

AMERICAN SOCIETY OF ZOOLOGISTS

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* Unless a specific date is mentioned, terms of office end following the annual three-day meeting of the Society.

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PROGRAM
FOR THE FIFTY-FOURTH ANNUAL MEETING
OF THE
AMERICAN SOCIETY OF ZOOLOGISTS

AUGUST 26, 27, 28, 29, 1957

The American Society of Zoologists will hold its annual meeting at Stanford University in Palo Alto in conjunction with the American Institute of Biological Sciences.

The program represents perhaps the richest offering ever presented to members of the Society. The number of special features which the Society is either sponsoring or co-sponsoring is unusually high; and the number of contributed papers is about fifty per cent greater than at Storrs last year.

SPECIAL SCIENTIFIC PROGRAMS

1. A two-day symposium on "The Origins and Affinities of the Land and Freshwater Fauna of Western North America" (August 26, 27).
2. A morning Round Table on "Ultrastructure of Protozoa" (August 27).
3. An afternoon special session on endocrinology (August 27).
4. An all day Symposium on "Metabolic Aspects of Embryonic Differentiation" (August 29).

SPECIAL GENERAL PROGRAMS

1. A three-session Refresher Course, "Recent Advances in the Study of Animal Behavior" (August 28).
2. An evening discussion on "Experiments in Preparing Graduate Students in College Teaching" (August 27).

CONVENTIONAL FEATURES

1. Annual Dinner, featured by the Presidential Address (August 28).
2. Business Meeting. It is essential that members attend and contribute to the discussion, because this will be devoted largely to a report by the Policy Committee, now headed by Dr. Hubert Goodrich (August 27).
3. There are sixteen sections of contributed papers:
 - Animal Behavior and Sociobiology (2 sections)
 - Embryology
 - Chemical embryology
 - Embryology and developmental genetics
 - Physiology
 - Arthropod physiology
 - Experimental biology and physiology
 - Endocrinology (3 sections)
 - Protozoology
 - Radiation Biology
 - Cytology and Histology (2 sections)
 - Demonstrations (three sessions)

OTHER FEATURES

We would call to the attention of our members two other features which will be of interest: the symposium arranged by the American Society of Naturalists; and the symposium on Radiation Biology arranged by the Western Naturalists and the Society of General Physiologists.

LIST OF TITLES

Titles are arranged in the same order as in the program shown on the previous page. The titles for the demonstrations follow those of papers to be read. Papers to be read by title are listed last.

MONDAY MORNING SESSION, AUGUST 26TH

Symposium: The Origins and Affinities of the Land and Freshwater Fauna of Western North America. (In collaboration with the Western Society of Naturalists and the Society of Systematic Zoology) (Five sessions)

First Session, *General Background*

Memorial Auditorium — 9:00 A.M.

CARL L. HUBBS, presiding

- P. B. KING, U.S. Geological Survey. The geological background: evolution of modern surface features of western North America.
- H. D. MACGINTIE, Humboldt State College. Tertiary climates of North America.
- G. A. BARTHOLOMEW, University of California at Los Angeles. The role of physiology in the distribution of terrestrial vertebrates.

MONDAY AFTERNOON SESSION, AUGUST 26TH

Symposium: The Origins and Affinities of the Land and Freshwater Fauna of Western North America, continued.

Second Session, *Warm Blooded Vertebrates*

Memorial Auditorium — 2:00 P.M.

CARL L. HUBBS, presiding

- D. E. SAVAGE, University of California at Berkeley. Origins and affinities of western nearctic land mammals, the paleontological record.
- W. H. BURT, University of Michigan. Present distribution patterns and relationships of the mammalian fauna of western North America.
- A. H. MILLER, University of California at Berkeley. Birds (no title available).
- H. A. TORDOFF, University of Kansas. Birds (no title available).

TUESDAY MORNING SESSION, AUGUST 27TH

Symposium: The Origin and Affinities of the Land and Freshwater Fauna of Western North America, continued.

Third session, *Cold-blooded Vertebrates and Aquatic Invertebrates*

Memorial Auditorium — 9:00 A.M.

KARL P. SCHMIDT, presiding

- R. C. STEBBINS, University of California at Berkeley. Origins and affinities of the present western North American reptile and amphibian fauna.
- F. C. PEABODY, University of California at Los Angeles. Fossil trackways of salamanders. An unexpected contribution of paleontology to the history of western urodeles.
- R. R. MILLER, University of Michigan. Fresh water fishes of North America.
- R. W. PENNAK, University of Colorado. Some problems of freshwater invertebrate distribution in the western states.

TUESDAY MORNING SESSION, AUGUST 27TH

Round Table: Ultrastructure of Protozoa (In collaboration with the Society of Protozoologists)

9:00 A.M.

Room 122 — Outer Quadrangle

Moderator, HAROLD W. BEAMS, State University of Iowa

- EVERETT ANDERSON, University of Colorado. Further observations on the fine structure of *Trichomonas*.
- MARIA A. RUDZINSKA, Rockefeller Institute for Medical Research. Mechanisms involved in the function of the contractile vacuole in *Tokophya infusionum* as revealed by electron microscopy.
- L. EVANS ROTH, Argonne National Laboratory. Cilia and accessory structures in the Protozoa.
- DOROTHY R. PITELKA AND CHARLES B. METZ, University of California at Berkeley and Florida State University. The ciliary apparatus.
- CHARLES F. EHRET AND E. L. POWERS, Argonne National Laboratory. The organelles of *Paramecium*.
- RUTH V. DIPPPELL AND KEITH R. PORTER, Indiana University and the Rockefeller Institute for Medical Research. The fine structure of the *Paramecium* macronucleus.

TUESDAY MORNING SESSION, AUGUST 27THSection A. *Animal Behavior and Sociobiology*: 9:00 A.M.

(In collaboration with the Ecological Society of America)

Room 430, Outer Quadrangle

MARTIN W. SCHEIN, presiding

- 9:00 a.m. 1. Sexual behavior of the desert pupfish *Cyprinodon macularius* Baird and Girard. George W. Barlow, University of California, Los Angeles. (15 min.)
- 9:20 a.m. 2. Nesting behavior of the Siamese fighting fish, *Betta splendens*. James Braddock and Zora Braddock, Michigan State University. (15 min.)
- 9:40 a.m. 3. Sexual behavior of male platyfish reared in altered environments. Evelyn Shaw, American Museum of Natural History. (15 min.)
- 10:00 a.m. 4. Aggressive behavior in castrated starlings. David E. Davis, Johns Hopkins University. (10 min.)
- 10:20 a.m. 5. The head as a stimulus for orientation and arousal of sexual behavior of male turkeys. M. W. Schein and E. B. Hale, Pennsylvania State University. (15 min.)
- 10:40 a.m. 6. Mating behavior of the Boat-tailed Grackle. Robert K. Selander, University of Texas. (15 min.)
- 11:00 a.m. 7. Sexual behavior and physiology cycle in an annual breeding wild rodent. R. H. Denniston, II, University of Wyoming. (15 min.)
- 11:20 a.m. 8. A study of group dynamics in moose during the rutting season. Margaret Altmann, Jackson Hole Biological Research Station. (15 min.)
- 11:40 a.m. 9. Executive and releaser organs of vertebrate social behavior. Miklos D. F. Udvardy, University of British Columbia. (Introduced by Wilbert A. Clemens) (15 min.)

TUESDAY MORNING SESSION, AUGUST 27THSection B. *Embryology and Developmental Genetics*: 9:00 A.M.

