









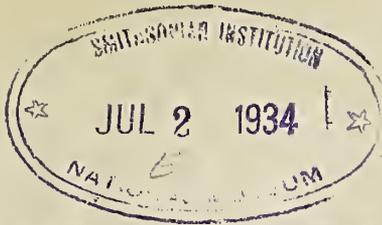


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BULLETIN

Volume IV

SEPTEMBER, 1935  
Herbert C. Moore, Editor

Number 1

TYPES OF INDIAN IMPLEMENTS FOUND IN MARYLAND

BY RICHARD E. STEARNS

In pre-Columbian days Tidewater Maryland was a favorite location for Indian settlements inasmuch as the shores abounded with game and the waters contained food in great quantities. Usually it is not difficult to find the former sites of these villages - the Indians' fondness for the oyster resulted in shells being piled in heaps or strewn over the ground where they may be still seen.

The antiquities found in these shell fields are fairly numerous, comprising pottery fragments, arrow points, grooved axes and celts, gorgets and bannerstones, pestles, mortars, fragments of steatite vessels, and rarely, pipes.

Many clay vessels were used by the Tidewater Indians. In fact, more pottery fragments are found in the shell heaps than any other clay vessels are practically never found. Complete vessels are practically never found. size from small vessels ones with a capacity of made of red clay and bore the rims. Sometimes entirety may be discerned fragments. Cord impres- quin pottery covered the remainder of the vessels. Suspension holes were placed at intervals. Figure 1 illustrates a typical pot.

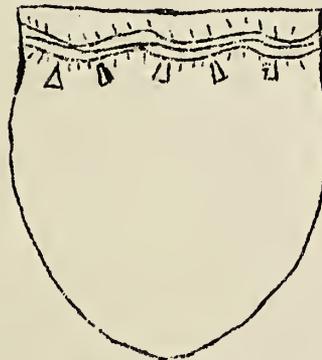
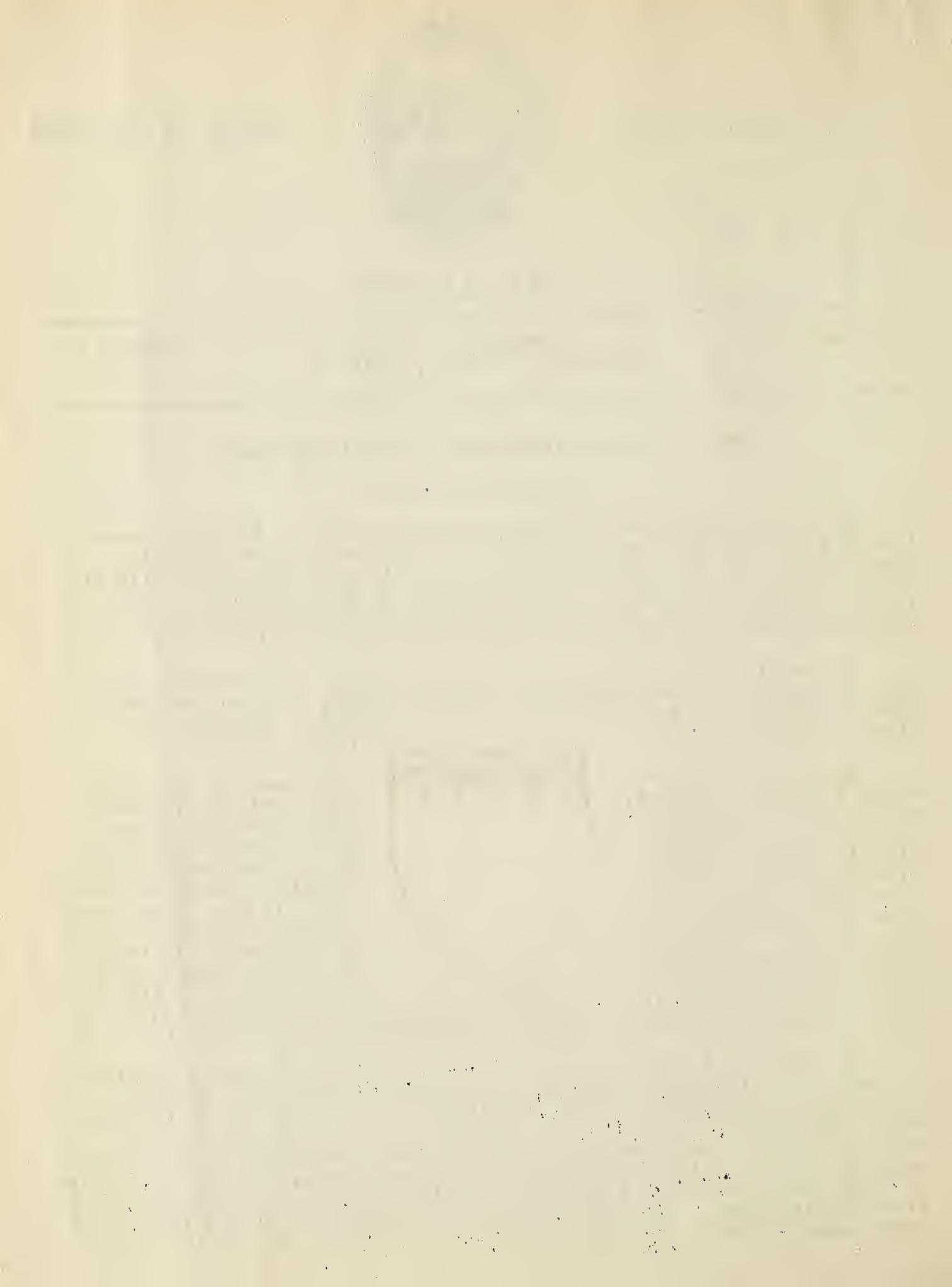


