the fresh fall plumage the red is of a dull pinkish hue (burnt carmine); there is thereafter a progressive change, slow in autumn, rapid in spring, until the breeding season finds the amorous males, bubbling with song, and going through various courting antics, arrayed in brilliant poppy red.

A nuptial attire has been donned, in the male only, but there has been no replacement of feathers; nor has there been an influx of new pigment into the feather as a former most unsound theory presupposed.

Microscopical examination of various feathers appropriately selected during the period of molt, when old and new feathers are to be found side by side, discloses the following facts: In the newly acquired, unworn plumage, the red pigment is restricted to the barbs of the contour portion of each feather, except for their terminal portions to a distance of one millimeter from their tips. These barb ends, which thus together constitute a band terminating each feather, and *all the barbules,* are white. In the extremely old, abraded (spring and autumn) feather these grayish white end portions of the barbs in the overlapping feathers, and all the barbules, have simply been broken off through attrition and lost, thus removing the grayish obscuration, and disclosing the bright red of the barbs, the tone of which has not in fact changed one whit.

Thus wear alone has accomplished the nuptial brightening of dress. A difference of structure is evident between the pigmented and unpigmented portions of the feather, the former being by far the most resistant, the latter being so adjusted in extent and texture as to become disintegrated and lost at the advent of the season of mating.

The production of color in the growing feather in August is thus clearly anticipatory; and we observe here manifestation of a most delicate structural complex, so balanced as to bring about through purely extrinsic, physical agencies, a conspicuous brightening of plumage at the season of reproduction, seven to nine months later.

The chief point to which I wish to fix attention is, that the brilliant hue of the nuptial dress is thus in reality acquired at the post-nuptial (or annual) molt, several weeks *after* the season of mating, instead of immediately preceding. This fall molt period is generally considered (as by bird fanciers and poultry raisers) to be the season of the year when the vitality of the bird is at its lowest ebb. Moreover, the organs of reproduction are at this time much reduced in size, and certainly quiescent in function. It would seem, therefore, that the production of the brilliant nuptial plumage in the linnet (and similar sequence of processes and results is well known to occur in many other passerine birds[1]) is *not* directly associated with a period of excessive sexual vigor, as a current theory postulates.

J. GRINNELL
MUSEUM OF VERTEBRATE ZOOLOGY,
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THE OKLAHOMA ACADEMY OF SCIENCE

THE academy held its second annual meeting at the State University at Norman, November 25–26. In spite of the fact that this was only its second annual meeting, about forty papers were read, among which were the following:

"The Human Tonsillar Band as a Protective Organ," Dr. J. D. McLaren.

"Study of Lipase," H. I. Jones.

"The Physical and Chemical Changes in the Burning of Clays," L. C. Snider.

"The Road Material of Oklahoma," L. C. Snider.

"The Future Sources of Power in Oklahoma," C. N. Gould.

"A Brief History of Oklahoma Geology," C. N. Gould.

"Comparison of the Four Mountain Uplifts in Oklahoma," C. N. Gould.

"The Oklahoma Redbeds," C. N. Gould.

"The Ecology of the early Juvenile Life of the Unionidæ," F. B. Isely.

"The Unionidæ of the Red River Drainage System," F. B. Isely.

"Notes of the Experimental Study of the Growth and Migration of Mussels," F. B. Isely.

[1] See, especially, Dwight, *Annals N. Y. Acad. Sci.*, Vol. XIII., 1900, pp. 73–360.

"A Method of Treating Complex Sulphides and a few of the Difficulties in Putting it into Practise," D. D. Dunkin.

"Glaciation in the Pikes Peak Quadrangle," C. H. Taylor.

"The Igneous Rocks about Cold Springs, Oklahoma," C. H. Taylor.

"The Ancestral Form of the Testudinata: An Embryological Study," H. H. Lane.