Room 121, Outer Quadrangle

EMIL WITSCHI, presiding

- 9:00 a.m. 10. The uptake of radioactive calcium by sea urchin eggs. Sidney C. Hsiao and Howard Boroughs, University of Hawaii. (15 min.)
- 9:20 a.m. 11. Maintenance of gonads of frog larvae on chemically defined media. Charles L. Foote, George T. Crouse and Florence M. Foote, Southern Illinois University. (15 min.)

- 9:40 a.m. 12. Sex chromatin and sex differentiation in human embryos. Emil Witschi, State University of Iowa. (15 min.)
- 10:00 a.m. 13. Interaction between two allelic series modifying primordial germ cell development in the mouse embryo. Beatrice Mintz, University of Chicago. (15 min.)
- 10:20 a.m. 14. The cytology of the irradiated ovary of *Drosophila melanogaster*. R. C. King, Northwestern University. (15 min.)
- 10:40 a.m. 15. Induced polyploid species hybrids in California *Taricha*. William Brandom, Stanford University. (Introduced by Victor Twitty) (10 min.)
- 11:00 a.m. 16. Application of agar-diffusion techniques to the analysis of *Drosophila* antigens. Allen S. Fox and Sei-Byung Yoon, Michigan State University. (15 min.)
- 11:20 a.m. 17. Effect of various compounds in the diet on the incidence of an inherited tumor. Herbert I. Stein and Taylor Hinton, University of California, Los Angeles. (15 min.)

TUESDAY MORNING SESSION, AUGUST 27TH

Section C. *Arthropod Physiology*:

Room 123, Outer Quadrangle

CARROLL WILLIAMS, presiding

- 9:00 a.m. 18. Experiments on the permeability of the testicular envelope of *Samia walkeri*. Richard S. Sanborn, Purdue University. (15 min.)
- 9:20 a.m. 19. Investigation of possible antagonism between host and symbiote. Marion A. Brooks, University of Minnesota. (15 min.)
- 9:40 a.m. 20. Oxygen poisoning in *Habrobracon juglandis*. A. M. Clark and M. J. Papa, University of Delaware. (15 min.)
- 10:00 a.m. 21. The juvenile hormone of insects. Carroll M. Williams, Harvard University. (15 min.)
- 10:20 a.m. 22. Background adaptation in the dwarf crayfish, *Cambarellus shufeldti*. Milton Fingerman and Mildred E. Lowe, Tulane University. (15 min.)
- 10:40 a.m. 23. Additional studies on responses to light by cave crayfishes. Patrick H. Wells, Occidental College. (15 min.)
- 11:00 a.m. 24. A comparative electrophysiological analysis of chemoreceptors in arthropods. Edward S. Hodgson, Columbia University. (15 min.)
- 11:20 a.m. 25. The fine structure of insect peripheral nerves and neuro-muscular junctions. George A. Edwards, New York State Department of Health. (15 min.)
- 11:40 a.m. 26. Pteridines in the milkweed bug, *Oncopeltus fasciatus* (Dallas). Bruce Hudson and Roderick Craig, University of California, Berkeley. (10 min.)

TUESDAY AFTERNOON SESSION, AUGUST 27THSection P. *Demonstrations*

Rooms 429A and 429B, Outer Quadrangle

1:00 – 2:00 P.M. For description of demonstrations see listing following the papers to be read (page 506).

Symposium: The Origin and Affinities of the Land and Freshwater Fauna of Western North America, continued.

Fourth Session, *Insects*

Memorial Auditorium — 2:00 P.M.

- H. H. ROSS, Illinois Natural History Survey. Some elements of northern and montane insect fauna.
- J. A. G. REHN, Academy of Natural Science, Philadelphia. The origins and affinities of Dermaptera and Orthoptera of western North America.
- E. G. LINSLEY, University of California at Berkeley. The origins and affinities of the Cerambycid fauna of western North America.
- W. HOVANITZ, California Institute of Technology. Significant phenomena indicating origins and affinities of the north American butterfly fauna.

Section D. *Animal Behavior and Sociobiology: 2:00 P.M.*

Room 122, Outer Quadrangle

DAVID E. DAVIES, presiding

- 2:00 p.m. 27. Habituation of the roach to puffs of air. Charles Baxter, University of California, Los Angeles. (10 min.)
- 2:15 p.m. 28. Density and dispersal in laboratory crayfish populations. Richard V. Bovbjerg, University of Iowa. (10 min.)
- 2:30 p.m. 29. Observations on the behavior of the Oklahoma lizards *Sceloporus* and *Cnemidophorus*. Charles C. Carpenter, University of Oklahoma. (10 min.)
- 2:45 p.m. 30. Footedness in domestic pigeons. Harvey I. Fisher, Southern Illinois University. (10 min.)
- 3:00 p.m. 31. An analysis of auditory behavior in young *Anatidae*. Peter H. Klopfer, Yale University. (10 min.)
- 3:15 p.m. 32. Behavior elicited by brain stimulation in freely moving vertebrates. F. Strumwasser and T. J. Cade, University of California, Los Angeles. (10 min.)

- 3:30 p.m. 33. The development of vernal migratory behavior in caged individuals of several taxa of *Zonotrichia*. Donald S. Farner, State College of Washington. (15 min.)
- 3:50 p.m. 34. Effects of social experience in the laboratory upon the adaptation of *Peromyscus* to a natural environment. John A. King and Basil E. Eleftheriou, R. B. Jackson Memorial Laboratory, Bar Harbor, Maine. (15 min.)

Section E. *Endocrinology*

Special Session in Honor of Professor Bennet Mills Allen on his Eightieth Birthday: 1:30 P.M.

(In collaboration with the Western Society of Naturalists)

Room 121, Outer Quadrangle

AUBREY GORBMAN, Chairman

- 1:30 p.m. 35. Some current aspects of comparative thyroid physiology. Aubrey Gorbman, Columbia University.
- 2:05 p.m. 36. Differences in susceptibility to ionizing irradiation observed in non-dividing cells of anurans. Bennet M. Allen, University of California, Los Angeles.
- 2:25 p.m. 37. The mode of action of thyroid hormone. Allen Lein, Northwestern University School of Medicine.
- 2:45 p.m. 38. The thyroid gland in the development of the embryonic chick. John W. McMenamin, Occidental College.
- 3:05 p.m. 39. Studies on the carbohydrate metabolism of the salamander, *Taricha torosa*. Malcolm R. Miller, Stanford University School of Medicine.
- 3:25 p.m. 40. Studies on pineal function in lizards. Robert C. Stebbins, University of California, Berkeley.
- 3:45 p.m. 41. Visualization of the response of endocrine tissues under various experimental conditions by intraocular transplantation technique. Elly M. Jacobsen, U. S. Naval Radiological Defense Laboratory.
- 4:05 p.m. 42. The estrogen-adrenal relationship in mice. Howard A. Bern, University of California, Berkeley.
- 4:25 p.m. 43. Examples of competitive and non-competitive interaction of steroid hormones *in vitro*. Clara M. Szego, University of California, Los Angeles.

Section F. *Embryology*: 2:00 P.M.