Figure 1

were used by the Tidewater Indians. In fact, more pottery fragments are found in the shell heaps than any other clay vessels are practically never found. Complete vessels are practically never found. size from small vessels ones with a capacity of made of red clay and bore the rims. Sometimes entirety may be discerned fragments. Cord impres- quin pottery covered the remainder of the vessels. Suspension holes were placed at intervals. Figure 1 illustrates a typical pot.

The principal types of arrow and spear points found in Maryland are shown in Figure 2. They were usually made of quartz, quartzite, or rhyolite, very little flint of finer quality being found in Maryland. Rhyolite was quarried at South Mountain, near what is now Maria Furnace, Pennsylvania, not far from the Maryland line, and then carried to the villages around the Chesapeake Bay. Points and spears of jasper are sometimes found too, and this material was also brought from Pennsylvania. The points of quartz which were flaked from water worn pebbles seldom exceeded two and a half inches in length. The



rhyolite, a blue gray volcanic stone, was quarried from the massive rock. Consequently, the larger types were made of this material, some measuring up to a foot in length.

Grooved axes and celts were made from boulders of tough sedimentary rock. These implements were pecked into shape with hammerstones and finished by grinding with an abrasive rock such as sandstone. A vine or other tough pliable wood was looped around the groove of an ax, after which the two ends were bound together forming the handle. The celt, which had no groove, was inserted in a hole in the end of a club. (See Figure 3).

At various places in Maryland, notably the Patuxent River above Laurel, occur outcrops of steatite. This stone was quarried by the natives for the manufacture of cooking vessels. At all the quarries visited by the writer, the Indians' work is apparent in the shape of shallow pits and heaps of debris. The pits are almost obliterated by leaves and earth washed in over a period of many, many years.

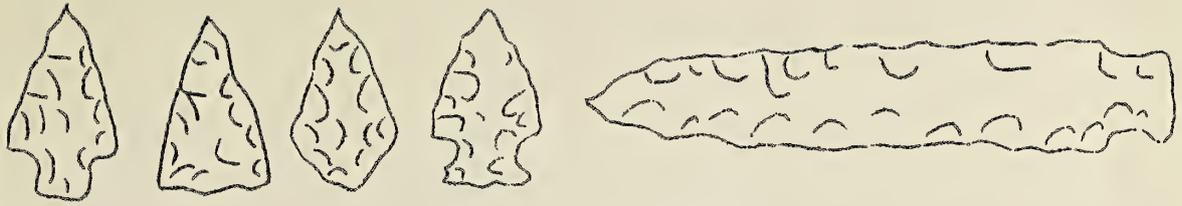
In the heaps of debris or lying nearby on the ground the archaeologist may find fragments of vessels which were broken during their manufacture. They averaged a foot or two in length and were hewn out of the solid rock with chisels of stone. Very few finished vessels will be found as they were carried to the villages, some of them a considerable distance away. A finished steatite vessel and stone chisels are shown in Figure 4. For campfire use steatite vessels were superior to those of clay since they were able to withstand heat far better.

The other implements to be described are those showing the highest type of Indian workmanship - bannerstones, gorgets, and pipes. Bannerstones are found sparingly all over the Tidewater Country but are more numerous at the head of the Bay and at Conowingo. Usually they were made of slate or steatite and were pecked into shape and finished in the same manner as were axes. Holes were drilled with a wooden drill, probably with the use of sand as an abrasive. The rotating marks of the drill are plainly evident.

Many theories have been advanced as to the use of bannerstones, the best one being that they were used as badges of office. Figure 8A, from the Annual Report of the Bureau of Ethnology, 1890-91, shows a part of a figured copper plate from the Etowah group of mounds. This headdress suggests the round winged type of southern bannerstones. Figure 8B illustrates a bannerstone found with a stone handle in the Tennessee-Kentucky district. Types of Maryland bannerstones are shown in Figure 5.

