

At the Sixty-seventh Meeting of the American Ornithologists' Union, in Buffalo in October, 1949, the following were elected fellows: Dean Amadon, John T. Emlen, Jr., George H. Lowery, Jr., J. Dewey Soper, and R. M. Strong. Persons elected to the class of full membership were: John H. Baker, George A. Bartholomew, Jr., Harvey Brackbill, Charles L. Broley, Edward B. Chamberlain, William B. Davis, Frank L. Farley, William E. Godfrey, Joseph C. Howell, Junea W. Kelly, R. J. Longstreet, Seth H. Low, Thomas H. Manning, Harold D. Mitchell, George A. Petrides, Chandler S. Robbins, Charles G. Sibley, Robert E. Stewart, Charles Vaurie, Laidlaw Williams. Honorary fellows were Robert A. Falla, Alessandro Ghigi, and R. E. Moreau. Officers of the preceding year were reelected. New council members were Ira N. Gabrielson, Ludlow Griscom, Ernest Mayr, and A. W. Schorger.

Applications for the 1950 Louis Agassiz Fuertes Research Grant of \$100 are now in order. Information may be obtained from the June, 1948, issue of the *Wilson Bulletin*. Details and application blanks may be obtained from the chairman of the committee, Dr. Charles G. Sibley, Department of Natural Sciences, San Jose State College, San Jose, California.

PUBLICATIONS REVIEWED

THE FLIGHT OF BIRDS ANALYZED THROUGH SLOW-MOTION PHOTOGRAPHY. By John H. Storer. Cranbrook Institute of Science Bulletin No. 28, xvi + 94 pp., frontispiece and 176 figures. Cloth binding. \$2.50.

As a photographer whose beautiful slow-motion pictures of birds in flight are outstanding, Mr. Storer is well qualified to describe the intricate movements of birds in flight. In this compact book he endeavors to explain, in terms of simple aerodynamics, the movements of the feathers and wings of birds as revealed by his photographs. The analogy between bird and plane is more strongly emphasized than in any previous book on this subject.

The principles of the aerodynamics of the aircraft wing which the author feels to be important in the flight of birds include lift, drag, flaps, slots, pressure distribution, tip vortex, and loading. Dihedral angle, of seeming importance in soaring, is not mentioned. In the section entitled "The bird's flying equipment," feather and wing structure and wing adaptations are discussed. Here the main variation from previous works is that the

propeller-like action of the primaries in flapping flight is emphasized. The primaries act like a variable-pitch propeller and at times the bird "becomes a helicopter." The last section, comprising two-thirds of the book, is entitled "Flight," and includes discussions of landing, takeoff, soaring, speed, and maneuverability. Finally there appear a one-page glossary, a three-page index, and a list of ten references.

Most of the failings of the text involve the references. Extensive works on bird flight such as those by Horton-Smith, Hankin, or Headley are not mentioned. No references on flight antedating 1937 are considered. The basic questions raised by previous workers, such as whether birds can soar in a horizontal wind of varying velocity and exactly how a soaring bird steers, remain unanswered. No references are given for many statements which one might want to verify, such as those that the space between the wing and tail acts like an airplane slot, that some birds cannot take off or land without the alula, and that birds flying in formation use the energy from the wing tip vortex of the bird ahead. It is confusing to find Poole's term "wing ratio" used interchangeably with the established term "wing loading," for these terms denote reciprocal values. It is stated (p. 75) that Poole found that the heavier sex has a lower "aspect ratio" whereas the cited author was referring to wing ratio. The dates given for the works of Poole and Graham are different in the text and in the list of references. Some of Cooke's questionable records of speed, such as 180 miles per hour for a Duck Hawk, are repeated.

The work of Woodcock correlating observations of the soaring of gulls with experimental patterns of rising air currents over a uniform source of heat is cited at length to explain soaring over the ocean at altitudes above obstruction currents. Previous authors have explained such soaring in terms of the increase of wind velocity with altitude. Observations of soaring in the tropics in the absence of wind, such as those made by Hankin, might well be reexamined in the light of the findings of Woodcock.

Most of the figures are halftones, one and one-half by two inches in size, evidently enlarged from 16-millimeter motion picture film. These pictures are adequately sharp to illustrate the text although they lack definition. About one-half of the pictures of birds are of the American Egret. The designation of the time between exposures in a series is variously given in frames, in fractions of seconds, in both, or in neither.

The study of the flight of birds through observation and ordinary slow-motion photography is now well into the period of diminishing returns. Marey photographed gulls at a rate of 50 pictures per second before man could fly and Mr. Storer's pictures were taken only two and one-half times as fast. For further advance in the study of bird flight we need experimentation and new methods such as stroboscopic photographs of birds flying in a wind tunnel where air currents can be controlled.—CARL B. KOFORD.