Room 123, Outer Quadrangle

OSCAR E. SCHOTTÉ, presiding

- 2:00 p.m. 44. Normal growth and differentiation of hamster pouch epithelium. Roy Gillette, University of Illinois. (15 min.)
- 2:20 p.m. 45. Terminal growth in the hydroid *Campanularia*. Sears Crowell and Charles Wytttenbach, Indiana University. (10 min.)
- 2:35 p.m. 46. Self-differentiation of the components of the pituitary complex in frog embryos. William Etkin, Albert Einstein College of Medicine. (15 min.)
- 2:55 p.m. 47. The influence of the eyeball upon the development of the eyelid, conjunctiva, and tear glands in the frog. Jerry J. Kollros and Clifton G. Schroeder, State University of Iowa. (12 min.)
- 3:12 p.m. 48. An analysis of the acetylcholine content of the regenerating forelimb of the newt, *Triturus*. Marcus Singer, Cornell University. (15 min.)
- 3:32 p.m. 49. The quantitative relationship of nerves to the loss of regenerative capacity in developing hind limbs of *Bana sylvatica*. James M. Van Stone, Trinity College. (15 min.)
- 3:52 p.m. 50. Influence of Amphenone B—a cortical inhibitor—upon regeneration in normal and in hypophysectomized newts. Oscar E. Schotté and Willard B. Christiansen, Amherst College. (10 min.)
- 4:07 p.m. 51. Description of stages of regeneration in adult frogs. Oscar E. Schotté, Amherst College. (5 min.)

Section P. *Demonstrations*

Rooms 429A and 429B, Outer Quadrangle

4:00—6:00 P.M. For description of demonstrations see listing following the papers to be read (page 506).

TUESDAY EVENING SESSION, AUGUST 27TH

Annual Business Meeting. 7:00 P.M.

Room 121, Outer Quadrangle

ELMER G. BUTLER, presiding

A large part of the meeting will be devoted to a report of the Policy Committee. It is hoped that there will be a large attendance by members, and free participation in the discussion.

TUESDAY EVENING SESSION, AUGUST 27TH*Round Table: Experiments in Preparing Graduate Students in College Teaching.*

Arranged by Thomas H. Hall. 8:00 P.M.

Room 121, Outer Quadrangle

THOMAS H. HALL, Moderator

BENSON GINSBURG, University of Chicago

WILLIS H. JOHNSON, Wabash College

LINCOLN CONSTANCE, University of California

TUESDAY EVENING SESSION, AUGUST 27TH*Symposium: The Origin and Affinities of the Land and Freshwater Fauna of Western North America.*Fifth Session: *Panel Discussion.* 8:00 P.M.

Memorial Auditorium

C. L. HUBBS, *presiding*

W. H. BURT, University of Michigan

A. H. MILLER, University of California at Berkeley

H. H. ROSS, Illinois Natural History Survey

R. W. PENNAK, University of Colorado

WEDNESDAY MORNING SESSION, AUGUST 28TH*Refresher Course: Recent Advances in the Study of Animal Behavior.**First Session.*

(In collaboration with the Behavior Section of the Ecological Society of America, the Western Society of Naturalists and the National Association of Biology Teachers; supported by a grant from the National Science Foundation; arranged by George A. Bartholomew, University of California at Los Angeles.) (Three Sessions.)

Dinkelspiel Auditorium

ELMER G. BUTLER, *presiding*

9:00 A.M.

J. P. SCOTT, Jackson Memorial Laboratory. Genetics and behavior.

G. BAERENDS, University of Groningen. Ethnology.

M. MIDDLESTAEDT, University of Wilhelmshaven. Control systems in behavior with emphasis on insects and lower forms.

Section G. *Protozoology*: 9:00 A.M.

Room 430, Outer Quadrangle

THEODORE L. JAHN, presiding

- 9:00 a.m. 52. The biology of an apogamic miliolid foraminifer. Zach M. Arnold, University of California, Berkeley. (10 min.)
- 9:15 a.m. 53. Feeding mechanisms in the suctorian genus *Ephelota*. Robert W. Hull, Northwestern University. (15 min.)
- 9:35 a.m. 54. Some observations on the morphology of dysterian ciliates as seen in *Dysteria* from the Gulf of Mexico. Eugene C. Bovee, University of Florida. (15 min.)
- 9:55 a.m. 55. Application of the "Copenhagen Decisions" to nomenclatural problems involving the higher taxa of ciliated protozoa. John O. Corliss, University of Illinois. (15 min.)
- 10:10 a.m. 56. Nicarbazin in the treatment of experimental infections with *Eimeria bovis* in calves. Datus M. Hammond, Clyde M. Senger, Joseph L. Thorne, J. LeGrande Shupe, Paul R. Fitzgerald and A. Earl Johnson, Utah State University and Animal Disease and Parasite Research Division, ARS, USDA. (10 min.)
- 10:30 a.m. 57. Hybrid vigor in *Paramecium aurelia*. R. W. Siegel, University of California, Los Angeles. (15 min.)
- 10:50 a.m. 58. Multiplication rate of *Tetrahymena geleii* HS under optimal culture conditions. David M. Prescott, University of California, Los Angeles. (15 min.)
- 11:10 a.m. 59. New types of vitamin B₁₂-functioning materials found in Protozoa. Fred Sanders and Gerald R. Seaman, University of Texas Medical Branch. (15 min.)
- 11:30 a.m. 60. Thermophily in ciliated protozoa. George G. Holz, Jr., Syracuse University. (15 min.)

Section H. *Physiology*: 9:00 A.M.

Room 122, Outer Quadrangle

ARTHUR W. MARTIN, presiding

- 9:00 a.m. 61. Studies in vivo of the contractile behavior of the tubules of the epididymis. Paul L. Risley and Charles Turbyfill, University of Oregon. (15 min.; Motion picture.)
- 9:20 a.m. 62. Wheat germ oil and reproduction in the golden hamster, *Mesocricetus auratus*. Helen Oman and Hulda Magalhaes, Bucknell University. (15 min.)
- 9:40 a.m. 63. The influence of biotin on reproduction in the white rat. William A. Cooper and Sidney O. Brown, A. and M. College of Texas. (10 min.)

- 9:55 a.m. 64. Tissue regeneration in albino rats fed diets deficient in certain vitamins. Sidney O. Brown, A. and M. College of Texas. (10 min.)
- 10:10 a.m. 65. Application of weight-specific oxygen consumption measurements to the determination of circulation rates in *Octopus hongkongensis*. D. D. Chapman and A. W. Martin, University of Washington. (15 min.)
- 10:30 a.m. 66. The folic acid requirement and its antagonism by aminopterin in the nematode *Caenorhabditis briggsae* (Rhabditidae). Ellsworth C. Dougherty and Eder Lindsay Hansen, University of California, Berkeley. (15 min.)
- 10:50 a.m. 67. Effect of repeated alcohol administration on several enzyme activities in the rat. F. W. Kinard and M. G. Hay, Medical College of South Carolina. (10 min.)
- 11:05 a.m. 68. Cholinesterase activities in marine nemerteans. Fred I. Kameoto and Stephen R. Geiger, Dugway, Utah and University of Illinois. (10 min.)
- 11:20 a.m. 69. A possible blue-absorbing visual pigment in the gecko, *Oedura monilis*. Frederick Crescitelli, University of California, Los Angeles. (15 min.)
- 11:40 a.m. 70. The visual pigments of amphibians. James C. Peskin, University of Rochester. (15 min.)
- 11:55 a.m. 71. The amino acids of *Rana pipiens* visual purple. James C. Peskin and Richard L. Potter, University of Rochester. (15 min.)

Section I. *Endocrinology*: 9:00 A.M.