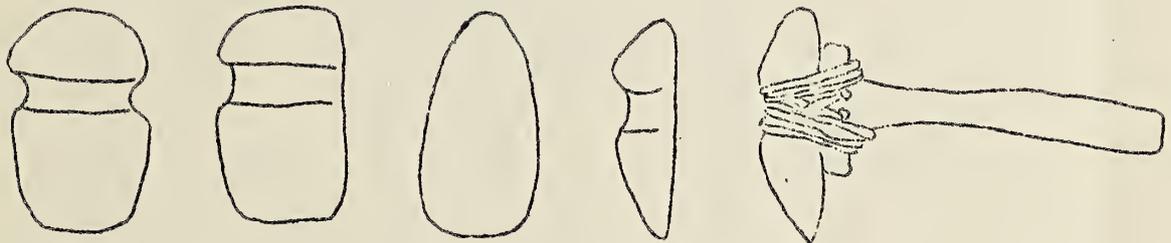
Gorgets are flat tablets of slate with one or more holes bored in the center. They were probably used on a necklace or as wrist ornaments. Specimens have been found in Indian graves over the breastbone and at the wrists. Three types are shown in Figure 6.





Chipped Implements

Figure 2

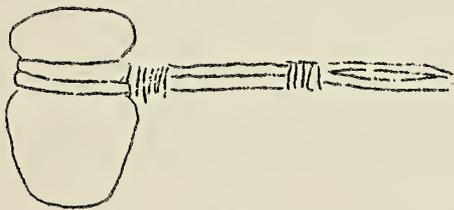


Grooved Axes

Celt

Adz

Adz

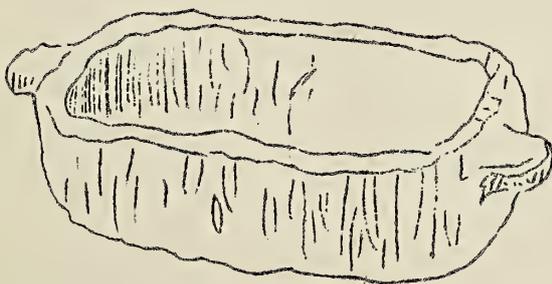


Ax

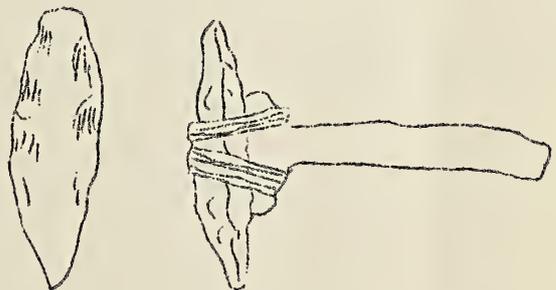


Celt

Figure 3



Steatite Vessel



Chisels

Figure 4



Pipes are not often found in Maryland, only three broken specimens of clay being in our collection. Two of these are pictured in Figure 7. The upper one from Conowingo is a typical Iroquois pipe.

(In a later number of the Bulletin Mr. Stearns will describe many of the localities in Maryland where he has found Indian artifacts.)



Figure 5

Figure 6

Figure 8

(Figure 8A - From the Annual Report of the Bureau of Ethnology, 1890-91)



Figure 7

Figure 9

(Figure 9 illustrates Indians hollowing a log canoe by the use of fire and the stone adz. This latter implement resembles a grooved ax, but the cutting edge is at right angles to the handle. The probable manner of hafting this implement as well as the grooved ax and celt is shown in Figure 3.)

The first part of the drawing shows a vertical stem with three oval shapes stacked vertically. To the right of this stem is a tall, thin stem topped with a flat, umbrella-like structure. Further right is a more complex, branching structure with several rounded, bulbous parts. To the far right are three more oval shapes stacked vertically.



Figure 1

Figure 2



Figure 3

The second part of the drawing shows a vertical stem with a rounded top and a small, curved structure extending from it. To the right of this stem is a small, curved structure. Further right is a larger, more complex structure with a rounded top and a small, curved structure extending from it. To the far right is a large, rounded, bowl-like structure.

Notes on the Miocene Formation of Maryland

By Elra M. Palmer

(This is one of a series of miscellaneous notes by the Curator of the Department of Paleontology).

Remains of Teleost fish in the Miocene deposits are few and comparatively rare. One reason for this may be due to the fragile texture of the bone structure of these fish.

Otoliths of Teleost fish were found about one mile south of Plum Point Wharf, Calvert County, Maryland. These specimens were found in the Calvert Formation of the Miocene. The specimens collected measured:

Cat. No. C 583 - Width-4mm.; Length 6 mm.; Max. thickness 1mm.

Cat. No. C 583.1-Width-4mm.; Length 5 mm.; Max. thickness 1mm.



(An Otolith is frequently called an "ear bone." It is usually a concretion of Calcium Carbonate ( $\text{Ca CO}_3$ ) and Calcium phosphate ( $\text{Ca}_3(\text{PO}_4)_2$ ) found in the auditory organ of many invertebrates and in the internal ear of the vertebrates).

