at this place and hence receives the full wash of the Sound's waters from each tide. The numerous quantities of igneous rocks in the channel and the rapidly moving water makes this location an ideal "field" for the growing of *Nereocystis luetkeana*. At low tide the beach is strewn with seaweed along with a few other, but smaller, varieties.

The stems and leaves are covered with a slimy coating from one sixteenth to one eighth of an inch in depth, and composed of algæ and other microorganisms. This covering acts as a protective coating to the seaweed while it lies exposed to the sun's radiations during low tide. Many of the leaves, twelve to twenty feet long and sixteen to twenty inches in width, develop light yellow spots with a filmy texture sometimes covering large portions of the leaves. The chlorophyl disappears entirely from these spots and does not apparently reappear as such upon submergence during the incoming tide. Upon close examination it is found that the slimy covering mentioned above has dried completely over the bleached spots, and in many instances there is none of the dried film present, suggesting that the slimy covering had been removed mechanically by wave motion, etc.

One would be at a loss to explain this discoloration of green coloring-matter in the seaweeds was it not for the strong odor of bromine in the vicinity where this bleaching was in progress, especially after the sun had radiated upon the beached plants for an hour or more. The "stench" of the fumes as being due to bromine is unmistakable to those who are at all familiar with the element. The presence of the bromine in the air about these localities must be due to the action of photo-chemical or microorganic processes upon the combined bromine and other halogens present in the seaweed. The liberation of small amounts of the halogens in the presence of the chlorophyl undoubtedly causes its discoloration.

In order that it might be determined whether or not the bromine existed in combination within the seaweed, several large *Nereocystis* (stems and leaves intact) were secured, washed, dried and ashed. The ashes gave a strong test for both bromine and iodine.

From the qualitative test one would expect the quantity of bromine to be equal to, if not greater than, the iodine content in the same ash. The ashes from *Nereocystis* secured at different times were kept on hand and given to the students for analytical determinations, viz., sodium, potassium, chlorine, bromine and iodine.

Two large *Nereocystis luetkeana* yielded upon quantitative examination the following substances expressed in per cent. of dry weight of material:

	K_2O, Per Cent.	I, Per Cent.	Br, Per Cent.
No. 1	22.3	0.30	0.19
No. 2	24.7	0.23	0.11

Though not going into detail as to the methods used in analysis (a detailed analysis will be reported in one of the chemical journals) I might say that standard procedures were followed.

It appears that the bromine should be both recoverable and merchantable in view of the present prices of this commodity.

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THE NORTH CAROLINA ACADEMY OF SCIENCE

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THE North Carolina Academy of Science met in annual session at the Agricultural and Mechanical College, Raleigh, on Friday and Saturday, April 28 and 29, 1916. The executive committee had a meeting on Friday afternoon, and after this there was a session for the reading of papers. At night President D. H. Hill, of the college, delivered an address of welcome and then President A. S. Wheeler, of the academy, gave his presidential address, "The Critical Dyestuff Situation," with a demonstration of materials. Next Professor E. W. Gudger read a paper entitled, "The Remora or Echeneis; A Living Fish-hook," illustrated with specimens and photographs.

On Saturday morning at 9 the annual business meeting of the academy was held. The secretary-treasurer made his report, which showed the finances of the academy to be in good condition with a comfortable balance in savings bank. The various stated committees made their reports. An invitation to hold the 1917 meeting at the University of North Carolina, at Chapel Hill, was accepted. Twenty-three new members were elected and two former members reinstated, bringing the total membership up to 88.

The following officers were elected for 1916–17.

President—F. P. Venable, University of North Carolina, Chapel Hill.

Vice-president—H. C. Beardslee, Asheville School for Boys, Asheville.

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

Additional members executive committee—J. E. Smith, University of North Carolina, Chapel Hill; E. O. Randolph, Elon College; Bert Cunningham, City High School, Durham.