Room 123, Outer Quadrangle

PAUL A. WRIGHT, presiding

- 9:00 a.m. 72. Direct action of thyroxine analogues on peripheral tissues of anuran larvae. Jane Couffer Kaltenbach, Northwestern University. (15 min.)
- 9:20 a.m. 73. Effect of thyroxine and estradiol on the serum calcium, phosphorus, and protein of goldfish. Robert E. Bailey, University of Tennessee Medical Units. (Introduced by H. H. Wilcox) (15 min.)
- 9:40 a.m. 74. The effect of thyroidectomy and thyroxine treatment on the oxidative metabolism of the lizard, *Anolis carolinensis*. Michael J. Maher and Blaine H. Levedahl, University of California, Los Angeles. (Introduced by Waldo H. Furgason) (10 min.)
- 10:07 a.m. 75. Seasonal variations in the mule deer thyroid. Ludvig G. Browman, Montana State University. (12 min.)

- 10:25 a.m. 76. Failure of castrated mice to show an increase in concentration of gonadotropin in the pituitary gland. Meredith N. Runner and Margaret M. Dickie, Roscoe B. Jackson Memorial Laboratory. (15 min.)
- 10:45 a.m. 77. Some endocrine changes in exercised cholesterol-fed capons treated with androgen. Harry Y. C. Wong, Abbie Wong and Frank Johnson, Howard University College of Medicine and Department of Histo-Chemistry, Armed Forces Institute of Pathology, Washington, D. C. (15 min.)

Section P. *Demonstrations*

Rooms 429A and 429B, Outer Quadrangle

11:00 A.M to 12:30 P.M. For description of demonstrations see listing following the papers to be read (page 506).

WEDNESDAY AFTERNOON SESSION, AUGUST 28TH*Refresher Course: Recent Advances in the Study of Animal Behavior.**Second Session. 1:30 P.M.*

Room 122, Outer Quadrangle

GEORGE A. BARTHOLOMEW, presiding

D. E. DAVIS, Johns Hopkins University. The role of behavior in ecology and population dynamics.

A. HASLER, University of Wisconsin. Animal navigation.

H. W. NISSEN, Yerkes Primate Laboratories. Behavior of Primates.

Section J. *Endocrinology: 2:00 P.M.*

Room 123, Outer Quadrangle

MEREDITH N. RUNNER, presiding

- 2:00 p.m. 81. Adrenalectomy on trauma induced decrease in mouse liver non-protein sulfhydryl. Lyle V. Beck and Virginia D. Rieck, University of Pittsburgh School of Medicine. (15 min.)
- 2:20 p.m. 82. Stress-induced increase in plasma ascorbic acid independent of pituitary-adrenal function. Margaret A. Slusher and Sidney Roberts, School of Medicine, University of California, Los Angeles. (Introduced by C. H. Sawyer) (15 min.)

- 2:40 p.m. 83. The survival of spleen-grafted placental tissue in intact and adrenalectomized rats. S. G. Stolpe and J. Yochim, University of Illinois. (10 min.)
- 2:55 p.m. 84. Androgenic effects of adrenal grafts on the accessory reproductive glands of male rats. Dorothy Price and Dwight J. Ingle, University of Chicago. (15 min.)
- 3:15 p.m. 85. Effects of adrenal steroids on electrolyte and water balance in force-fed adrenalectomized rats. R. T. Houlihan and W. J. Eversole, University of New Mexico. (10 min.)
- 3:30 p.m. 86. Steroid diabetes in chickens. Paul Foley Nace and Pauline S. Cookson, McMaster University. (10 min.)
- 3:45 p.m. 87. Further studies on blood glucose in the frog, *Rana catesbiana*. Paul A. Wright, University of Michigan. (15 min.)
- 4:05 p.m. 88. The effects of pituitary autografts on sebaceous glands in the rat. William P. Callahan, University of Texas Medical Branch. (Introduced by Edward G. Rennels) (15 min.)
- 4:25 p.m. 89. The action of melanocyte stimulating hormone (MSH) on isolated frog skin in relation to osmotic pressure and sodium concentration. Ronald R. Novales, University of California, Berkeley. (Introduced by Howard A. Bern) (15 min.)
- 4:45 p.m. 90. The effect of the chromatophorotropic hormone on the pigments of anuran skin. Joseph T. Bagnara and Saul Neidleman, University of Arizona. (Introduced by C. Y. Chang) (15 min.)

Section K. *Chemical Embryology*: 2:00 P.M.

Room 334, Outer Quadrangle

A. M. SCHECHTMAN, presiding

- 2:00 p.m. 91. The effect of various agents on the fertilizability of frog gametes. Stephanie H. Barch and J. R. Shaver, Michigan State University. (15 min.)
- 2:20 p.m. 92. The passage of macromolecules during induction of the nervous system in the frog embryo. Donald E. Rounds and Reed A. Flickinger, University of California, Los Angeles. (Introduced by John N. Belkin) (15 min.)
- 2:40 p.m. 93. The isolation and identification of the nucleic acids and their derivatives in the ovum of *Rana pipiens*. Samuel Bieber, Jean A. Spence and George H. Hitchings, The Wellcome Research Laboratories, Tuckahoe 7, New York. (15 min.)
- 3:00 p.m. 94. Muscle development and the appearance of an actomyosin-like substance in *Rana pipiens*. Joyce Bruner Lorand and Tomoji Aoto, Northwestern University and the State University of Iowa. (15 min.)

- 3:20 p.m. 95. Transfers of heterologous serum proteins from the pregnant rabbit to various compartments in the fetus. Abraham Kulangara and A. M. Schechtman, University of California, Los Angeles. (15 min.)
- 3:40 p.m. 96. Comparative glucose and fructose metabolism in embryonic and in HeLa cells. Raymond A. Popp, University of Michigan. (Introduced by Clement L. Markert) (15 min.)
- 4:00 p.m. 97. Sulfur metabolism in chick embryo somite genesis. Ronald C. Fraser, University of Tennessee. (15 min.)
- 4:20 p.m. 98. Phosphatase activity in the gonad of the guinea pig during development. Evelina Ortiz, University of Chicago. (15 min.)
- 4:40 p.m. 99. The effect of the carcinogen 2-Acetylaminofluorene on the embryonic development of live-bearing fishes. Kenichi Kenneth Hisaoka, Loyola University. (Introduced by B. J. Jaskoski) (15 min.)
- 5:00 p.m. 100. Time lapse studies on the embryology of the zebra fish, *Brachydanio rerio*. K. K. Hisaoka, J. W. Ott, Jr. and A. L. Marchese, Loyola University. (Introduced by A. F. Hopper) (15 min.; Motion picture.)

LATE WEDNESDAY AFTERNOON SESSION, AUGUST 28TH

Refresher course: Recent Advances in the Study of Animal Behavior.

Concluding Session with Open Discussion. 4:30 P.M.

Dinkelspiel Auditorium

GEORGE BARTHOLOMEW, presiding

Discussants:

FRANK BEACH, Yale University

JOHN T. EMLEN, University of Wisconsin

DANIEL LEHRMAN, Rutgers University

Speakers at other two sessions

WEDNESDAY EVENING SESSION, AUGUST 28TH

Zoologists Dinner at L'Omelette, 4170 El Camino Real in Palo Alto. 7:00 P.M.

Presidential Address by Elmer G. Butler

THURSDAY MORNING SESSION, AUGUST 29TH*Symposium: Metabolic Aspects of Embryonic Differentiation. 9:00 A.M.*

Arranged by Albert Tyler, California Institute of Technology.