1 Inner 2 Outer 3 Side

Views of Otolith of  
Teleost Fish (X2)

The only other fossil remains of Teleost fish which the department has in its study collection were collected by Mr. Roger S.

Hecklinger in August, 1928. The remains consist of two vertebrae found in the Calvert Formation, about three-quarters of a mile south of Plum Point Wharf, Calvert County, Maryland.

Notes

Exhibits - Two exhibits were held during the month of September, one at the Enoch Pratt Library from the eleventh to the thirtieth, and the other at the store of the Gault Marble Company from the eleventh to the twenty-seventh. At the Library a series of nature prints depicting the turkey buzzard from the egg to the adult were on display. The photographs were taken from life by Edward McColgan and W. Bryant Tyrrell of the Department of Ornithology. Previous to the exhibit, the photographs appeared in the Photogravure Section of the Baltimore Sunday Sun.

The exhibit at the Gault Marble Company consisted of a series of Indian artifacts from the Department of Archaeology.

Staff Meeting - The semi-annual meeting of the Staff was held on September 15th. The meeting was called to formulate new plans for the coming season and to interchange ideas helpful to the Departments.



Weekly Talks - A series of weekly talks by members of the various Departments has been inaugurated. These talks, to be given on assembly nights other than the monthly lecture, are to last fifteen minutes each.

The first talk was given on September 5 by Mr. Fladung who chose as his subject "The Organization, History, and Aims of the Society." He discussed the history of the Society, its aims (which embrace a large part of our present program), the position of the Board of Trustees as an active body of men who follow closely the business and scientific affairs of the organization, and the natural history work of the Staff which consists of members who constitute the real working part of the Society.

On September 12, Mr. Elra M. Palmer presented a brief address on "The Functions and Operation of the Department of Education," of which he is the Curator. Mr. Palmer discussed the lecture and exhibition work of his department - in the Society as well as in schools, churches, clubs and other organizations. Also he explained the operation of the Junior Division.

Mr. F. Stansbury Haydon, Curator of the Department of Entomology, gave on September 19 a short demonstration and talk. Mr. Haydon mounted specimens of the Orders Coleoptera and Ornithoptera, describing at the same time the reasons for his procedure.

On September 26, Mr. A. Llewellyn Jones chose as the subject of his talk "The Department of Mineralogy." The program for this new department, of which Mr. Jones is Curator, was outlined.

Paleontology - The Staff of the newly created Department of Paleontology had its first meeting on September 10. This department and the Department of Mineralogy constituted the old Department of Geology which the Board of Trustees recently divided. A definite plan of operations was adopted and assignments were made.

Junior Meeting - The monthly meeting of the Junior Division was held on September 23. Robert Wheeler and Richard Webster were made Junior members. The former gave a talk on "The Evolution of the Pearly Nautilus," while the latter spoke on "Some Noxious Insects of Maryland." Both talks were illustrated by specimens and drawings.

An Archaeological Find - Mr. Richard E. Stearns, Assistant Curator of the Department of Archaeology, recently unearthed in Anne Arundel County about 300 fragments of a large specimen of Indian pottery. This bowl, now being restored in part, will certainly prove to be one of the largest ever found in Maryland. It will be described more fully at a later time.

THE HISTORY OF THE UNITED STATES

CHAPTER I  
THE DISCOVERY OF AMERICA

The first discovery of America was made by Christopher Columbus in 1492. He sailed from Spain in search of a westward route to the Indies. On October 12, 1492, he landed on the island of San Salvador in the West Indies. This event marked the beginning of European exploration and settlement in the Americas.

CHAPTER II  
THE EARLY YEARS

The early years of the United States were marked by the struggle for independence from Great Britain. The American Revolution began in 1775 and ended in 1783. The Declaration of Independence was signed on July 4, 1776, and the Constitution was adopted in 1787.

CHAPTER III  
THE GROWING NATION

The growing nation of the United States faced many challenges in the early 19th century. The War of 1812 was fought against Great Britain, and the Louisiana Purchase of 1803 significantly expanded the territory of the United States.

CHAPTER IV  
THE CIVIL WAR

The Civil War, fought from 1861 to 1865, was a pivotal moment in American history. It was fought between the Union and the Confederacy over the issue of slavery. The war resulted in the preservation of the Union and the abolition of slavery.

CHAPTER V  
RECONSTRUCTION

Reconstruction was the period following the Civil War, during which the Southern states were reintegrated into the Union. It was a time of significant social and political change, as the rights of African Americans were being established.

CHAPTER VI  
THE WESTERN FRONTIER

The Western Frontier was a period of exploration and settlement in the western United States. It was a time of great adventure and discovery, as pioneers sought new opportunities and resources.

CHAPTER VII  
INDUSTRIALIZATION

Industrialization was a period of rapid economic growth and technological advancement in the United States. It was a time when the nation became a major industrial power, and the standard of living improved for many.

