

QH
431
.S692
12
1980

UNIVERSITY OF MISSOURI
AGRICULTURAL EXPERIMENT STATION

STADLER GENETICS SYMPOSIA

Volume 12

Edited by
G.P. Rédei

L.J. Stadler

Columbia, Missouri 1980

COPYRIGHT 1980
The Curators of the University of Missouri
ALL RIGHTS RESERVED

This book may not be reproduced, in whole or in part, except
by reviewers for the public press, without written permis-
sion from the publisher.

LIBRARY OF CONGRESS CATALOG CARD NUMBER 79-635774

International Standard Book Number (Vol. 12) 0-912360-11-6

The STADLER GENETICS SYMPOSIA volumes are published by the
Missouri Agricultural Experiment Station
117 Curtis Hall
University of Missouri
Columbia, MO 65211 USA

and may be purchased directly or through booksellers. The price
of this volume is \$7.00. Please remit also 75¢ for postage and
handling. Missouri residents must pay an additional 24¢ for
sales tax.

Account Number 9738-2225

UNIVERSITY OF MISSOURI
AGRICULTURAL EXPERIMENT STATION

STADLER GENETICS SYMPOSIA

Volume 12

Edited by
G.P. Rédei

Columbia, Missouri 1980

ACKNOWLEDGMENTS

The 12th Stadler Genetics Symposium was financed by the Department of Agronomy, Division of the Biological Sciences, the Graduate School, and the School of Medicine of the University of Missouri-Columbia. The Chancellor of the University of Missouri-Columbia, Dr. Barbara S. Uehling, provided a quasi-endowment fund to secure the continuation of these Symposia. Two lectures were supported by the U. S. Department of Agriculture Research Service, Mid-Great Plains Area.

The participants wish to express their thanks to Mrs. Mary Kay Doyle and to other wives of the Genetics Faculty who organized the social program of the Symposium.

We are much indebted to Professor Richard Hills and his colleagues, who entertained the participants at the banquet with their delightful music.

Many thanks are due to the graduate students who managed the projection with great skill and enthusiasm. Carlos Alonzo-Arnedo deserves our appreciation for the photographs.

Mark T. Bassett prepared the typescript for printing and completed the layout. The financial matters of these Symposia are managed with great efficiency by Fran Malloy, Fiscal Officer of the Graduate School.



STADLER GENETICS SYMPOSIA

CONTENTS

VOLUME 12 (1980)

Acknowledgments	2
Contents	3
Participants	4
E. R. Sears Scholarship Fund	8
Monica Riley	
EVOLUTION OF THE BACTERIAL GENOME	9
Judith H. Miles	
MEDICAL GENETICS: IMPACT AND STRATEGY	33
Jeffrey C. Hall, Richard W. Siegel, Laurie Tompkins and C. P. Kyriacou	
NEUROGENETICS OF COURTSHIP IN <i>DROSOPHILA</i>	43
Takeo Maruyama and Eiichi Soeda	
MOLECULAR EVOLUTION IN PAPOVA VIRUSES AND THEIR HOST SPECIES, AND IN BACTERIOPHAGES	83
Charles M. Radding, Chanchal Das Gupta, Takehiko Shibata and Richard P. Cunningham	
THE TOPOLOGY OF HOMOLOGOUS PAIRING	97
Judy D. Wall	
NITROGEN FIXATION BY PHOTOSYNTHETIC BACTERIA	107
T. O. Diener	
VIROIDS: MINIMAL GENETIC SYSTEMS	123
G. Nigel Godson	
EVOLUTION OF DNA SEQUENCE: MECHANISMS AND MODELS AS SEEN IN SMALL PHAGES	143
Maurice Green, William S. M. Wold, Karl H. Brackmann, Takumi Matsuo, Shuichi Hashimoto and Janey Symington	
THE INTEGRATION AND EXPRESSION OF HUMAN DNA TUMOR VIRUS GENES	171
Cumulative Contents of the Proceedings of the Stadler Genetics Symposia	205

● For information on prices and ordering of the volumes of these symposia, please see page 208. ●