(In collaboration with the Western Society of Naturalists)

Room 122, Outer Quadrangle

ALBERT TYLER, presiding

- A. TYLER, California Institute of Technology. Introductory remarks.
- R. FLICKINGER, University of California at Los Angeles. Yolk utilization in the frog embryo in relation to differentiation.
- A. M. SCHECHTMAN, University of California at Los Angeles. Transfer and utilization of proteins in the developing chick and rabbit.
- A. H. WHITELEY, University of Washington. Development, respiratory rate and content of DNA in hybrid embryos of sea urchins.
- Informal small group discussions centering about each of the speakers in separate corners of the room.

Section L. *Radiation Biology: 9:00 A.M.*

Room 121, Outer Quadrangle

HOWARD H. VOGEL, JR. AND E. F. OAKBERG, presiding

- 9:00 a.m. 101. Teratogenesis in grasshopper embryos as a function of the dose rate of X-irradiation. T. N. Tahmisiian and Betty Jean Wright, Argonne National Laboratory. (15 min.)
- 9:20 a.m. 102. X-ray damage and recovery in the mouse testis. E. F. Oakberg, Oak Ridge National Laboratory. (15 min.)
- 9:40 a.m. 103. Radiosensitivity of anoxic skin X-irradiated at different temperatures as reflected in studies employing trypan blue and dose fractionation. J. P. O'Brien and E. J. Frank, Marquette University. (10 min.)
- 9:50 a.m. 104. Irradiation of solely the circulating blood of mammals. J. P. O'Brien, E. J. Frank, H. B. Benjamin and G. E. Bartenbach, Marquette University. (5 min.)
- 10:00 a.m. 105. The distribution of activity of inhaled methyl radioiodide in the rabbit. Paul Foley Nace, L. Donato, G. Debus, P. S. Cookson, J. Moule and L. R. Murrell, McMaster University. (5 min.)

- 10:10 a.m. 106. Deuterium in the body fluids and tissues of mice drinking deuterium oxide. Asher J. Finkel, Joseph J. Katz, Henri L. Crespi and Dorice M. Czajka, Argonne National Laboratory. (15 min.)
- 10:30 a.m. 107. Influence of safe radiation levels on susceptibility to audiogenic seizures in mice. Dorothea Starbuck Miller, University of Chicago. (15 min.)
- 10:50 a.m. 108. The biological hazard of strontium-90 as assayed with CF#1 mice. Miriam P. Finkel, Birute O. Biskis and Gertrude M. Scribner, Argonne National Laboratory. (15 min.)
- 11:10 a.m. 109. The role of the blood in the transportation of strontium⁹⁰-Yttrium⁹⁰ in fish. Howard Boroughs and Della Reid, University of Hawaii. (15 min.)
- 11:30 a.m. 110. Survival of giant amoebae (*Pelomyxa illinoisensis*) after single exposure to Co⁶⁰ γ -rays and to fission neutrons. H. H. Vogel, Jr. and E. W. Daniels, Argonne National Laboratory. (15 min.)
- 11:50 a.m. 111. Recovery following injection of nonirradiated protoplasm into amoebae irradiated with fission neutrons. E. W. Daniels and H. H. Vogel, Jr., Argonne National Laboratory. (15 min.)

Section M. *Cytology and Histology*: 9:00 a.m.

Room 123, Outer Quadrangle

GILBERT WOODSIDE, presiding

- 9:00 a.m. 112. Morphological and physiological changes in the mesonephros of the chick. Ethel Sue Lumb, Vassar College. (15 min.)
- 9:20 a.m. 113. The elasmobranch kidney tubule. Rudolf T. Kempton, Vassar College. (15 min.)
- 9:40 a.m. 114. Comparative histology of the digestive tract of warm and active and hibernating arctic ground squirrels, *Spermophilus undulatus*. William V. Mayer and Sol Bernick, University of Southern California and the Arctic Aeromedical Laboratory. (15 min.)
- 10:00 a.m. 115. Changes in the fine structure of mitochondria during spermatogenesis in a gastropod. Jerome S. Kaye, Columbia University. (Introduced by Arthur W. Pollister) (15 min.)
- 10:20 a.m. 116. Ultrastructure of nerves in the epidermis and blastema of regenerating amphibian limbs. Elizabeth D. Hay, Johns Hopkins University School of Medicine. (15 min.)

- 10:40 a.m. 117. Electron microscope studies on lungs of newborn mice. Gilbert L. Woodside and Albert J. Dalton, University of Massachusetts and National Cancer Institute, National Institutes of Health, (15 min.)
- 11:00 a.m. 118. The visualization of cellular events in wound healing. C. M. Pomerat, C. G. Lefeber and E. E. Pitsinger, University of Texas Medical Branch. (15 min.; Motion picture.)
- 11:20 a.m. 119. The adepidermal reticular network in the skin of the newt, *Triturus*, as seen with the electron microscope. Miriam M. Salpeter and Marcus Singer, Cornell University. (15 min.)
- 11:40 a.m. 120. The physiologic significance of the basement membrane. Rudolf Caesar and George A. Edwards, New York State Department of Health. (15 min.)

THURSDAY AFTERNOON SESSION, AUGUST 29TH

Symposium: Metabolic Aspects of Embryonic Differentiation.

Concluding session. 2:00 P.M.

Room 122, Outer Quadrangle

ALBERT TYLER, presiding

H. HERRMANN, University of Colorado. Amino acid incorporation into proteins of embryonic tissues.

C. L. MARKERT, Johns Hopkins University. Ontogeny of enzymatic activity.

FLORENCE MOOG, Washington University. Differentiation of enzymes in embryos.

E. J. BOELL, Yale University. Respiratory mechanisms in embryonic development.

Informal small group discussions centering about each of the afternoon speakers in separate corners of the room.

Section N. *Experimental Biology and Physiology: 2:00 P.M.*

Room 121, Outer Quadrangle

GORDON H. BALL, presiding

- 2:00 p.m. 121. Relationships of North American Iguanidae as suggested by an analysis of their pinworm parasites, *Cyrtosomum*. Jerome J. Gambino, University of California, Los Angeles. (Introduced by T. L. Jahn) (10 min.)

- 2:15 p.m. 122. Reproductive cycles in some West Coast Echinoderms. A. C. Giese, R. Boolootian, V. Farmanfarmaian, L. Greenfield, J. Bennett and J. Tucker, Stanford University. (15 min.)
- 2:35 p.m. 123. A quantitative study of the individual bones of 105 human skeletons. Edward W. Lowrance and Homer B. Latimer, Universities of Missouri and Kansas. (15 min.)
- 2:55 p.m. 124. Relation of life span to body weight and brain weight of mammals. George A. Sacher, Argonne National Laboratory. (Introduced by E. L. Powers) (10 min.)
- 3:10 p.m. 125. Factors affecting pupation site in *Drosophila*. Robert R. Sokal, Paul R. Ehrlich, Preston E. Hunter and Gunther Schlager, University of Kansas. (15 min.)
- 3:30 p.m. 126. Experimental antipyresis in rats. Marcia White Rosenthal, Joan F. Fried and Jack Schubert, Argonne National Laboratory. (15 min.)
- 3:50 p.m. 127. Metabolic and cardiac responses to temperature in the lizard *Dipsosaurus dorsalis*. William R. Dawson and George A. Bartholomew, Universities of Michigan and California. (15 min.)
- 4:10 p.m. 128. A comparative study of salivary gland and pancreatic amylolytic activity. Harriet Harvey, University of Oklahoma. (15 min.)
- 4:30 p.m. 129. The variation in antibody responses as a function of the antigen. H. R. Wolfe and Samuel F. Reibel, University of Wisconsin. (15 min.)

Section O. *Cytology and Histology*: 2:00 P.M.