CHAPTER VIII  
IMPERIALISM

Imperialism was a period of expansion and acquisition of overseas territories by the United States. It was a time when the nation sought to establish a global presence and influence.

CHAPTER IX  
THE GREAT DEPRESSION

The Great Depression was a period of severe economic hardship and unemployment in the United States. It was a time of great suffering and struggle, but it also led to the implementation of New Deal policies that reshaped the nation.

CHAPTER X  
THE SECOND WORLD WAR

The Second World War was a global conflict that resulted in the defeat of the Axis powers and the emergence of the United States as a superpower. It was a time of great sacrifice and heroism, and it shaped the world as we know it today.

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*The Natural History*



*Society of Maryland*



## BULLETIN

Volume IV

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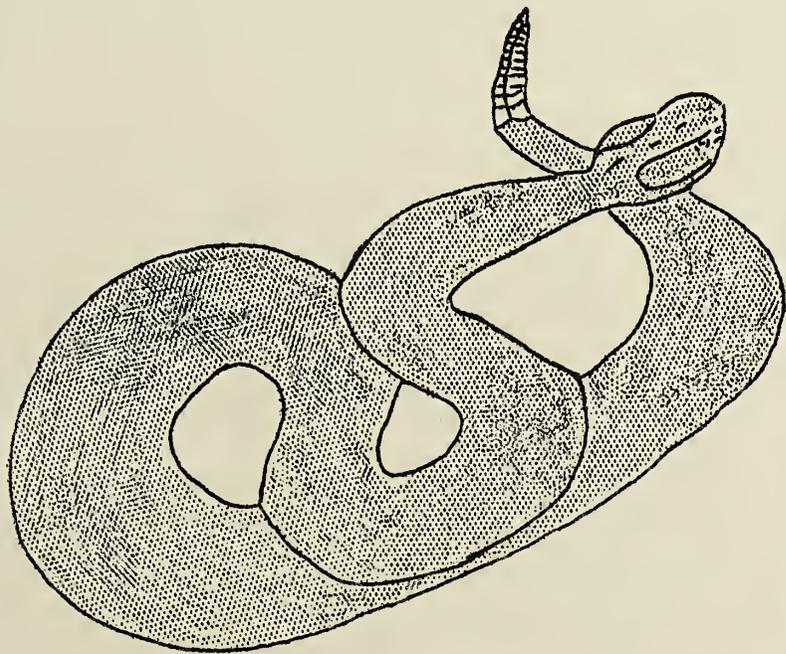
Number 2

### FANGS OF MARYLAND PIT-VIPERS

BY HARRY C. ROBERTSON

Maryland is inhabited by two pit-vipers, the copperhead snake (*Agkistrodon mokasen*) and the timber rattlesnake (*Crotalus horridus*). The term "pit-viper" refers to a small cavity in the loreal region just before the eye. It is heavily innervated, but what the function of this cavity may be is not entirely understood.

Many people believe poisonous serpents sting in some manner and often mistake the forked tongue for the "sting" or poison injecting equipment. It should be clearly understood that poisonous serpents do not possess a "sting" either in their mouths or in the end of their tails.



Dark phase of Timber Rattlesnake - *Crotalus horridus*



They do, however, possess a highly developed poison apparatus used for obtaining food and as a weapon for defense. It is efficient in both cases. A general outline of this equipment follows.

The poison apparatus consists of a pair of hollow teeth in the anterior part of the upper jaw. A duct which connects at the base of these hollow fangs runs back to the gland. This duct, passing the fang and turning upon itself, is closely applied to an opening on the anterior face of the upper end of the fang. Figure 2 illustrates the location of these organs. When not in use the fangs which are on a movable bone lie flat against the roof of the mouth as illustrated in Figure 3.

The poison is derived from the almond-shaped glands which lie above the lip margin. By the compression of a ligament the poison is forced out through the duct down through the fang. The poison is a thick yellowish fluid which, when extracted and sealed in a container, retains its toxic properties for years.

Both the copperhead and rattlesnake strike forward with terrific speed and force, driving the fangs deep into the flesh of the victim, after which they are immediately withdrawn. This action often causes the loss of one or both of the fangs. Reserve fangs graduated in size down to the tiny tooth germ lie in a fold of flesh behind the principal fangs, so that the serpent has another pair in a short time. This explains why such serpents can not be made permanently harmless by the removal of the fangs.

Almost in every case these snakes strike from a coil or an S-shaped loop. They do not have to be coiled to strike however.

In addition to the fangs these serpents are provided with short solid teeth which are not poison conductors and which are useful only to hold the prey about to be swallowed.