PARTICIPANTS

- Abdelmoeti, Mohamed, 3347 Starr, Lincoln, NE 68503
 Acedo, Gregoria, 117 Curtis Hall, U. of Missouri, Columbia, MO 65211
 Aeschlimann, Lawrence, 317 N. Louisiana, Cape Girardeau, MO 63701
 Albert, Patrice S., 310 Tucker Hall, U. of Missouri, Columbia, MO 65211
 Alcorn, Mary Ellen, M121 Med. Sci., U. of Missouri, Columbia, MO 65211
 Aldridge, Michael L., 25B Graham Hall, U. of Missouri, Columbia, MO 65211
 Alonso-Arnedo, Luis Carlos, 220 Curtis, U. of Missouri, Columbia, MO 65211
 Alverson, Bill, Biol. Dept., Rebstock Hall, Wash. Univ., St. Louis, MO 63130
 Aria, Mehdi, Biol. Dept., Pittsburg State Univ., Pittsburg, KS 66762
 Audesirk, Gerald, Div. Biol. Sci., U. of Missouri, Columbia, MO 65211
 Audesirk, Teresa, Rt. #5, Columbia, MO 65201
 Aurand, Aaren, Mark Twain, 515 S. 5th St., Columbia, MO 65201
 Ball, Mary, Dept. Zoology-Entomology, Auburn Univ., Auburn, AL 36830
 Barker, Tom, 102 Curtis Hall, Univ. of Missouri, Columbia, MO 65211
 Beckett, Jack B., Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
 Bennett, Jack, Dept. of Biol. Sci., Northern Illinois Univ., DeKalb, IL 60115
 Bennetzu, Jeffrey, Box 1137, Washington Univ., St. Louis, MO 63130
 Benton, Gary, Dept. of Biology, Washburn Univ., Topeka, KS 66621
 Berg, David, 609 Manor, Columbia, MO 65201
 Biggers, Charles J., Biol. Dept., Memphis State Univ., Memphis, TN 38152
 Bishop, Dean S., Biol. Dept., Pittsburg St. U., Pittsburg, KS 66762
 Blevins, Dale G., Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
 Bogorad, Lawrence, Biol. Lab., Harvard Univ., Cambridge, MA 02138
 Braver, Gerald, Dept. of Zoology, Univ. of Oklahoma, Norman, OK 73069
 Brawn, Robert I., Funk Seeds Intnl., Box 2911, Bloomington, IL 61701
 Broome, Joe R., Dept. of Biol., Memphis State Univ., Memphis, TN 38152
 Bryant, Stephen H., Dept. of Biol., Western Ill. Univ., Mecombe, IL 61455
 Burkholder, John, McPherson College, McPherson, KS 67460
 Bussard, James, 204 Curtis Hall, U. of Missouri, Columbia, MO 65211
 Carpenter, Charles, 3106 Blackberry Lane, Columbia, MO 65201
 Chang, Ming-Tang, 203 Curtis Hall, U. of Missouri, Columbia, MO 65211
 Chow, Shirley, Biol. Dept., Pittsburg State Univ., Pittsburg, KS 66762
 Churchill, Kathy, 411 Snow Hall, Kansas Univ., Lawrence, KS 66045
 Citron, Bruce, Biochem. Dept., Univ. of Iowa, Iowa City, IA 52242
 Clark, C. H., Biol. Sci., U. of East Anglia, Norwich NR4 7TJ, England
 Coe, E. H., 210 Curtis Hall, Univ. of Missouri, Columbia, MO 65211
 Cole, Betty, Dept. of Biol., Washburn Univ., Topeka, KS 66621
 Cotton, Jenny, Dept. of Biol., Berea College, Berea, KY 40404
 Crawford, Nancy, Dept. of Biol., Washburn Univ., Topeka, KS 66621
 Curram, Edward M., 1802 E. Broadway - 3W, Columbia, MO 65201
 Curtis, Christine, Dept. of Agronomy, U. of Missouri, Columbia, MO 65211
 Davidson, Dan, Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
 Davis, William, 1634 Towne Dr., Apt. 3A, Columbia, MO 65201
 DeSalle, Rob, Dept. of Biol., Washington Univ., St. Louis, MO 63130
 DeSousa, Francisco B., 205 Waters Hall, U. of Missouri, Columbia, MO 65211
 Diener, Theodore O., USDA, ARS, Plant Virol. Lab., Beltsville, MD 20705
 Doyle, G. G., 219 Curtis Hall, Univ. of Missouri, Columbia, MO 65211
 Dudgeon, Edna, P. O. Box 1014, Cape Girardeau, MO 63701
 Dyrho, Grant L., Southern Missouri State Univ., Springfield, MO 65802
 Eisenstark, A., 105 Tucker Hall, Univ. of Missouri, Columbia, MO 65211
 Eizenga, Georgia, N-122 Agric. Sci., Univ. of Kentucky, Lexington, KY 40546
 Elseth, Gerald D., Biol. Dept., Bradley Univ., Peoria, IL 61606
 Emerich, David W., 322A New Chemistry, Univ. of Missouri, Columbia, MO 65211
 Erwin, Christopher, 700 Sunset St., Iowa City, IA 52240
 Estervig, Dave, 260 Appletree Ct., Apt. 7, Columbia, MO 65201