At the close of the business session a joint meeting was held of the academy and of the North Carolina Section of the American Chemical Society, at which papers of interest to both bodies were read. Following these the chemists and the academy held separate meetings to complete the reading of papers on their respective programs. The academy adjourned at 1:30 P.M. The total attendance was 43 out of a membership of 86. There were 23 papers on the program, of which only 3 were read by title. Including the presidential address, which will be published in the current number of the *Journal of the Elisha Mitchell Scientific Society*, the following papers were presented:

Observed Changes in the Land Vertebrate Fauna of North Carolina: C. S. Brimley.

Notes the known changes in the abundance and distribution of certain birds, mammals and reptiles in North Carolina. The full paper is published in the current number of the *Mitchell Journal.*

Two Raleigh Amblystomas: C. S. Brimley.

Compares briefly the species of *Amblystoma* occurring at Raleigh, *A. opacum* and *A. punctatum.*

The data for these is given in full in the proceedings published in the *Mitchell Journal.*

Aristotle's Echeneis not a Sucking-Fish: E. W. Gudger.

The identity of this fish was discussed and data presented to show that it was a goby, while evidence was adduced that the "dolphin's louse," elsewhere referred to by Aristotle in his *History of Animals,* was a sucking-fish.

The Echeneis or Remora; a Living Fish-hook: E. W. Gudger.

The tendency of this fish to adhere to turtles, sharks or any large fish by means of its cephalic sucking disk, is made use of in many parts of the world to render easy the catching of fish. A thin cord is tied around the "small" of the tail of the fish and it is set free in the water. Finding a turtle or fish, the fisherman-fish clamps itself fast to it, and both are hauled in by the fisherman. This use of the living fish-hook was traced back to 1494, when Columbus (the first European to see it so used) witnessed its exploits on the south side of Cuba on his second voyage. The paper was illustrated by numerous photographs of illustrations in old books, showing this use of the fish. The completed paper will be published later.

Some Interesting Mushrooms: W. C. Coker.

Several species new or rare in North Carolina were shown, with photographs and paintings.

Naucoria sp. A species of this genus, not recorded from this state, has appeared in manured soil in the arboretum of the university for several years. It is of good size and very resistant to decay, and was tested and found harmless, and if the bitter gills are removed makes a very pleasant dish. As it appears very early in the season, during April, and before other species of any size are out, it is a valuable addition to our list of edibles. The species seems nearest *N. hamadryas,* but differs from it in some respects.

Clavaria spiculispora Atkinson. A painting of this species was shown. It was described from our collections of Chapel Hill plants. It is remarkable for the very deep brown color (deepest of any other American Clavaria), and the very long spicules on the spores. We have since found it in the mountains near Black Mountain. It is not known except from this state.

Amanita chlorinosma Pk. Photographs and paintings were shown to illustrate the great range in size and color of this species. White, greenish, salmon, reddish and ashy-brown forms occur. All the forms have a distinct odor of chlorine.

Nyctalis asterophora Fr. A photo was shown of this plant growing on *Russula nigricans.* It is very peculiar in having another mushroom for its host, and in the degenerated gills. The functional spores are not borne on the gills as usual, but on the cap as a fine powder, and are very large and irregular.

Venereal Infections in Animals: G. A. ROBERTS.

Observations, investigations and reports indicate very wide-spread venereal infections in this country and abroad among domestic animals, horses, cattle, sheep, swine, etc. Such infections have been known to exist in the human family for a long time.

Few people have recognized the extent and manifold results of these infections.

The most extensive investigations and the greatest losses, direct and indirect, in animals have been among dairy cattle and breeding herds.

The specific organism responsible for the infections in cattle has all but universally been accepted as the *Bacillus abortus* (Bang). Many cases of infection with the *B. abortus* are too mild to produce clinical symptoms. The results observed in many such infections, however, are: abortions, including premature births, still births and births of weaklings; metritis (inflammation of the uterus); and sterilities, temporary and permanent.