Room 123, Outer Quadrangle

CHARLES M. POMERAT, presiding

- 2:00 p.m. 130. Brewer blackbird gall bladder infestation with *Conspicuum icteridorum* (Trematoda) and the histopathology observed. Lucy W. Bassett, University of California, Los Angeles. (Introduced by G. H. Ball) (10 min.)
- 2:15 p.m. 131. Epidermal hypertrophy following topical application of small amounts of vitamin A. Donald J. Lawrence and Howard A. Bern, University of California, Berkeley. (Introduced by Max Alfert) (15 min.)
- 2:35 p.m. 132. A histological study of the combs and ear lobes of White Silkie Bantam fowl following treatment with methylcholanthrene. Charles G. Crispens, Jr. and Herbert L. Eastlick, State College of Washington. (15 min.)

- 2:55 p.m. 133. Effects of versene on chick heart fibroblasts *in vitro*. Ernst J. Dornfeld and Alfred Owczarzak, Oregon State College. (15 min.; Motion picture.)
- 3:15 p.m. 134. Intranuclear inclusion bodies in liver cells of leukemic mice. Irene Corey Diller, Institute for Cancer Research. (15 min.)
- 3:35 p.m. 135. A comparative cytological study of duodenal damage produced by biologically equivalent doses of fission neutrons and Co⁶⁰ γ -rays. S. Leshner and H. H. Vogel, Jr., Argonne National Laboratory. (15 min.)
- 3:55 p.m. 136. The effect of X-rays and testosterone propionate on mitosis in the accessory organs of castrated male rats. John H. D. Bryan and J. W. Gowen, Iowa State College. (10 min.)
- 4:10 p.m. 137. The histochemical localization of certain biochemical intermediates and respiratory enzymes in the developing slime mold, *Dictyostelium discoideum* Raper. Jerome O. Krivanek, Tulane University. (Introduced by E. Peter Volpe) (15 min.)

DEMONSTRATIONS

Section P.

Tuesday, August 27, 1:00-2:00 P.M. and 4:00-6:00 P.M.

Wednesday, August 28, 11:00-12:30 P.M.

Rooms 429A and 429B, Outer Quadrangle

JOSEPH F. OLIPHANT, *in charge*

Those presenting demonstrations are asked to be present at the above times. Since this is not always possible demonstrators have been requested to post a notice showing when they expect to be present.

138. Some amebas from marine and freshwater habitats of Florida. Eugene C. Bovee, University of Florida.
139. The protoplasm of living Foraminifera. Zach M. Arnold, University of California, Berkeley.
140. On the question of trophic action in special sensory systems. Margaret R. Wright, Vassar College.
141. Osteogenesis in different strains of the golden hamster, *Mesocricetus auratus*. Anna Kerschner, Thurston Riehl and Hulda Magalhaes, Bucknell University.
142. The use of tissue cultures in the study of smog. C. M. Pomerat, Y. H. Nakamishi and M. Fernandes, University of Texas Medical Branch.

143. Dry mounts of embryos and of dissections. Emil Witschi, State University of Iowa.
144. Recent observations on nervous tissue *in vitro*. C. M. Pomerat, W. Hild and J. Nakai, University of Texas Medical Branch.
145. Some effects of radio-active phosphorus (P^{32}) on implantation in the female golden hamster. A. L. Soderwell and P. L. Risley, University of Oregon.
146. The nephron by light and electron microscopy. Hans Elias, The Chicago Medical School.
147. Electron micrographs of neuromuscular synapses from mammalian (albino mice) and amphibian (*Rana pipiens*) gastrocnemii muscles. James F. Reger, University of Colorado Medical Center.
148. Interpretation of cicada tymbal muscle function on the basis of its ultra-structure. George A. Edwards, New York State Department of Health.
149. Electron microscope observations of annelid muscle and nerve. George A. Edwards, New York State Department of Health.

PAPERS READ BY TITLE

Papers read by title have been arranged alphabetically by the name of the first author into six groups:

Cytology and Histology

Embryology

Experimental Biology and Physiology

Protozoology

Vertebrate Endocrinology

Papers not otherwise classified.

Cytology and Histology

150. A cytochemical study of cholinesterase activity in the adrenal medulla of the rat. John M. Allen, University of Michigan, Olavi Eränkö, University of Helsinki, and Robert L. Hunter, University of Michigan.
151. Ultramicroscopic structure of the pharyngeal glands of the honeybee. H. W. Beams and Everett Anderson, State University of Iowa.
152. Mast cells in endocrine glands of x-irradiated hamsters. Edward D. Crabb and Margaret A. Kelsall, University of Colorado.
153. Histology of an invertebrate smooth muscle. Helen Wendler Deane and Betty M. Twarog, Harvard University.
154. Further studies of the effect of Poliomyelitis virus types 1, 2, and 3 on human brain cells grown *in vitro*. M. J. Hogue, R. McAllister, A. E. Greene and L. L. Coriell, School of Medicine, University of Pennsylvania.
155. The effects of dicumarol on liver glycogen in the male albino rat. Stephen Karakashian and Joy B. Phillips, Drew University.

156. Cytochemical studies on nucleoli of frog kidney in tissue culture. G. M. Mateyko and M. J. Kopac, New York University.
157. Studies on renal neoplasms in western frogs. G. M. Mateyko, New York University.
158. A preliminary note on the general chemical characterization of plasmocrine products elaborated by human peripheral blood neutrophils *in vitro* by micro-interferometry. Kenneth M. Richter, University of Oklahoma School of Medicine.
159. The cultivation of intact thyroid and parathyroid glands of the adult bat. Kenneth M. Richter, S. Cloud, and B. R. Ritcheson, University of Oklahoma School of Medicine.
160. Studies on the adult bat adrenal gland cultured *in vitro*. Kenneth M. Richter, B. R. Ritcheson and S. Cloud, University of Oklahoma School of Medicine.

Embryology

161. Histochemical studies on developmental stages of polychaetous annelids. M. Jean Allen, Wilson College.
162. The implantation of spinal ganglia into the denervated regenerate of the forelimb of the newt, *Triturus*, and their influence upon subsequent growth. Anne Ashbaugh and Marcus Singer, Cornell University.
163. Hypothallectomy in *Rana pipiens* neurulae. Chih Ye Chang, State University of Iowa.
164. Effects of (ethylenedinitrilo) tetraacetic acid and B-2-thienylalanine on the developing down feather. Robert J. Fabiny and Howard L. Hamilton, Iowa State College.
165. The application of radioautography to studies of tyrosine-melanin synthesis. Walter J. Fimian, Jr., Boston College. (Introduced by Michael P. Walsh.)
166. Growth and organization of partial annular tympanic cartilage rudiments following transplantation. O. M. Helff, New York University.
167. Tongue rudiment development in *Rana catesbeiana* following partial extirpations and autoplasmic transplantations. O. M. Helff, New York University.
168. Characterization of alkaline phosphatase in the developing down feather. Gertrude W. Hinsch and Howard L. Hamilton, Iowa State College.
169. Does protein pass into the ovarian eggs of *Rana pipiens* from the maternal circulation? Manuel C. Kaster and A. M. Schechtman, University of California, Los Angeles.
170. Some immunochemical studies of limb regeneration in the newt, *Triturus viridescens*. Hans Laufer, Cornell University. (Introduced by Marcus Singer.)
171. A new transplantation technique in the chick embryo: intraocular grafting. Application to the epiphysis. Raoul Michel May and Marie Jeanne Thillard, University of Paris.
172. The accumulation of alkaline phosphatase in the duodenum of the fetal guinea pig, with a note on adrenal growth. Florence Moog and Evelina Ortiz, Washington University and University of Chicago.