- Estervig, Gail, 260 Appletree Ct., Apt. 7, Columbia, MO 65201
 Evensen, Kathleen, 101 Tyson Bldg., Penn. State U., Univ. Park, PA 16802
 Flor, Will, 105 S. Spanish St. #102, Cape Girardeau, MO 63701
 Ford, Clark, 547 Hawkeye Dr., Iowa City, IA 52240
 Foster, Mark, Dept. of Biol., Washburn Univ., Topeka, KS 66621
 Francis, G. R., Dept. of Anatomy, Neurology, Wash. U., St. Louis, MO 63110
 Freter, Greg A., 721 Mikel St., Columbia, MO 65201
 Frost, Carey, Dept. of Biol., Pittsburg State Univ., Pittsburg, KS 66762
 Gavan, James, Univ. of Missouri, Columbia, MO 65211
 Geissler, Willie, Dept. of Biol., Washburn Univ., Topeka, KS 66621
 Gibbs, Donald, Dept. of Biol., Rockhurst College, Kansas City, MO 64110
 Gillian, T. Conrad, 1409 University #3, Columbia, MO 65201
 Gilmore, R. A., Biochem. Dept., Marshall U. Med. Sch., Huntington, WV 25701
 Godfrey, Joe, Dept. of Biol., Washburn Univ., Topeka, KS 66621
 Godson, G. Migel, Radiology Lab., Yale Univ., New Haven, CT 06510
 Golden, James W. II, 12H University Terrace, Columbia, MO 65201
 Golden, Susan S., 110 Tucker Hall, Univ. of Missouri, Columbia, MO 65211
 Golomb, Miriam, Div. Biol. Sci., Univ. of Missouri, Columbia, MO 65211
 Gonzalez de Alonso, Carmen, 7-D Univ. Terrace, Columbia, MO 65201
 Gowans, Charles S., Biol. Sci., Univ. of Missouri, Columbia, MO 65211
 Green, Maurice, Molec. Biol., St. Louis. U. Med. Ctr., St. Louis, MO 63103
 Gubbin, Earl J., 700 Sunset St., Iowa City, IA 52240
 Gulick, James David, 249 Columns IV, Columbia, MO 65201
 Hall, Jeffrey C., Dept. of Biol., Brandeis Univ., Waltham, MA 02254
 Hall, Roger, 324 Tucker Hall, Univ. of Missouri, Columbia, MO 65211
 Harris, Dave, Biol. Dept., Pittsburg State Univ., Pittsburg, KS 66762
 Hartman, Philip S., Univ. of Minnesota, St. Paul, MN 55108
 Heitholt, Jim, Dept. of Agronomy, Univ. of Kentucky, Lexington, KY 40546
 Herrick, Carleton S., Dept. of Biol., Univ. of Kansas, Lawrence, KS 66045
 Hills, Richard L., 260 Fine Arts, Univ. of Missouri, Columbia, MO 65211
 Hinshaw, Steve, Dept. of Biol., Washburn Univ., Topeka, KS 66621
 Hough, Dan, Zoology Dept., Univ. of Oklahoma, Norman, OK 73069
 Huckaby, John P., Biol. Dept., Southeast Missouri St., Cape Girardeau, MO 63701
 Hunt, Ken, Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
 Jaeger, Jo, 106 E. Stewart, Columbia, MO 65201
 Johri, M. M., Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
 Jones, Bobby R., 5281 Edenshire, Memphis, TN 38117
 Kagawa, Tak, Dept. of Biochem., Univ. of Missouri, Columbia, MO 65211
 Kang, Manjit S., 257 Center Dr., Caseyville, IL 62232
 Keim, Paul, 411 Snow Hall, Kansas Univ., Lawrence, KS 66045
 Kelley, Phil, Box 8093, Washington U. Med. Sch., St. Louis, MO 63110
 Kerr, Phillip, Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
 Kikudome, Gary Y., 405 Tucker Hall, Univ. of Missouri, Columbia, MO 65211
 Kimber, Gordon, 220 Curtis Hall, Univ. of Missouri, Columbia, MO 65211
 Kimber, Yvonne, 1201 Woodhill Road, Columbia, MO 65201
 Kinscherf, Thomas G., Biol. Dept., Washington Univ., St. Louis, MO 63130
 Kos, Edward S., Dept. of Biol., Rockhurst College, Kansas City, MO 64110
 Kowles, Richard, St. Mary's College, Winona, MN 55987
 Lackey, Steven, 1513 Bouchelle, Columbia, MO 65201
 Lagrimini, 1211 2nd Street #22, Coralville, IA 52241
 Lane, Leslie C., Dept. of Plant Pathol., U. of Nebraska, Lincoln, NE 68583
 Larson, Russell L., 304 Curtis Hall, Univ. of Missouri, Columbia, MO 65211
 Layton, Eric, Dept. of Biol., Washburn Univ., Topeka, KS 66621
 LeFever, H. Michael, Emporia State University, Emporia, KS 66801
 Loeffler, Bobbie, 231 Pierce #2, West Lafayette, IN 47906
 Longwell, John H., Dean Emer., 2-4 Agric., U. of Missouri, Columbia, MO 65211
 Lyons, Rhona, 212 DRC, Columbia, MO 65201

