

Gray red (heterozygous) ♀	→	gray red	3
×		gray pink	601
		ebony red	584
Ebony pink ♂	→	ebony pink	4

This gives a total of 158 cross-overs out of 2,914 flies, but the absolute proportion is not very significant, because of the variability mentioned above. That rather strong linkage exists, however, there can be no doubt.

A. H. STURTEVANT

COLUMBIA UNIVERSITY,
May, 1913

THE NORTH CAROLINA ACADEMY OF SCIENCE

THE twelfth annual meeting of the North Carolina Academy of Science was held in the Science Building at the State Normal College, Greensboro, on Friday and Saturday, April 25 and 26, 1913.

Following a meeting of the executive committee early on Friday afternoon, a session was held for the reading of papers. At the night meeting, after an address of welcome by President J. I. Foust, of the college, President C. S. Brimley, of the academy, delivered his presidential address on "Zoo-geography." Adjournment was then had to the Students' Building, where the members of the academy were given a reception by the faculty of the college.

On Saturday morning the academy met for its annual business meeting. Reports were then made by the secretary-treasurer and the several stated committees. Twelve new members were elected. The finances were shown to be in good shape—all bills being paid, with \$125 in the savings bank. It was noted that Dr. C. W. Stiles, one of our members, had by action of the executive committee been appointed to represent the academy at the Ninth International Zoological Congress at Monaco, March 25-29, 1913.

The following officers were elected for the ensuing year:

President—Franklin Sherman, state entomologist, Raleigh.

Vice-president—Z. P. Metcalf, professor of entomology, North Carolina Agricultural and Mechanical College, West Raleigh.

Secretary-treasurer—E. W. Gudger, professor of biology, State Normal College, Greensboro.

Additional Members of Executive Committee—W. C. Coker, professor of botany, University of

North Carolina, Chapel Hill; J. J. Wolfe, professor of biology, Trinity College, Durham; C. S. Brimley, naturalist, Raleigh.

Following the business meeting, the reading of papers was resumed and continued until the program was finished and adjournment had at 1:15 P.M. The attendance was 27 out of a membership of 76. There were 22 papers on the program. Four of these were read by title, one was presented by another member in the absence of the author, and the other 17 were read by their authors in order as called for on the program.

The papers read were as follows:

Zoo-geography: C. S. BRIMLEY, Raleigh.

Briefly discusses the primary life areas of the world, which the author believes to be five in number, namely, an Australian, a Neotropical, an Ethiopian, an Indian with the limits usually assigned to them by zoologists, and lastly a Northern Realm, including all of the earth's land surface lying north of the other four. The paper then divides the Northern Realm into three regions, an Arctic, a Eurasian and a North American, and proceeds to divide the North American continent into the usual seven life zones, Arctic, Hudsonian, Canadian, Alleghanian, Upper Austral, Lower Austral and Tropical. The life zones entering the state of North Carolina are then discussed at greater length and found to be four in number, the Canadian, Alleghanian, Upper and Lower Austral. The first is stated to occupy the summits of the mountains above about 4,500 feet, the second that portion of the mountain region lying between 2,500 and 4,500 feet elevation, the third comprising the mountain valleys under 2,500 feet, and the central part of the state lying between the mountains and a line drawn from Weldon to Raleigh, and thence to Charlotte, the fourth including the remainder of the state, namely, all lying south and east of the above-named line. The animals distinctive of these zones are named and certain irregularities and anomalies in distribution are pointed out.

This paper will appear in full in the May issue of the *Journal of the Elisha Mitchell Scientific Society*.

Will Cells of the Embryo Sea Urchin, when Introduced into the Body of the Adult, become Tissue Cells of the Latter? H. V. WILSON, University of North Carolina, Chapel Hill.

Plasmodia formed by union of lymph cells were allowed to engulf blastulae, and were grafted on the wound membranes which close in apertures

made in the test of the urchin. The blastulæ after certain changes broke up into their constituent cells. In this way dissociated embryonic cells were brought into the midst of a developing membrane, having a very simple histological character. In the actual experiments a very large proportion of the embryonic cells underwent degeneration. There was some evidence, though by no means convincing, that groups of the smaller cells became part of the developing membrane.