173. Influence of exogenous ACTH on body weight, adrenal growth, duodenal phosphatase, and liver glycogen in the chick embryo. Florence Moog and Elizabeth Ford, Washington University.
174. The apparent developmental independence of regions of early chick embryo when isolated by transverse cuttings. Olin E. Nelsen, University of Pennsylvania.
175. Gastrulation in the chick embryo. Olin E. Nelsen, University of Pennsylvania.
176. The minimal presence of O₂ in relation to stages of primitive streak development in the chick embryo. Olin E. Nelsen, University of Pennsylvania.
177. Glycogen in normal, regenerating and grafted skin of *Rana pipiens* tadpoles. Leonard Roman and Gordon E. Swartz, University of Buffalo.
178. Supernumerary limb formation in adult urodeles. Laurens N. Ruben, Princeton University and Reed College.
179. The unspecific nature of the "induction" of supernumerary limbs in urodeles. Laurens N. Ruben, Reed College.
180. Cellular movements in early forelimb regenerate of the newt, *Triturus*, and their relation to the nerve. Marcus Singer and Eva K. Ray, Cornell University.
181. Transmission of proteins from the blood of the hen to the yolk and blood of the embryo. Edward Sounhein and A. M. Schechtman, University of California, Los Angeles.
182. The effect of pretreatment with cysteine on the suppression of regeneration capacity in the larval urodele limb by x-irradiation. Benjamin D. Stinson and L. G. Barth, Columbia University.
183. The specificity of homograft tolerance. Paul Terasaki, Jack A. Cannon, and William P. Longmire, Jr., University of California, Los Angeles. (Introduced by Frederick Creseitelli).
184. Chicken serum proteins from the fifth day of development to the adult. E. M. Weller and A. M. Schechtman, University of California, Los Angeles.

Experimental Biology and Physiology

185. Some observations on the agglutination of the coelomic corpuscles in the polychaete *Eudistylia polymorpha*. C. L. Brandt and A. C. Giese, University of Texas and Hopkins Marine Station.
186. An annual metabolic cycle in an organism in constant conditions, including pressure. Frank A. Brown, Jr., Northwestern University.
187. Effect of some estrone derivatives on tail regeneration in frog larvae. Harold R. Dettelbach and Richard A. Edgren, G. D. Searle and Co.
188. Influence of testosterone on acetate activation by rat ventral prostate minces *in vitro*. W. E. Farnsworth and M. W. Farnsworth, Veterans Admin. Hospital and University of Buffalo.
189. The binding of testosterone by ventral prostate minces *in vitro*. W. E. Farnsworth and M. W. Farnsworth, Veterans Admin. Hospital and University of Buffalo.
190. Comparison of the chromatophorotropic activity of eyestalk and central nervous organ extracts of two crayfishes. Milton Fingerman, Tulane University.

191. Endocrine regulation of the red chromatophores of the crayfish *Orconectes clypeatus*. Milton Fingerman, Tulane University.
192. The effects of three winters of hibernation upon thirteen-lined ground squirrels. G. Edgar Folk and John R. Carter, College of Medicine, State University of Iowa.
193. Specificity of the NaCl appetite of adrenalectomized rats. Melvin J. Fregly, University of Florida.
194. The quantitative assay of the juvenile hormone of insects. Lawrence I. Gilbert and Howard A. Schneiderman, Cornell University.
195. Podophyllotoxin, podophyllin, and podophyllotoxin isopropyl ammonium glutarate as inhibitors of development of the fruitfly, *Drosophila melanogaster*. E. D. Goldsmith, New York University.
196. Reactivity of DNA from xiphophorin fishes to aldehyde-coupling reagents. Sylvia S. Greenberg, M. J. Kopac and Myron Gordon, New York University and Genetics Laboratory, New York Zoological Society.
197. Sodium secretory cells in fiddler crab gills. James W. Green and Mary Harsch, Rutgers University.
198. Serological investigations of aggregateless variants of the slime mold, *Dictyostelium discoideum*. James H. Gregg, University of Florida.
199. Transplantation of ovaries of the obese mouse. Katharine P. Hummel, Roscoe B. Jackson Memorial Laboratory.
200. Cyclic movements of the midgut of *Anopheles quadrimaculatus* larvae. Jack Colvard Jones, Laboratory of Tropical Diseases, National Institutes of Health.
201. A phase contrast study of the blood cells of the adult cockroach, *Periplaneta americana* (L.). Jack Colvard Jones, Laboratory of Tropical Diseases, National Institutes of Health.
202. Endocrine regulation of preliminary limb regeneration and molting in the crab *Sesarma*. Sidsel Jyssum and L. M. Passano, Yale University.
203. Freezing point depressions of common anticoagulants. Harold M. Kaplan and Edward Stephens, Southern Illinois University.
204. Osmoregulation and excretion in the tunicate *Molgula*. L. H. Kleinholz, Reed College.
205. The direct measurement and significance of changes in intratracheal gas composition during the respiratory cycle of the Cecropia moth. Robert I. Levy and Howard A. Schneiderman, Cornell University.
206. The role of liver damage and hypoxia on plasma erythropoietin titer. E. A. Mirand and T. C. Prentice, Roswell Park Memorial Institute.
207. Responses to depolarizing currents across the membrane of some invertebrate ganglion cells. T. Otani and Theodore H. Bullock, University of California, Los Angeles.
208. Effects of simulated altitude exposure on turtles. Milton Parker and Paul D. Altland, National Institutes of Health.
209. Effects of stathmokinetic agents on planarian reconstitution. Edward J. Pollock and Richard A. Edgren, Miles Township High School, Skokie, Illinois.
210. Hyperplasia of the perihepatic granulocytopoietic tissue in hepatectomized newts. Jacqueline L. Pratt, Sophie Jakowska and Ross F. Nigrelli, College of Mount St. Vincent and New York Zoological Society.

211. Effects of holothurin on survival and regeneration of planarians. Nannette D. Quaglio, Stephanie F. Nolan, Agatha M. Veltri, Patricia M. Murray, Sophie Jakowska and Ross F. Nigrelli, College of Mount St. Vincent and New York Zoological Society.
212. Influence of growth hormone on the hemopoietic depressing action of aminopterin. Frank T. Ricciardi and Albert S. Gordon, New York University.
213. The nature of the crystal cells of *Drosophila melanogaster*. M. T. M. Rizki, Reed College.
214. The effect of carbon monoxide on the eye pigment development of *Moroniella* and *Drosophila*. Sr. Mary Christopher Rohner S.N.D. and Alexander Wolsky, Fordham University.
215. Growth of the kidney of the foetal rat following bilateral nephrectomy of the mother. H. Dundan Rollason, University of Massachusetts.
216. Effects of bile salts on tapeworm metabolism. Alvin H. Rothman and Clark P. Read, Johns Hopkins University.
217. Blood cell count as an indicator of radiosensitivity. Roberts Rugh and Joan Wolff, Columbia University.
218. Comparison of the effects of acute and fractionated irradiation on fertility of the female mouse. Liana Brauch Russell and M. Kathren Freeman, Oak Ridge National Laboratory.
219. Recovery of diapausing larvae of a chalcid wasp from x-irradiation. Howard A. Schneiderman, James Weinstein and Judith Horwitz, Cornell University.
220. The distribution and chemical properties of the juvenile hormone of insects. Howard A. Schneiderman and Lawrence I. Gilbert, Cornell University.
221. Prevention of accumulation of acid metabolites during total cardiac by-pass. Louis A. Susca and Vito V. Pagano, New York Medical College.
222. Effects of erythropoietic stimuli on the plasma volume of bone marrow. Myron Tannenbaum, Bernard S. Morse and Albert S. Gordon, New York University.
223. Inhibition and acceleration in some invertebrate ganglion cells. Carlo A. Terzuolo and Theodore H. Bullock, University of California, Los Angeles.
224. Observations on osmoregulation in *Aplysia juliana*. P. B. van Weel, University of Hawaii.
225. Influence of ascorbic acid and chlorpromazine on body temperature and resistance to drowning in mice. James D. Witherspoon, Howard W. Short and William A. Hiestand, Purdue University.
226. The erythropoietic activity of urine from anemic humans. John Winkert, Albert S. Gordon, Sam J. Piliero, Paul T. Medici and A. Leonard Luhby, New York University, St. John's University and New York Medical College.