- Magee, A. I., Micro. & Immunol., Wash. U. Med. Sch., St. Louis, MO 63110
 Maruyama, Takeo, National Institute of Genetics, Mishima, 411 Japan
 Maxam, Glynda V., 710 N. Towers, S.E. Missouri St. U., Cape Girardeau, 63701
 McCall, Nancy, Box 122, New Franklin, MO 65274
 McCune, Roy A., 506 High St., Columbia, MO 65201
 Meinke, David, Dept. of Biol., Washington Univ., St. Louis, MO 63130
 Merlo, Donald J., 110 Tucker Hall, Univ. of Missouri, Columbia, MO 65211
 Michaud, Ted C., 1227 Downing Dr., Waukesha, WI 53186
 Miles, Donald, Univ. of Missouri, Columbia, MO 65211
 Miles, Judith, N708 Med. Ctr., Univ. of Missouri, Columbia, MO 65211
 Millikan, D. F., 108 Waters Hall, Univ. of Missouri, Columbia, MO 65211
 Moelmor, Don, Dept. of Anat. & Neurobiol., Wash. Univ., St. Louis, MO 63110
 Mohamed, Aly H., Dept. of Biol., Univ. of Missouri, Kansas City, MO 64110
 Montazer, Ahmad, 1112 Lanore, Urbana, IL 61801
 Morrison, Donald A., Dept. of Biol., Univ. of Ill., Chicago, IL 60680
 Moscatelli, E., Biochem. Dept., Univ. of Missouri, Columbia, MO 65211
 Murray, Elizabeth Ellen, 905 W. 29 St. Terr., Lawrence, KS 66044
 Nelson, Ken, 1211 University Ave., Columbia, MO 65201
 Neuffer, M. G., Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
 Nguyen, Manh Q., 41 University Heights, Columbia, MO 65201
 Park, Chung Uk, 3204 Lynnwood Drive, Columbia, MO 65201
 Parsons, Laura, Dept. of Biol., Berea College, Berea, KY 40404
 Peng, Ching-I, Missouri Botanical Garden, Box 299, St. Louis, MO 63166
 Peterson, Don, 614 Rundell, Iowa City, IA 54240
 Polacco, Joe, 121 Med. Sci., Univ. of Missouri, Columbia, MO 65211
 Polley, David, Dept. of Biol., Wabash College, Crawfordsville, IN 47933
 Porter, John R., 3020 N. 41st, Lincoln, NE 68504
 Proffitt, Randy, 1140 Tennessee, Lawrence, KS 66044
 Radding, Charles M., Molec. Biophys., Yale U. Med. Sch., New Haven, CT 06510
 Rafail, William S., Dept. of Biol., Berea College, Berea, KY 40404
 Reaban, Mary, 1602 Anthony, Columbia, MO 65201
 Reinbolt, Marta, Biol. Dept., Pittsburg St. U., Pittsburg, KS 66762
 Riddle, D. L., Tucker Hall, Univ. of Missouri, Columbia, MO 65211
 Ridings, Sandra L., 1612 N. Henderson, Cape Girardeau, MO 63701
 Riley, Monica, Biochem. Dept., New York State Univ., Stony Brook, NY 11794
 Rivin, Carol, Dept. of Biol., Washington Univ., St. Louis, MO 63130
 Roberts, Scott, 901 Illinois #5, Lawrence, KS 66044
 Rollins, Jeffrey, RR #11, Remers Rd., Columbia, MO 65201
 Samson, Richard, 1425 S. 28th St., Lincoln, NE 68502
 Sanford, Tom, 402B Cramer, Columbia, MO 65201
 Sargent, Malcolm L., Dept. of Genet. & Devel., U. of Ill., Urbana, IL 61801
 Schmidt, Francis, Dept. of Biochem., Univ. of Missouri, Columbia, MO 65211
 Schnee, Fred B., 2172 W. Brooks, Apt. A, Norman, OK 73069
 Schrod, Mary E., 324 Tucker Hall, Univ. of Missouri, Columbia, MO 65211
 Scott, Jamie, 400 Auburn Lane, Columbia, MO 65201
 Sears, Ernie, Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
 Sears, Lotti, Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
 Sehgal, O. P., Dept. of Plant Pathol., Univ. of Missouri, Columbia, MO 65211
 Sensenich, Greg, Columns IV #67, Columbia, MO 65201
 Shulko, Carol A., 612 Sycamore #3, Cape Girardeau, MO 63701
 Skimming, Jeff, 110 E. Stewart, Columbia, MO 65201
 Slater, Jim, Biol. Dept., Crowder College, Neosho, MO 64850
 Smith, George, Tucker Hall, Univ. of Missouri, Columbia, MO 65211
 Stafford, Grace A., 825 A Hatch, Columbia, MO 65211
 Stahl, Franklin W., Molecular Biol., Univ. of Oregon, Eugene, OR 97403
 Stark, William S., Biol. Sci., LeFevre, U. of Missouri, Columbia, MO 65211
 Stock, Carolyn, Rm. 3 Tucker, Univ. of Missouri, Columbia, MO 65211
 Strickberger, Monroe W., 7036 Westmoreland Dr., St. Louis, MO 63130