"The Stratigraphy of the Oil Region of Northeastern Oklahoma," D. W. Ohern.

"The Present Stage of the Canadian River," D. W. Ohern.

"The Study of American Government in the Public Schools," Clinton O. Bunn.

"Nationalism versus Internationalism," J. H. Sawtell.

"The Glass Sands of Oklahoma," Frank Buttram.

"Relation of Ionization to the Toxicity of Disinfectants: Preliminary Report," Oscar Harder.

"A Rapid Method of the Estimation of Salts in Butter: Preliminary Report," G. Y. Williams.

"A New Rapid Modification of the Iron-hæmatoxylin-orange G Method for Nerve Sections," A. M. Alden.

"The Application of Astronomy to Historical Research," Henry Meier.

"The Grignard Reaction," H. I. Jones.

"Building Stone Possibilities of Oklahoma," L. L. Hutchinson.

"The Available Coal of Oklahoma," L. L. Hutchinson.

"The Physical Characteristics of the Negro," Dr. A. C. Hirschfield.

"The Origin of the Concave Profile of Volcanoes," D. W. Ohern.

"The Human Heart and Dangers that Threaten it," G. T. Howerton.

"Post-mortem Findings in a Case of Pityriasis rubra pilaris," C. D. Blatchley.

The academy appointed a committee, of which Dr. C. N. Gould is chairman, to consider the advisability of securing state aid in publishing the proceedings of the academy. Another committee was appointed to institute a biological survey of the state. Of this committee Professor H. H. Lane is chairman. The academy is using all the influence that can be possibly brought to bear upon the people of the state to push forward the study of the various animal and plant forms before the influence of man disturbs natural conditions.

The next annual meeting of the academy will be held at the Central State Normal at Edmond, November 26–27, 1911.

D. W. Ohern,
Assistant Secretary

THE ASSOCIATION OF TEACHERS OF MATHEMATICS IN THE MIDDLE STATES AND MARYLAND

The fifteenth meeting of the association was held at the University of Pennsylvania, Philadelphia, on November 26, 1910. The program for the morning session was:

Address of welcome, Edgar F. Smith, vice-provost, University of Pennsylvania.

Miscellaneous business.

"Is the Average Secondary-school Pupil able to acquire a Thorough Knowledge of all the Mathematics ordinarily given in these Schools?" Isaac J. Schwatt, University of Pennsylvania. Discussion led by Rev. James J. Dean, Villanova College; Edward D. Fitch, the DeLancey School, Philadelphia, and E. B. Ziegler, Conshohocken, Pa.

Election of officers.

Following the morning session the association was entertained at luncheon by the university.

The program for the afternoon session was:

"Training for Efficiency in Elementary Mathematics," Ernest H. Kock, Jr., Pratt Institute, Brooklyn.

Report of the Committee on Mathematics in Continuation Schools, William E. Breckenridge, chairman, Stuyvesant High School, New York City.

Report of the Committee on Algebra Syllabus, Gustave Le Gras, chairman, College of the City of New York.

The officers for 1910–11 are: *President*, William Henry Metzler, Syracuse University, Syracuse, N. Y.; *Vice-president*, Philip R. Dean, Curtis High School, Staten Island, N. Y.; *Secretary*, Howard F. Hart, Montclair High School, Montclair, N. J.; *Treasurer*, Mrs. Clara H. Morris, High School for Girls, Philadelphia, Pa.; *Council Members*, Paul N. Peck, George Washington University, Washington, D. C.; Susan C. Lodge, Philadelphia Collegiate Institute, Philadelphia, Pa.; Eugene Randolph Smith, Polytechnic Preparatory School, Brooklyn, N. Y.; Isaac J. Schwatt, University of Pennsylvania, Philadelphia, Pa.; Clifford B. Upton, Teachers College, New York City; Fletcher Durrell, Lawrenceville School, Lawrenceville, N. J.

Howard F. Hart,
Secretary