COOPER CLUB MEETINGS

NORTHERN DIVISION

JUNE.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, June 23, 1949, at the University of California, Berkeley, California. The following proposals for membership were read: Mrs. Lucile S. Waite, 342 63rd St., Oakland 9, Calif., and Ethel Bumbaugh, 394 Orange St., Oakland 10, Calif., by Junea W. Kelly; and Mrs. Bertha M. Rice, P. O. Box 1147, San Jose, Calif., by Lois C. Taylor.

The program for the evening was devoted to several extensive field reports from members. Included was a report by Henry Childs on his studies of 30 nesting pairs of Brown Towhees on the University of California campus.—LOIS C. TAYLOR, *Acting Secretary*.

SEPTEMBER.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, September 1, 1949, at the University of California, Berkeley, California. The following names were proposed for membership: Miss Louise F. Perring, 4821 Cedar Ave., Philadelphia 43, Pa., by Junea W. Kelly; Philip Hanford Arend, 2399 Prospect Ave., Berkeley 7, Calif., by Paul Covel; Vincent Surr, 64 Panoramic Way, Berkeley 4, Calif., by Wade Fox; William D. Thompson, 541 Wildwood Ave., Jackson, Mich., by Alden H. Miller; and Juan C. Esteban, Instituto Miguel Lillo, Tucumán, Argentina, by Frank A. Pitelka, the last for life membership.

Mr. Childs reported for the conservation committee that Berkeley Aquatic Park is to be maintained and improved. John Davis described the capture of a young Arctic Three-toed Woodpecker in Reds Meadows. John Chatten reported that health conditions for waterfowl in the Tule Lake and Klamath Refuges have greatly improved.

Dr. George A. Bartholomew, Jr., the speaker of the evening, discussed the "Effect of Day-length and Light Intensity on Reproduction in Birds."—LOIS C. TAYLOR, *Acting Secretary*.

SOUTHERN DIVISION

SEPTEMBER.—The regular meeting of the Southern Division of the Cooper Ornithological Club was held on September 27, 1949, at the University of Southern California. The following names were proposed for membership: Lawrence B. Chapman, 1 Woodridge Rd., Wellesley 81, Mass., and James Henry Bruns, St. Francisville, Louisiana, by W. L. Chambers; Mrs. Herbert C. Judd, 1715 N.E. Buffalo St., Portland 11, Oregon, by Sidney B. Peyton; Dr. Ray C. Erickson, Malheur National Wildlife Refuge, Box 113, Burns, Ore., by S. G. Jewett; Mrs. Ernest Koch, 1188 Dolores St., San Francisco 10, Calif., by Junea W. Kelly; Ronald Arch Ryder, Colorado Cooperative Wildlife Research Unit, Ft. Collins, Colo., by F. A. Pitelka; H. A. Allen, 607 S. Hill St., Los Angeles 14, Calif., Mrs. Ray J. Haley, 950 Leyden St., Denver 7, Colo., and R. D. Sweeney, 460 N. Las Palmas, Los Angeles 4, by W. J. Sheffler; Francis Henry Boynton, 163 State St., Pasadena 2, Calif., J. Fred Denton, 1510 Pendleton Rd., Augusta, Georgia, George J. Dickerson, 6220 Temple Hill Dr., Los Angeles 28, Calif., Mrs. Arthur R. Gunn, 401 E. Sycamore Ave., El Segundo, Calif., Don Johnson, 1435 S. Van Ness, Santa Ana, Calif., James Bradley Nickels, 13157 Valley Vista, North Hollywood, Calif., Robert A. Norris, 165 Wilcox St., Athens, Georgia, and Lorna Weber, 403 S. Sycamore Ave., El Segundo, Calif., all by C. V. Duff. The Southern Division voted unanimously to elect Stanley G. Jewett, J. R. Pemberton and John McB. Robertson to Honorary Membership in the Club. [Similar action in concurrence has been taken by the Northern Division.]

W. N. Jupe presented a colored motion picture, "Desert Birds," which included a life history of a Costa Hummingbird. He also showed a short film on the Great Gray Owl in the Yosemite region.—DOROTHY E. GRONER, *Secretary*.

OCTOBER.—A special meeting of the Southern Division of the Cooper Ornithological Club was held on October 4, 1949, at the University of Southern California. The following names were proposed for membership: William N. Jupe, 3450 Primera Ave., Los Angeles 28, Calif., James Black Meyer, Jr., 4523 Firmament Ave., Encino, Calif., and Lewis C. Sommerville, Lodi Academy, Lodi, Calif., all by C. V. Duff.

Jean Delacour, the speaker, compared some European, African and Asiatic forms of birds with certain local western North American species.—DOROTHY E. GRONER, *Secretary*.