Swanson, Margaret, 110 Tucker Hall, Univ. of Missouri, Columbia, MO 65211
Swyschuck, Sophia, 825 B Hatch, Columbia, MO 65211
Takakuwa, Susumu, 1503 Anthony St., Apt. 3C, Columbia, MO 65201
Temeyer, Kevin, 1011 Queen Ann Dr., Apt. 18, Columbia, MO 65201
Tollefson, Ann, 217 W. Broadway, Apt. G39, Columbia, MO 65201
Triplett, Eric, Curtis Hall, Univ. of Missouri, Columbia, MO 65211
Turner, Mary Ann, Div. of Biol. Sci., Univ. of Missouri, Columbia, MO 65211
Tuveson, Robert W., Dept. of Genet. & Devel., U. of Ill., Urbana, IL 61801
Van Eerdewegh, Paul, 1051 Rue La Ville Walk, St. Louis, MO 63141
Wall, Judy C., 322 New Chemistry, Univ. of Missouri, Columbia, MO 65211
Wang, Wei Yeh, Dept. of Botany, Univ. of Iowa, Iowa City, IA 52242
Weeks, Stacy, Dept. of Biol., Washburn Univ., Topeka, KS 66621
Whalen, R. H., Biol. Dept., South Dakota State Univ., Brookings, SD 57006
Winkler, Rod, 323A Hatch, Columbia, MO 65201
Winton, Dale, 539B Schurz, Columbia, MO 65201
Wixon, Robert L., Dept. of Biochem., Univ. of Missouri, Columbia, MO 65211
Wolf, Thomas, Dept. of Biol., Washburn Univ., Topeka, KS 66621
Woodworth, Pamela, Biol. Dept., Pittsburg State Univ., Pittsburg, KS 66762
Worstell, Jim, Dept. of Agronomy, Univ. of Missouri, Columbia, MO 65211
Yanders, A. F., 210 Jesse Hall, Univ. of Missouri, Columbia, MO 65211
Zarowitz, Mike, 103 E. Forest, Columbia, MO 65201



The Ernest R. Sears Scholarship Fund

The Ernest R. Sears Scholarship Fund, established by Dean Emeritus John H. Longwell and Mrs. Lorna Longwell, is intended to stimulate research and scholarship in Genetics in the spirit of the contributions of Dr. Sears to science, essential to the development of Agriculture. The dividends of the Fund will be used to support and recognize a graduate student or faculty member for scholarship and research in Genetics.

The Fund is administered by the Sears-Longwell Award Committee. The annual awards are presented at the Stadler Genetics Symposia.

If you would like to join in this expression honoring Dr. Sears, please send your contribution to:

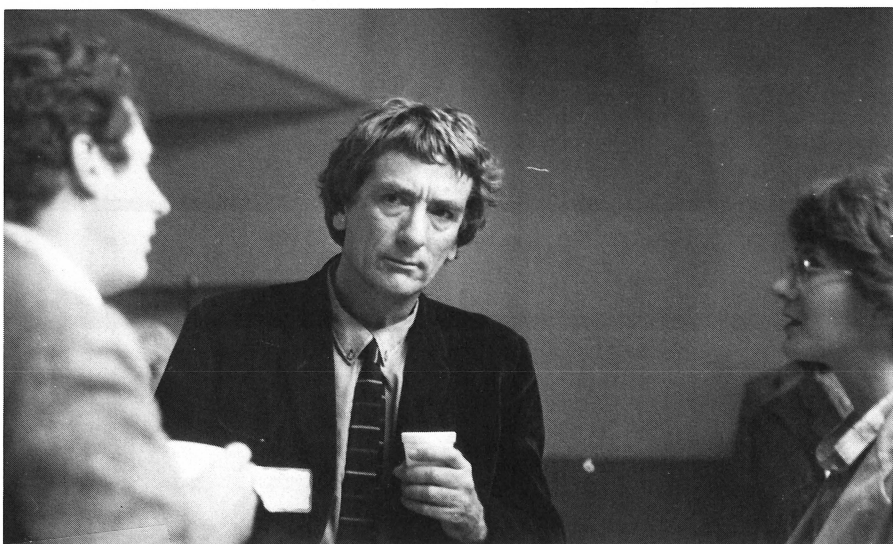
ERNEST R. SEARS FUND
117 Curtis Hall
University of Missouri
Columbia, Missouri 65211

During the year Dr. Sears officially retired, and on that occasion, many generous donations were received from his colleagues, friends, and former students. The alphabetical list below contains only one name from each contributing family.