The bite of one of these serpents should be met with the proper first aid treatment at once and then the patient should be taken as soon as possible to a doctor. Anyone badly bitten will find the only first aid treatment that can be relied upon is the removal of the venom by mechanical suction. Kits containing this suction equipment along with full directions are now on the market. It is more logical to remove the venom in this manner than to try to neutralize it once it has gotten into the circulation, for this type of poison acts directly upon the blood, breaking down the red blood cells and destroying the walls of the carrying vessels. Anti-venin serum, used to neutralize poison that has already gained way in the circulation, is important however, and it is advisable when possible to follow up the mechanical suction treatment with the serum. On the other hand, immediate use of the suction equipment would insure recovery without the use of the expensive anti-venin. In case of emergency, a companion (or the victim himself) may suck the wound, spitting out the venom, but this is very dangerous if there are sores in his mouth.



Old fashioned treatments such as kerosene, whiskey, and poultices to draw off the poison are not effective. Those who claim to have been cured by such methods would have recovered anyway. Occasionally the rattler or copperhead when striking does not inject much or any venom beneath the skin. Also some of the venom may be absorbed by clothing, making the bite much less dangerous. It is in such cases that the so-called remedies appear to be reliable cures.

Recent experiments conducted in Texas have shown the worthlessness of most of the old treatments for snake bite. It was proven also that potassium permanganate, magnesium sulphate, chloral hydrate, and alcohol, as well as other chemicals were not to be depended upon. The experiments were performed on dogs and only those treated with the suction equipment recovered.

(Mr. Robertson, who for some time has been studying the habits of Maryland snakes, especially some eighteen species found in the Patapsco Forest Reserve, will publish shortly in the Proceedings of the Natural History Society of Maryland the results of his observations).

- 1-Fangs
- 2-Tongue
- 3-Gland
- 4-Glottis
- 5-Regular Teeth
- 6-Duct
- 7-Opening in Fang
- 8-Nostril
- 9-Pit

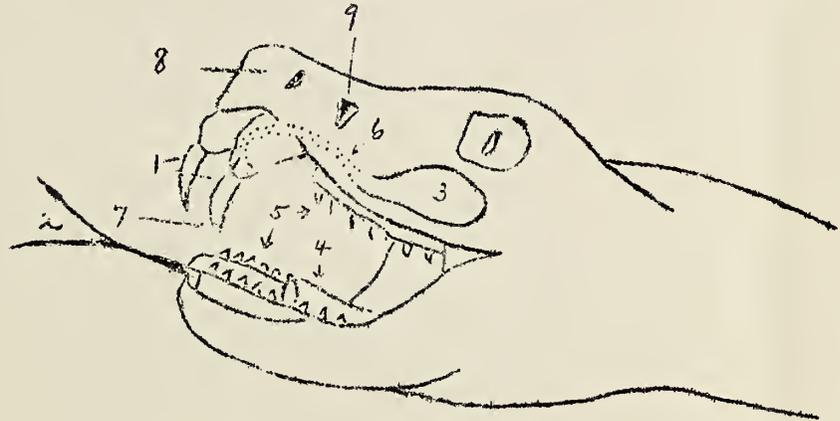


Figure 2

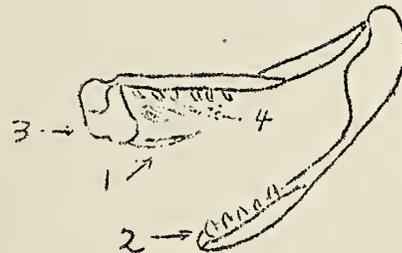
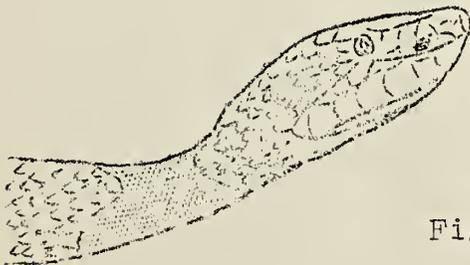


Figure 3

Head and neck of copperhead snake showing one of the characteristic chocolate-brown bands.

- 1-Fang folded back
- 2-Permanent Teeth
- 3-Movable Bone
- 4-Reserve Fangs



## FIFTY MINERALS I HAVE FOUND NEAR BALTIMORE

BY L. BRYANT MATHER, JR.

(Those interested in making short collecting trips for minerals will find the following list quite helpful. The works of Edward S. Dana, William E. Ford, and Frederick Brewster Loomis, as well as many articles in the various volumes of the Maryland Geological Survey, may be particularly useful for purposes of identification).