Alternation of Generations in Padina: JAS. J. WOLFE, Trinity College, Durham.

While at work on the life history of *Padina* at the Fisheries Laboratory at Beaufort it seemed worth while to test the theory of alternation of generations in such plants by the cultural methods devised by Hoyt.¹ Numerous cultures were made during the summer of 1910 and the next—all having but indifferent success. They were repeated in 1912 with somewhat better results. The cultures of tetraspores produced a total of 134 male, 154 female, and no tetrasporic plants. Those from fertilized eggs were somewhat less conclusive. Nevertheless, the evidence from cultures strongly supports the view that in *Padina* there is a real alternation of sporophyte with gametophyte.

Gestation in the Nurse Shark, Ginglymostoma cirratum: E. W. GUDGER, State Normal College, Greensboro, N. C.

A brief description was given of the breeding habits and of some points in the embryology of this shark, which was studied at the laboratory of the Carnegie Institution at Tortugas, Florida, in June and July, 1912. A brief account has been published in the Year Book for 1912 of the Carnegie Institution of Washington, Department of Marine Biology, pages 148–150.

Hybridization Experiments on Frogs: W. C. GEORGE, University of North Carolina, Chapel Hill.

Chorophilus n. feriarum was crossed with *Acris gryllus*. About half of the eggs segmented. (In the pure *Chorophilus* control practically all the eggs segmented.) The development was markedly retarded and was abnormal. The conspicuous abnormalities concerned the behavior of the yolk pole. Thus segmentation at this pole was not perfect, and the closure of the blastopore was interfered with in such wise that there developed the well-known abnormal type produced in so many ways, characterized by a large blastopore area and the differentiation of the neural plate.

¹ *Bot. Gaz.*, January, 1910.

The Toxicity of Cottonseed Meal: W. A. WITHERS, J. F. BREWSTER, L. F. WILLIAMS and J. W. NOWELL. With the collaboration of R. S. CURTIS and G. A. ROBERTS, North Carolina Experiment Station, West Raleigh.

The authors conclude from experiments, some of which have been published,¹ that the toxicity of cottonseed meal is due to a constituent group of the proteins, probably one containing loosely bound sulphur. They suggest some form of iron as an antidote, having found with Belgian hares that citrate of iron and ammonia (0.7 gm. daily) is effective in overcoming and in preventing cottonseed meal intoxication. Further experiments are in progress with small animals and with swine. Efforts to isolate the toxic substance will be continued.

Fishing for Sharks in Key West Harbor: E. W. GUDGER, State Normal College, Greensboro.

In this paper the capture was described of a 7-foot 10-inch male specimen of *Hypoprion brevirostris* and a 10-foot 10-inch female specimen of the tiger shark, *Galeocerdo tigrinus*, in Key West Harbor, in July, 1912. These two fishes not being very well known, it is proposed later to publish careful descriptions with exact measurements.

The jaws of the tiger shark, which were exhibited, measured 1 foot 4 inches straight across, and around the curve of the jaws 1 foot 9 inches. Its stomach contained more than a half barrel of miscellaneous material, including a cow's head (dehorned) minus the lower jaws, the vertebral column of a sheep, the scutes of a green turtle, the bones and feathers of two birds and a lot of tin cans and sea weed. The uteri were dissected, but unfortunately the fish was not in breeding condition.

A Second Capture of the Whale Shark, Rhineodon typus, in Florida Waters: E. W. GUDGER, State Normal College, Greensboro.

This paper will be published in full in SCIENCE. For the following papers no abstracts have been received:

"Some Possible Effects of Solar Rays," George W. Lay, St. Mary's School, Raleigh. (Read by title.)

"Seasonal Periodicity in the Water Moulds," W. C. Coker, University of North Carolina, Chapel Hill.

¹ *Proceedings Society for Promotion Agricultural Science*, 1912, pp. 19–21, and *Journal of Biological Chemistry*, Volume XIV. (1913), pp. 53–58.

"Vaccination against Tuberculosis," C. A. Julian, Thomasville.