C. W. Alexander	M. M. Johri	Pioneer Hi-Bred
Raghibir Athwal	P. J. Kaltsikes	International
P. S. Baenziger	E. R. Kerber	Peter H. Raven
Lynn Bates	Gordon Kimber	G. P. Rédei
Jack B. Beckett	Owen J. Koeppel	Louis P. Reitz
Henry E. Bent	K. L. Larson	Herschel L. Roman
R. A. Brink	Ruby I. Larson	Paul Schmidt
Tien-Ding Chang	E. N. Larter	E. R. Sears
Suzanne Chen	G. H. Liang	Dale Sechler
Edward H. Coe, Jr.	Susan W. Liebman	Om P. Sehgal
Donald N. Duvick	W. Q. Loegering	Henry L. Shands
Abraham Eisenstark	C. Edmund Marshall	K. W. Shepherd
L. E. Evans	Melvin H. Marx	Harold H. Smith
Tsu-Ker Fu	Arlene C. Longwell Mazzone	G. Ledyard Stebbins
Melvin D. George	Sheila McCormick	Stanley G. Stephens
D. U. Gerstel	R. McIntosh	Takumi Tsuchiya
Bikram S. Gill	Fred McKinney	K. Tsunewaki
Newell S. Gingrich	Henry A. McQuade	Robert Ullrich
Bernard Goodman	D. F. Millikan	J. Wallin
J. P. Gustafson	Rosalind Morris	James H. Weatherspoon
Roger G. Hanson	Charles F. Mullett	Ralph H. Wetmore
Jack R. Harlan	C. J. Nelson	Norman D. Williams
Luther B. Hughes	Ichizo Nishiyama	Armon F. Yanders
P. D. Jackson	Boyd L. O'Dell	Marcus S. Zuber
C. R. Johnston	Joseph G. O'Mara	



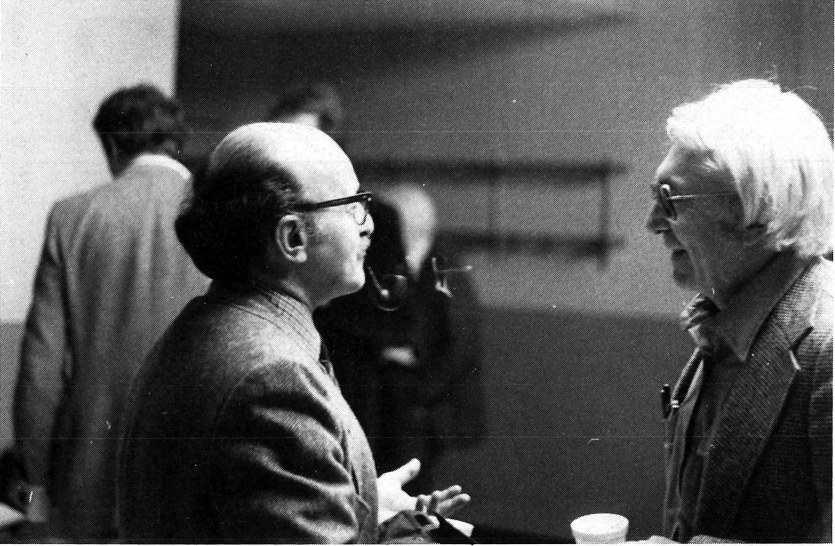
Left to right: Drs. E. R. Sears, Judy D. Wall, Richard Gilmore,
and Gary Kikudome.



Center: Dr. Franklin W. Stahl.



Some of the participants at the 12th Stadler Genetics Symposium (1980), at the Memorial Union, University of Missouri, Columbia.



Foreground: Drs. Monroe W. Strickberger and Maurice Green.



Foreground: Drs. E. R. Sears and Takeo Maruyama.



Back row: Dr. E. R. Sears, Carlos Alonzo-Arnedo (recipient of the 1980 E. R. Sears Scholarship), and Dean Emeritus John H. Longwell. Front row: Mrs. Lorna Longwell and Dr. Lotti Sears.

CONTENTS OF THE PROCEEDINGS

205

VOLUMES 1 AND 2 •1971•

176 pages (\$6.00)

- G. P. RÉDEI: A Portrait of L. J. Stadler 1896-1954
CURT STERN: From Crossing-Over to Developmental Genetics
C. C. LINDEGREN: Biology and Biochemistry: Thesis and Antithesis
T. S. PAINTER: Chromosomes and Genes Viewed from a Perspective
of Fifty Years Research
A. H. DOERMANN: Bacteriophage T₄, the Present Concept of the Gene
A. H. STURTEVANT: On the Choice of Material for Genetical Studies
RUTH SAGER and ZENTA RAMANIS: Formal Genetic Analysis of Organ-
elle Genetic Systems
LYNN MARGULIS: Cytoplasmic Genes - Our Precambrian Legacy
S. FOGEL, D. D. HURST and R. K. MORTIMER: Gene Conversion in Un-
selected Tetrads from Multipoint Crosses
G. W. BEADLE: Genes, Intelligence and Education
W. J. PEACOCK: Cytogenetic Aspects of the Mechanism of Recombina-
tion in Higher Organisms
C. M. RICK: Some Cytogenetic Features of the Genome in Diploid
Plant Species

VOLUME 3 •1971•

116 pages (\$4.00)

- R. W. ALLARD and A. L. KAHLER: Allozyme Polymorphisms in Plant
Populations
DAVID SCHLESSINGER: Repertoire of Genetic Control of Gene Express-
ion in Procarvates
ALLAN R. GOLDBERG and JERARD HURWITZ: The Catalytic Role of rho
in Termination During In Vitro DNA-Dependent RNA Syn-
thesis
HAMPTON L. CARSON: Speciation and the Founder Principle
TIBOR RAJHATHY: The Allopolyploid Model in Avena
JEROME A. SCHIFF: The Informational and Nutritional Requirements
of Cellular Organelles