I Sulfides

1. Bornite . . . . . Bare Hills Copper Mine
2. Chalcopyrite . . . . . " " " "
3. Pyrite . . . . . Gwynns Falls Stone Corporation Quarry

II A Oxides of Silicon

4. Quartz
  - (a) Transparent. . . Towson (Dulaney Valley Road)
  - (b) Milky. . . . . Bare Hills Copper Mine
  - (c) Smoky. . . . . Avalon, Patapsco River
  - (d) Citrine(yellow) Hanover (near West Elkridge)
  - (e) Crystals . . . . . Bare Hills and Gwynns Falls
  - (f) Ferruginous. . . Govans, Hillen Road
  - (g) Flint. . . . . Soldiers Delight (West of Owings Mills)
  - (h) Moss-agate . . . . . " " " " " "
  - (i) Carnelian. . . . . " " " " " "
  - (j) Chalcedony . . . Bare Hills (Falls Road)
5. Opal . . . . . Bare Hills (Falls Road)

II B Oxides of Metals

6. Hematite . . . . . Hanover (near West Elkridge)
7. Magnetite . . . . . Bare Hills Copper Mine
8. Chromite . . . . . Bare Hills or Soldiers Delight
9. Pyrolusite. . . . . Bare Hills (Falls Road)

II C Hydrrous Oxides

10. Limonite . . . . . Timonium (Pot Springs Road)

III A Carbonates

11. Calcite . . . . . Cockeyville
12. Dolomite. . . . . "
13. Magnesite . . . . . Bare Hills Quarry (Falls Road)
14. Siderite. . . . . South Baltimore
  - (a) Sphaerosiderite Jones Falls Gneiss Quarry

III B Hydrrous Carbonates

15. Malachite . . . . . Bare Hills Copper Mine

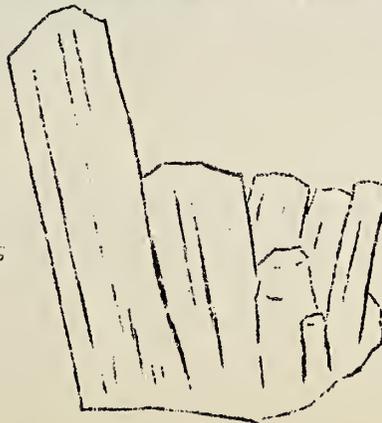
IV Silicates (A) Feldspar Group

16. Orthoclase. . . . . Jones Falls
  17. Microcline. . . . . Gwynns Falls
  18. Oligoclase. . . . . Wyman Park
  19. Plagioclase . . . . . Gwynns Falls
- (B) Amphibole Group
20. Anthophyllite . . . Bare Hills Copper Mine
  21. Tremolite . . . . . Texas, Maryland (H.T.Campbell Quarry)
  22. Actinolite . . . . . Stony Run, near Sisson Street
  23. Asbestos . . . . . Gwynns Falls
  24. Hornblende . . . . . Hollofield (Patapsco River)



- (C) Garnet Group  
 25. Almandite . . . . . Hollofield  
 26. Andradite . . . . . Falls Road (North of Bare Hills)
- (D) Topaz Group  
 27. Sillimanite . . . . . Bare Hills Copper Mine  
 28. Kyanite . . . . . Stony Run, Wyman Park
- (E) Epidote Group  
 29. Zoisite-Thulite . . . . . Stony Run  
 30. Epidote . . . . . Jones Falls, Gneiss Quarry
- (F) Subsiliates  
 31. Tourmaline (black) . . . . . Jones Falls  
     (a) " (brown) . . . . . Green Spring Avenue, Bare Hills  
 32. Staurolite . . . . . Falls Road (North of Bare Hills)
- (G) Zeolites  
 33. Phillipsite . . . . . Avalon (Patapsco River)  
 34. Stilbite . . . . . Jones Falls Gneiss Quarry  
 35. Leumontite . . . . . Woodberry Trap Quarry  
 36. Chabazite-Haydenite . . . . . Jones Falls Gneiss Quarry
- (H) Mica Group  
 37. Muscovite . . . . . Old Pimlico Road, Bare Hills  
 38. Sericite . . . . . Butler Quarry  
 39. Biotite . . . . . Jones Falls  
 40. Phlogopite . . . . . Cockeysville
- (I) Chlorite Group  
 41. Clinochlore . . . . . Hollofield Trap Quarry  
 42. Rhodochrome . . . . . Soldiers Delight
- (J) Serpentine-Talc Group  
 43. Serpentine  
     (a) Picrolite . . . . . Bare Hills Quarry  
     (b) Baltimorite . . . . . " " "  
     (c) Marmolite . . . . . " " "  
     (d) Williamsite . . . . . " " "  
     (e) Chrysotile . . . . . " " "  
 44. Dweylite-Gymnite . . . . . Bare Hills  
 45. Talc . . . . . " "
- (K) Kaolin Group  
 46. Kaolinite . . . . . Bare Hills (Falls Road)  
     (a) Lithomarge . . . . . " " " "  
 47. Halloysite . . . . . Stony Run
- V Phosphates  
 48. Apatite . . . . . Jones Falls
- VI A Sulfates  
 49. Barite . . . . . Jones Falls Gneiss Quarry
- VI B Hydrous Sulfates  
 50. Chalcantite . . . . . Bare Hills Copper Mine

CRYSTALS





Notes on the Miocene Formation of Maryland

By Elra M. Palmer

In the Calvert Cliffs south of Little Cove Point, on the western shore of the Chesapeake Bay numerous impressions of Xenohelix marylandica (Mansfield) were noted. The predominating form was the spiral type, always found standing vertically in the cliffs.