Retained "after-birth" is quite common in cattle when expulsion of the fetus occurs during the latter half of pregnancy, owing to the peculiar attachment between the fetal membrane and the uterus at the time.

Nymphomania is not uncommon in cows and mares.

The relation of this organism to certain udder diseases and the granular venereal disease of cattle, to some forms of calf scours and infant diarrheal troubles, has not been determined, but is suspicious of a close relationship.

Resistance and Immunity in Plants: F. A. WOLF.

This paper contains a brief summary of the facts which have been correlated with resistance and immunity in plants in attempts to explain the underlying causes. Attention is called to several investigations dealing with morphological differences between susceptible and immune varieties. Consideration is also given to the influence of mineral nutrients in the soil upon resistance. The discussion also includes those causes which reside within the protoplasm of the host plants such as differences in acidity, tannin content, etc., of susceptible and immune varieties. It is believed that too little attention has heretofore been given to the inherent characters of the parasitic organism which determine the virulence of the parasite.

Some Methods of Making Lantern Slides: Z. P. METCALF.

The need of some form of projection in science teaching and the general utility of lantern slides was emphasized. Two methods of making lantern slides were discussed and examples of various kinds of lantern slides were shown.

Trees and Shrubs of Chapel Hill: H. R. TOTTEN.

There are seventy-two species of native trees found in the Chapel Hill neighborhood. In this number there are fourteen oaks: *Quercus alba* L., *Q. stellata* Wang., *Q. lyrata* Walt., *Q. Michauxii* Nutt., *Q. prinus* L., *Q. ruba* L., *Q. palustris* Muench., *Q. velutina* Lam., *Q. falcata* Michx., *Q. pagodaefolia* (Ell.) Ashe, *Q. marilandica* Muench., *Q. nigra* L., *Q. phellos* L. A hybrid, probably between *Q. phellos* L. and *Q. falcata* Michx., is also found. This is the only station for the Pin Oak (*Q. palustris*) in North Carolina. There are seven hickories: *Hicoria ovata* (Mill.) Britton, *H. carolina-septentrionalis* Ashe, *H. microcarpa* (Nutt.) Britton, *H. glabra* (Mill.) Britton, *H. pallida* Ashe, *H. alba* (L.) Britton, and *H. cordiformis* (Wang.) Britton.

There are sixty native shrubs. A few of the most interesting are: *Nestronia umbellata* Raf., *Hydrangea arborescens* L., *Euonymus atropurpureus* Jacq., *Ascyrum stans* Michx., *Rhododendron catawbiense* Michx., *Fothergilla major* Lodd., *Robinia nanna* (Ell.) Spach., *Gaultheria procumbens* L., *Gaylussacia baccata* var. *glaucocarpa* (Robinson) Mackenzie, and *Symplocos tinctoria* (L.) L'Her.

On the Sexuality of the Filament of Spirogyra: BERT CUNNINGHAM.

If zygotes occur in both filaments as the result of scalariform conjugation, the filament is said to be bisexual. This condition is called cross conjugation. All cases reported thus far have been considered as abnormalities on account of their rareness. The writer collected a species in cross conjugation in April, 1915. It has been tentatively identified as *S. inflata.* Professor G. S. West verifies this classification. This shows that bisexuality of the filament does occur in the genus. Bisexuality is due to retarded reduction. In scalariform conjugation reduction occurs in the zygote with the loss of three nuclei, while in lateral and cross conjugation, reduction takes place in the filament and no nuclei are lost. The essential difference between lateral and cross conjugation is that the cells may continue to divide after reduction in the latter, while they do not in the former. In this respect the filament of *Spirogyra* which cross conjugates is homologous with the sporophyte of higher plants.

The Diorites of the Chapel Hill Stock: JOHN E. SMITH.