Protozoology

227. Some observations on division in *Lacrymaria olor*. Eugene C. Bovee, University of Florida.
228. Cross-resistance to p-aminobenzoic acid and isonicotinic acid hydrazide in *Chilomonas*. R. P. Hall, New York University.
229. Effects of some carcinogens on division rate of *Tetrahymena*. Curtis Krock and A. C. Giese, Stanford University.

230. Purine metabolism and the growth of *Stylonychia* in the absence of other living organisms. Benedict R. Lucchesi and Daniel M. Lilly, St. John's University.
231. The response of *Trichomonas gallinae* to cholesterol and dihydrocholesterol. Manley Mandel and Bronislaw M. Honigberg, University of Massachusetts.
232. Diurnal change of mating type in *Paramecium*. T. M. Sonneborn, Indiana University.
233. A new variety (14) of *Paramecium aurelia* and its relations to varieties 4, 8, and 10. T. M. Sonneborn, Indiana University.
234. An amiconucleate strain of *Tetrahymena* induced by severe x-ray irradiation. Carl Caskey Speidel, University of Virginia.

Vertebrate Endocrinology

235. Influence of hormones on cell division: II. Testosterone propionate. John M. Allen, University of Michigan.
236. Adrenal cortical function during the estrous cycle of the albino rat. Richard K. Boohar and Joy B. Phillips, Drew University.
237. Thyroxine effect on pigmentation in *Xenopus*. Chih Ye Chang, State University of Iowa.
238. Influence of prepuberal age on number of ova that can be superovulated in the mouse. Allen H. Gates and Meredith N. Runner, Roscoe B. Jackson Memorial Laboratory.
239. The effect of sex hormones on the amylolytic activity of submaxillary, parotid and pancreas of the laboratory mouse. Harriet Harvey, University of Oklahoma.
240. Effect of thyro-parathyroidectomy on the anti-inflammatory activity of cortisol in the cotton granuloma test. L. G. Hershberger, G. D. Searle and Co.
241. The estrus cycle in alloxan-diabetic rate. Ernest L. Hunt and B. E. Frye, Emory University.
242. Ovulation in the prepuberal mouse—a delicate bioassay for gonadotropin. Meredith N. Runner, Roscoe B. Jackson Memorial Laboratory.
243. Pregnancy testing service based upon ovulation in the prepuberal mouse. Meredith N. Runner and Cora Harris, Roscoe B. Jackson Memorial Laboratory.
244. Glucagon and deposition of glycogen in rat diaphragm. James G. Snedecor, University of Massachusetts.
245. Effect of thymectomy on the blood pressure of rats. F. M. Sturtevant, G. D. Searle and Co.
246. Steroid diabetes in guinea pigs. F. M. Sturtevant, G. D. Searle and Co.

Papers Not Otherwise Classified

247. The effect of hormones upon juvenile lizards, *Anolis carolinensis*. Llewellyn Thomas Evans, Albert Einstein College of Medicine, Yeshiva University.
248. A comparison of large race III and small race X of rabbits. Homer B. Latimer, University of Kansas and Paul B. Sawin, Roscoe B. Jackson Memorial Laboratory.

249. Hereditary differences in the chaetotaxis of two inbred strains of *Drosophila melanogaster* from geographically separated areas. Sr. M. Cecilia Agnes Mulrennan C. S. J. and Alexander Wolsky, Fordham University.
250. Mass mortalities of marine fishes in the Gulf of Saint Lawrence 1954-1956. Carl J. Sindermann, U. S. Fish and Wildlife Service.
251. A report on the Ostracoda of Great Slave Lake. Willis L. Tressler, U. S. Navy Hydrographic Office.
252. Parasites of Amphibia. A. C. Walton, Knox College.
253. Parasites of Amphibia. A. C. Walton, Knox College.
254. Dry season adaptations of fungus-growing ants and their fungi. Neal A. Weber, Swarthmore College.
255. Weeding as a factor in fungus culture by ants. Neal A. Weber, Swarthmore College.
256. Recent collections of the albinistic cave crayfish, *Cambarus hubrichti*. Patrick H. Wells, Occidental College and Arthur Witt, Jr., University of Missouri.

By application of the Sanger fluorodinitro-benzene procedure the N-terminal amino acid has been identified as tyrosine. Associated with the tyrosine in the N terminal peptide are cysteine, aspartic and glutamic acids, serine and lysine.

By conversion of amino acids in the hydrolysate to DNP derivatives, chromatographic separation, and spectrophotometric assay, the number of residues of each amino acid in each protein molecule were estimated. The number of titratable groups computed upon this basis corresponds with the number determined by direct titration.

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- 209 EFFECTS OF STATHMOKINETIC AGENTS ON PLANARIAN RECONSTITUTION. Edward J. Pollock and Richard A. Edgren, Niles Township High School, Skokie, Illinois.

McWhinnie (Biol. Bull. 108:54, 1953) showed that colchicine inhibited reconstitution in planaria, which suggested that other stathmokinetic agents might have similar activities. Therefore, the effects of nitrogen mustard and maleic acid hydrazide were studied on *Dugesia tigrina* and *D. dorotocephala* respectively. Worms were cut at three levels (A, C, and D of Rulon, Physio. Zool., 11: 202, 1938). The reconstitution of normal heads in the three posterior sections was employed as an index of effect. Both compounds were used at the following concentrations: 20, 10, 5 and 2.5 times 10^{-3} M/l. Ten sections from each level were treated at each concentration.

Continuous treatment with nitrogen mustard killed all sections; however, a 1 hour shock treatment was found to be satisfactory. The proportion of normal heads decreased with increasing concentration of the mustard.

Similar results were obtained with continuous maleic acid hydrazide treatment; however, this material was ineffective when a 1 hour shock treatment was employed. Again proportion of normal heads decreased with increased drug concentration.

With both compounds the proportion of normal heads appeared to decrease linearly with concentration. The slopes of the concentration-response curves appeared parallel for each drug and for each level of cut on the worm.

- 144 RECENT OBSERVATIONS ON NERVOUS TISSUE IN VITRO.¹ C. M. Pomerat, W. Hild and J. Nakai,² University of Texas Medical Branch. (Demonstration)

Tissue cultures of nervous tissue have been used to develop standard systems for experimental neurocytology. This is illustrated with the cerebellum of newborn kittens.

In the regeneration of neurons from dissociated dorsal root ganglia, the mode of process formation including collaterals was recorded cinematographically. Pinocytosis and the rate of vacuolar ascent in axons were analyzed. Nuclear rotation was observed in 16 out of 64 regenerating neurons.

Perfusion chamber experiments reveal disturbances which are believed to be specific for neurons of the paraventricular nucleus with the introduction of