VOLUME 4 •1972•

136 pages (\$4.00)

- HERMAN W. LEWIS: Trends in Genetics Research - Prospects for De-
velopment
E. R. SEARS: Chromosome Engineering in Wheat
ROBERT P. WAGNER: Evolution and Genetic Significance of Mito-
chondria
STEPHEN H. HOWELL: The Biochemistry of Meiosis and Genetic Re-
combination
G. F. SPRAGUE: The Genetics of Corn Breeding
LEON S. DURE III and WILLIAM C. MERRICK: The Role of tRNA in
Development
SHELDON C. REED and V. ELVING ANDERSON: Genetics of Psychoses
CHARLES F. MULLETT: Seven (or Twenty-Seven) Against Obscurity or
Still Further Observations on Tittlebats

VOLUME 5 •1973•

188 pages (\$4.00)

- M. M. RHOADES: A Portrait of E. G. Anderson 1891-1973
ELOF A. CARLSON: Eugenics Revisited: The Case for Gerninal Choice
H. ROMAN: Studies of Recombination in Yeast
A. EISENSTARK: Tryptophan Photoproduct as a Genetic Probe: Effects on Bacteria
R. P. LEVINE: Membranes and Mutations in *Chlamydomonas reinhardtii*
LEE HOOD: The Genetics, Evolution and Expression of Antibody Molecules
R. D. HOTCHKISS: Genetic Unity and Biochemical Diversity in Genetic Recombination Mechanisms
A. TOMASZ: DNA Uptake by Bacteria and Eucaryotic Cells
R. H. HODGES: Judges, Genes and Man

VOLUME 6 •1974•

168 pages (\$4.50)

- G. UNGAR: Molecular Coding of Information in the Nervous System
O. W. MCBRIDE: Metaphase Chromosome Uptake by Mammalian Cells and Expression of the Genes Transferred
T. T. PUCK: The Genetics of Somatic Mammalian Cells
R. H. DAVIS: Metabolic Organization in Neurospora
P. S. CARLSON and T. B. RICE: Developmental Genetics and Crop Yield
B. A. HAMKALO, O. L. MILLER, JR. and A. H. BAKKEN: Electron-microscopic Studies of Active Genes
C. S. GOWANS: Genetics and Art
G. P. REDEI, G. ACEDO and G. GAVAZZI: Flower Differentiation in Arabidopsis

VOLUME 7 •1975•

168 pages (\$5.00)

- ERWIN CHARGAFF: A Few Remarks on the Impact of Biochemistry on Genetics
ROBERT B. HELLING: Eukaryotic Genes in Prokaryotic Cells
OLUF L. GAMBORG: Advances in Somatic Cell Hybridization in Higher Plants
RICHARD B. FLAVELL and DEREK B. SMITH: Genome Organization in Higher Plants
NOBORU SUEOKA: Genetic Transformation as a Tool in the Studies of DNA Replication and Recombination
GEORGE B. JOHNSON: Enzyme Polymorphism and Adaptation
ALLAN C. WILSON: Evolutionary Importance of Gene Regulation
C. DONALD MILES: Genetic Analysis of Photosynthesis
DEAN E. METTER: Natural Selection and Adaptive Resemblance

VOLUME 8 •1976•

182 pages (\$5.00)

- DREW SCHWARTZ: Regulation of the Alcohol Dehydrogenase Genes in Maize

- JOHN W. DRAKE: Mutagenic Mechanisms in Bacteriophage T4
ARNOLD L. DEMAIN: Genetic Regulation of Fermentation Organisms
O. P. SEHGAL and C. H. HSU: RNA:Protein and Protein:Protein Interactions in the Virions of Southern Bean Mosaic Virus
JAMES E. CARREL: Aphrodisiacs and Anaphrodisiacs: Better Loving Through Chemistry
ALFRED R. LOEBLICH III: Dinoflagellate Genetics and DNA Characterization
DAVID APIRION: Genetic Approaches to the Study of Ribosomes
DAVID E. PETTIJOHN: DNA Packaging in Isolated Bacterial Nucleoids
ANTHONY CERAMI: The Development of New Drugs for Genetic Diseases

VOLUME 9 •1977•

218 pages (\$5.00)

