; and finally Past-President for one year.

Also during Dr. Fenn's Presidency the APS Fall Meetings were instituted. The purpose was to draw some papers away from the overcrowded program of the Federation Meeting and to provide a smaller meeting which was more conducive to friendly social gatherings. The first Fall Meeting was held in Minneapolis in September of 1948. At this meeting the custom of having a Past-President address was instituted by Dr. Visscher then President. Dr. Fenn's "Physiology on Horseback" (AJP 159, 551-555, 1949), the first of these addresses, is a masterpiece.

Dr. Fenn's interests and energies were not confined to APS. He helped Dr. Bronk revitalize the old Union of American Biological Societies into the American Institute of Biological Sciences and succeeded in getting the APS to be the first Charter Member of AIBS in 1948. Dr. Fenn was always a champion of AIBS and served as its President from 1957-1958.

His interests were also international in scope. He served as a member of the Council of the International Union of Physiological Sciences in 1956; was Secretary General from 1959-1965; presided as President of the XXIV Congress in Washington in 1968; and was at that time, on his 75th birthday, unanimously elected President of IUPS. After the Leiden Congress in 1962 he started the IUPS Newsletter which today reaches physiologists all over the world. He compiled and edited the History of the International Congresses of Physiological Sciences 1889-1968 and arranged to have a copy for everyone attending the 1968 Washington Congress. He also promoted the inclusion of Satellite Symposia as an official activity of the International Congresses.

The Dutch composer Jurriaan Andriessen dedicated to Dr. Fenn his "Respiration Suite" (written for double wind quintet) first performed at the First International Respiration Dinner Group meeting at Alphen aan de Rijn, Holland on Sept. 12, 1962 during the time of the Leiden Congress. On the jacket of the recording is the statement:- "An understanding of the musical performance of these artists, in a physiological sense, rests to a large extent on the work of Dr. Wallace O. Fenn and his associates on pressure-volume relationship of the lungs and chest, on the composition of alveolar air during breath holding, and on physiological effects of pressure breathing."

The American Physiological Society will long remember Wallace Fenn as one of its most distinguished and influential leaders.

R. G. D.

NRC RESEARCH ASSOCIATESHIP PROGRAMS

The National Research Council announces its Research Associateship programs for 1972. These programs afford qualified scientists and engineers opportunities for postdoctoral research on problems of their own choice in a variety of scientific disciplines and fields of specialization. The programs are conducted on behalf of and in cooperation with certain Federal research organizations with laboratories at more than 80 geographic locations in the United States.

Applications for these competitive awards will be received by the National Research Council until January 15, 1972. Appointments will be made in March for tenure to begin on or after July 1, 1972. Stipends, which are subject to income tax, will vary according to the type of appointment, but will not be less than \$13,000.

Further information and application materials can be obtained from the Associateship Office, JH 606, National Research Council, 2101 Constitution Avenue, Washington, D. C. 20418.

NEW MEDICAL SCHOOLS

Five new medical schools will open this fall to 374 first-year students, bringing the total number of medical schools to 108. The new schools are: Univ. of Nevada School of Medical Sciences, Reno, Nevada; Univ. of South Florida College of Medicine, Tampa, Florida; Rush Medical School, Chicago, Illinois; Univ. of Missouri-Kansas City School of Medicine, Kansas City; and the State Univ. of New York at Stony Brook Health Sciences Center-Medical School, Stony Brook, Long Island.

IV INTERNATIONAL CONGRESS OF ENDOCRINOLOGY

The Fourth International Congress of Endocrinology will be held June 18-24, 1972 at the Sheraton-Park Hotel, Washington, D.C. Abstracts of short communications are invited which provide new data or are concerned with new concepts and principles in the field of endocrinology. The Congress will also include symposia, special technique sessions and workshops on methods.

For further information write (before Dec. 15, 1971 if a presentation is to be considered):

Secretariat
IVth International Congress of Endocrinology
Suite 700, 1629 K Street, N.W.
Washington, D.C. 20006

CARDIAC METABOLISM

The 5th Annual Meeting of the International Study Group for Research in Cardiac Metabolism will be held in Winnipeg, Canada during June 27 to 30, 1972. Three symposia, namely: myocardial hypertrophy, newer aspects of myocardial metabolism and regulation of calcium in heart have been organized. In addition a special program on recent advances in heart biology and nine general sessions for free communication have been scheduled. Last date for the receipt of abstracts and advance registration is April 15, 1972. For further information please write to:

Dr. N. S. Dhalla, Dept. of Physiology, Faculty of Medicine, University of Manitoba, Winnipeg 3, Canada.

SATELLITE SYMPOSIUM

One of the satellite symposia immediately following the International Pharmacology Congress may be of particular interest to physiologists.

The symposium is entitled "Pharmacological Aspects of Temperature Regulation" to be held in the Sheraton-Palace Hotel, San Francisco, July 29-31, 1972.

For further information please write:

Dr. Peter Lomax
Dept. of Pharmacology
School of Medicine
The Center for Health Sciences
University of California, Los Angeles
Los Angeles, California 90024

NEED FOR PHOTOGRAPHS

For use in developing career guidance brochures and for other purposes, the Education Office is in need of good photographs of physiologists at work, in the research laboratory, the classroom and the field.

Although color photographs (transparencies) will have the widest utility, good black and white pictures (8 x 10 glossy prints) will also be useful. Each photograph should be accompanied by a brief description of what the picture portrays and identify all individuals.

Respondents to this request for photographs should direct them to the Education Office, American Physiological Society, 9650 Rockville Pike, Bethesda, Md. 20014.

ERRATA

The Physiologist, Abstract Issue, Vol. 14, No. 3, August 1971, page 173.

"Activity of Single Sympathetic Postganglionic Nerve Innervating Muscle." K. Koizumi and A. Sato.

2nd line - "rats" - should read "cats"

20th line - "200/sec" - should read "20/sec"