"The Geological History of Western North Carolina," J. H. Pratt, State Geological Survey, Chapel Hill.

"Action of Ammonia upon Arsenic Iodide," C. H. Herty and J. T. Dobbins, University of North Carolina, Chapel Hill.

"A List of the Known Homoptera in North Carolina," Z. P. Metcalf, Agricultural and Mechanical College, West Raleigh.

"The Chestnut Bark Disease," S. C. Bruner, Agricultural and Mechanical College, West Raleigh.

"Serum-simultaneous Method of Immunizing Hogs against Cholera," W. C. Chrisman, State Department of Agriculture, Raleigh.

"Behavior of the Spermatozoa of the Crab," Raymond Binford, Guilford College.

"The Granville Tobacco Wilt Problem," H. R. Fulton, Agricultural and Mechanical College, West Raleigh. (Read by S. C. Bruner.)

"The Swamp Lands of Eastern North Carolina," J. H. Pratt, State Geological Survey, Chapel Hill.

"The Influence of Environment on Reproductive Processes," W. C. Coker, University of North Carolina, Chapel Hill.

"Survivals and Adaptations along the South Atlantic Coast: A Study in Anthropogeography," Collier Cobb, University of North Carolina, Chapel Hill. (Read by title.)

"A New Interference Apparatus" (with a demonstration), C. W. Edwards, Trinity College, Durham.

"The Closing Up of Lake Basins in Massachusetts, Michigan and North Carolina," Collier Cobb, University of North Carolina. (Read by title.)

E. W. GUDGER,
Secretary

STATE NORMAL COLLEGE,
GREENSBORO, N. C.

SOCIETIES AND ACADEMIES

THE ACADEMY OF SCIENCE OF ST. LOUIS

At the meeting of the academy on March 3, Dr. R. J. Terry, of the Washington University Medical School, read his second paper on "The Development of the Cranium in Mammals."

Dr. Terry stated that Weiss's study of the occipital region of embryos of white rats revealed the fact that the dens epistrophei in these animals is composed of two elements, the one generally

recognized as comparable with a centrum for the atlas, the other lying cephalad of this and forming the extremity of the dens. The latter is derived by independent chondrification in the tissue about the notochord cephalad of the atlas and where the former crosses the dorsal surface of the basal plate of the cranium. Weiss regarded this cephalic element as representing the centrum of an occipital vertebra or a proatlas.

The presence of an element in the dens epistrophei of cat embryos has been observed developing cephalad of the component identified as the centrum of the atlas and extending upon the basal plate of the cranium. This component is derived from the mesenchyma which, in the form of a cone traversed by the notochord, extends from the level of the atlas cephalad upon the basal plate and there lies in a deep median groove. Chondrification in this part of the dens occurs later than in that part related to the atlas, but the two processes appear not to be entirely distinct.

At the meeting of April 21 Professor R. A. Hall, of Washington University, stated to the academy that he had succeeded in preparing neutral tri-ammonium citrate in commercial quantities.

Professor Hall described a method in which neutral tri-ammonium citrate was prepared by passing an excess of dry ammonia gas into a well-cooled solution of the water-free citric acid in an anhydrous solvent.¹ The yield is quantitative. Tri-ammonium citrate thus prepared is a stable, white crystalline substance, not hygroscopic and not affected by the CO₂ of the atmosphere. It dissolves readily in water and the freshly-prepared solution is neutral to sensitive litmus, azolitmin, corallin, methyl red, etc. Rigorous analyses of both the ammonia and the citrate content of the salt show it to be the tri-ammonium citrate. Further investigation of its physical-chemical properties is being made.

As the method of preparation is simple and inexpensive and the yield good, it is evident that this means a solution of the difficult problem of the fertilizer chemist in the preparation of neutral ammonium citrate solution for the determination of the insoluble phosphoric acid in fertilizer analysis.

G. O. JAMES,
Corresponding Secretary

¹This body was first prepared by this method two years ago at the time of the investigation of the conductivity method of preparing neutral ammonium citrate solutions, but a press of other research prevented its analysis and complete identification until the present time.