The specimens described here were obtained along Bolin's Creek. Some were taken near the inner margin of the zone and some near the creek at the foot of Clover Hill. The primary minerals as shown by the microscope are oligoclase, hornblende, quartz, magnetite and apatite named in order of their abundance. The apatite occurs as inclusions. The oligoclase contains innumerable, minute inclusions occupying most of the area of the crystals except in the narrow marginal zone which are entirely free from them. The parallel striations are in general very narrow and very close together and in some of the zones are invisible. The order of crystallization is as follows: apatite, magnetite, hornblende, oligoclase and quartz. The secondary minerals are epidote, and a small quantity of albite. They are derived from the oligoclase, magnetite and hornblende by hydration.

The quartz decreases in amount outward from the center of the stock. The lime in the water supply of Chapel Hill is produced from this feldspar. The soils derived from the rocks of this zone constitute the Iredell series and contain little or no potash.

Physiography of the Isle of Palms (S. C.): E. Oscar Randolph.

The Isle of Palms, situated eight miles to the northeast of Charleston, and connected with that city by a trolley line, has an area of approximately 4,000 acres. This sea-captured land is about six and one fourth miles in length, and one and one fourth miles in maximum width, tapering to a decided point at the southwestern end. Physiographically this area is interesting and instructive. In shape it approximates a ham; and by local fishermen it is called "the ham."

From the mainland the island is separated by a narrow inlet that is wide and deep enough to convey local freight-, pleasure- and fishing-vessels. This back beach is subjected to no unusual geological agencies except tidal work. The front beach is subjected to wave, tidal, wind and littoral current agencies. As a result, frequent shoreline configurations are effected. The writer made a number of instructive observations relative to immediate changes of epicontinental shelving between the points of high and low tide respectively.

Two well-defined sand dune ridges traverse the island lengthwise. Physiographically, incipient, migratory, temporary and fixed dunes are in evidence. Among the flora are found sand arresters and dune fixers. The front beach is continuously attacked by wind and wave action; the interdune area is likewise undergoing change under the influence of wind-trough currents and animal life. The age and stability of the fixed dunes, ranging in height from twenty-five to forty feet, is realized in their supporting luxuriant palm trees.

Alternation and Parthenogenesis in Padina: James J. Wolfe.

At the meeting of this academy in 1913, the writer made a preliminary report on this work. It had then been carried only to the point of demonstrating that tetraspores invariably produce male and female plants. The entire series has now been completed, showing with equal certainty that fertilized eggs produce only tetrasporic plants—thus demonstrating "alternation of generations" in *Padina*.

In view of the fact that *Padina* grows well only in localities where it normally occurs, in the experiments dealing with parthenogenesis, clean oyster shells were attached alongside those bearing unfertilized eggs to serve as controls. The results of both series were in essential respects sufficiently similar to show that all plants recovered were in both cases derived from chance reproductive bodies. Thus, it is fairly conclusively shown that unfertilized eggs, though they germinate quite freely parthenogenetically, never produce mature plants.

No abstracts have been received for the following papers:

"Friday Noon," by George W. Lay.

"Zonation in the Chapel Hill Stock," by Collier Cobb.

"*Russula xerampelina;* a Study in Variation," by H. C. Beardsley.

"Improvements in the Method of Determining the Heating Value of a Gas," by C. W. Edwards. (By title.)

"Magnetic Separation of Minerals," by Joseph Hyde Pratt.

"Insect Polyembryony," by R. W. Leiby. (Lantern.)

"An Apparatus to Illustrate the Cohesion of Water—with Reference to the Ascent of Sap," by F. E. Carruth. (By title.)

"Some Recent Feeding Experiments with Cottonseed Products," by W. A. Withers and F. E. Carruth. (By title.)

"A Study of Some Nitrifying Solutions," by W. A. Withers, H. L. Cox, F. A. Wolf and E. E. Stanford. (By title.)

"A New Industry for North Carolina," by C. P. Williams. (By invitation.)

E. W. Gudger,
Secretary