- JAMES W. ALLEN, CHARLES F. SHULER and SAMUEL A. LATT: Extension of BrdU-Dye Analysis of DNA Replication and Sister Chromatid Exchange Formation to In Vivo Systems
G. GAVAZZI: The Genetic Complexity of the R Locus in Maize
JAMES N. THOMPSON, JR.: Analysis of Gene Number and Development in Polygenic Systems
HIROFUMI UCHIMIYA, KEVIN CHEN and S. G. WILDMAN: Polypeptide Composition of Fraction I Protein as an Aid in the Study of Plant Evolution
DONALD L. RIDDLE: A Genetic Pathway for Dauer Larva Formation in *Caenorhabditis elegans*
WINSTON J. BRILL: Genetics of Nitrogen Fixation
RUTH KAVENOFF and BRIAN C. BOWEN: On the Organization of DNA in Isolated Bacterial Chromosomes
J. R. S. FINCHAM: A Gene-Enzyme Relationship in *Neurospora*
GARY STEIN, JANET STEIN, LEWIS KLEINSMITH, WILLIAM PARK, JUDITH THOMSON, ROBERT JANSING, ELIZABETH SHEPHARD and SIEGFRIED DETKE: Chromatin as a Model System for Studying the Regulation of Histone Gene Expression in Mammalian Cells
MOSHE FELDMAN: Historical Aspects and Significance of the Discovery of Wild Wheats

VOLUME 10 •1978•

124 pages (\$5.00)

- ARTHUR CHOVNICK, MARGARET MCCARRON, ARTHUR HILLIKER, JANIS O'DONNELL, WILLIAM GELBART and STEPHEN CLARK: Organization of a Gene in *Drosophila*: A Progress Report
BARBARA MCCLINTOCK: Mechanisms that Rapidly Reorganize the Genome
NORMAN H. GILES, N. K. ALTON, M. E. CASE, J. A. HAUTALA, J. W. JACOBSON, S. R. KUSHNER, V. B. PATEL, W. R. REINERT, P. STRÖMAN and D. VAPNEK: The Organization of the QA Gene Cluster in *Neurospora crassa* and its Expression in *Escherichia coli*
JANINE ZIEG, MICHAEL SILVERMAN, MARCIA HILMEN and MELVIN SIMON: Phase Variation in *Salmonella*: Analysis of the Controlling Element of H2 Gene Expression
C. S. LEVINGS III and D. R. PRING: The Mitochondrial Genome of Higher Plants

M. M. GREEN: The Genetic Control of Mutation in *Drosophila*
GEORGE P. SMITH: Non-Darwinian Evolution and the Beard of Life

VOLUME 11 •1979•

184 pages (\$6.00)

- GARY E. HART: Genetical and Chromosomal Relationships Among the Wheats and Their Relatives
GISELA MOSIG, RICHARD DANNENBERG, DEBABROTA GHOSAL, ANDREAS LUDER, STEPHEN BENEDICT and SUSAN BOCK: General Genetic Recombination in Bacteriophage T4
ACHILLES DUGAICZYK, SAVIO L. C. WOO and BERT W. O'MALLEY: Molecular Structure of the Ovalbumin Gene and its Genotypic Alleles
DONALD J. MERLO: Ti Plasmids of *Agrobacterium*: Potentials for Genetic Engineering
RUDOLF HAGEMANN: Genetics and Molecular Biology of Plastids of Higher Plants
JAMES A. GAVAN: Fossils, Apes, Man, and Culture
WINONA C. BARKER and MARGARET DAYHOFF: Role of Gene Duplication in the Evolution of Complex Physiological Mechanisms: An Assessment Based on Protein Sequence Data
DAVID D. PERKINS: *Neurospora* as an Object for Cytogenetic Research
KEVIN MCENTEE and GEORGE WEINSTOCK: The RecA Protein of *E. coli*: Regulation and Function in Recombination and Repair

VOLUME 12 •1980•

208 pages (\$7.00)

- MONICA RILEY: Evolution of the Bacterial Genome
JUDITH H. MILES: Medical Genetics: Impact and Strategy
JEFFREY C. HALL, RICHARD W. SIEGEL, LAURIE TOMPKINS and C. P. KYRIACOU: Neurogenetics of Courtship in *Drosophila*
TAKEO MARUYAMA and EIICHI SOEDA: Molecular Evolution in Papova Viruses and Their Host Species, and in Bacteriophages
CHARLES M. RADDING, CHANCHAL DAS GUPTA, TAKEHIKO SHIBATA and RICHARD P. CUNNINGHAM: The Topology of Homologous Pairing
JUDY D. WALL: Nitrogen Fixation by Photosynthetic Bacteria
T. O. DIENER: Viroids: Minimal Genetic Systems
G. NIGEL GODSON: Evolution of DNA Sequence: Mechanisms and Models as Seen in Small Phages
MAURICE GREEN, WILLIAM S. M. WOLD, KARL H. BRACKMANN, TAKUMI MATSUO, SHUICHI HASHIMOTO and JANEY SYMINGTON: The Integration and Expression of Human DNA Tumor Virus Genes

THE VOLUMES OF THESE SYMPOSIA CAN BE ORDERED FROM 117 CURTIS HALL, UNIVERSITY OF MISSOURI, COLUMBIA, MISSOURI 65211. EACH ORDER MUST INCLUDE AN ADDITIONAL 75¢ FOR POSTAGE AND HANDLING. MISSOURI RESIDENTS ARE REQUIRED TO PAY 4% SALES TAX. MAKE CHECKS PAYABLE TO STADLER GENETICS SYMPOSIA.