The Xenohelix marylandica was first described by Dr. Wendell C. Mansfield of the United States Geological Survey.\* The type specimens were collected in the low bluffs about 6 1/2 miles south of Cedar Point, St. Mary's County, Maryland. Excellent specimens of the coiled as well as uncoiled types were collected at this locality by Messrs. Palmer and Calder in November, 1932.

Dr. Mansfield offers no theory to explain the origin of these peculiar fossil forms. The generic name, Xenohelix, of Greek derivation--"Xeno - strange" and "helix - spiral," is certainly quite appropriate for these fossils. Dr. Mansfield suggests, however, that they may owe their origin to some marine plant, such as a fucoid (a seaweed, one of the Algae).

\* Mansfield, W. C. -- "Some Peculiar Fossil Forms from Maryland," 1927, Proceeding of the United States National Museum #2688-- Vol. 771--ART. 16



Specimen of Xenohelix marylandica in original vertical position. The geological hammer serves to show the comparative size of the fossil.



### Notes

Junior Exhibition - The Society's fall and winter activities were inaugurated on October 6 by the Second Annual Junior Exhibition. This exhibit of the Junior Division, open from 8 to 10:30 P.M., was attended by a great many visitors, among whom were a number of teachers from the schools of Baltimore City and the nearby Counties. The displays were unusually large and attractive; in fact, there was hardly sufficient room in which to place all the material. The exhibits consisted of minerals, fossils, insects, mounted flowers and leaves, birds' nests, diving equipment, drawings, photographic leaf prints, nature photographs, Indian artifacts, and tropical fish. These were displayed by David Bachrach, Woodward Burkhart, Clarence Burrier, Ned Crosby, George Didusch, Edmund B. Fladung Jr., Edwin Ghering, Andrew Goss, L. Bryant Mather, Jr., Govane McClees, Jerome Meusel, Charles Ostrander, Edmund Poffel, Carroll Wagner, Richard Webster, and Robert Wheeler.

Two features which attracted much attention were the microscope of Carroll Wagner, through which active paramecium could be seen, and the apparatus of Ned Crosby for illustrating fluorescence in minerals.

Trustees Meeting - The quarterly meeting of the Board of Trustees was held on October 12. Many matters required the attention of the Board, one of the most important of which was the revision of the Staff rules. This has become necessary because of the rapid growth of the Staff.

Junior Semi-annual Guest Evening - The first Semi-annual Guest Evening of the Junior Division was held on October 21. The feature of the evening was a lecture on "The Snakes of Maryland" by Mr. Harry C. Robertson, curator of the Department of Herpetology. Mr. Robertson illustrated his lecture with live and preserved specimens. Mr. Edmund B. Fladung, president of the Society, presented awards to the Juniors who had had the best exhibits at the Second Annual Junior Exhibition. Those who received awards were: Andrew Goss, Jerome Meusel, L. Bryant Mather, Jr., Woodward Burkhart, and Richard Webster. Honorable mention: Edwin Ghering, Edmund B. Fladung, Jr., Robert Wheeler, George Didusch, Ned Crosby, Carroll Wagner, and Govane McClees. Tea was served after the presentations.

Paleontological Meeting - On October 23, the bi-monthly meeting of the Department of Paleontology was held. Work was commenced on a large whale skull recently unearthed.

Lecture - The first of our fall and winter lectures was given on October 17 by Mr. Walter E. Price, Jr., assistant curator of the Department of Mineralogy. His subject was "The Mineralogical Features of a Small Section of Jones Falls Valley." Although Mr. Price limited the scope of his interesting lecture to a small area,



it was surprising to see the number of different minerals and varieties which he had found. The lecture was illustrated by specimens and lantern slides.

Weekly Talks - On October 11, Mr. Harry Zachary spoke about the new diving tank that is being constructed by the Department of Marine Research. He gave a detailed description of the tank that he and Curator Klingel will use in their next year's work.

"A Comparison of European and Maryland Butterflies" was the subject of a talk by Mr. Eugene R. Polacek on October 23. Among the number of species compared were Europe's *Papilio machaon* with our *Papilio asterius*, *Papilio podalirius* with *Papilio marcellus*, *Limenitis populi* with *Basilarchia astyanax*, and *Argynnis paphia* with *Argynnis cybele*.

On October 30, Mr. Irving Hampe gave an outline of the work of the Department of Ornithology, especially in regard to a checklist of the birds of Maryland. Of special interest was his description of the work he is doing in the State Forest Reserve. In the section of Glenartney and Orange Grove alone over 120 species have been recorded, twenty of them warblers.

#### Lectures to Outside Organizations

"Diving" was the subject of a lecture presented by Mr. Harry H. Zachary on September 29 to Troop 86, B.S.A. of the Walbrook M.E. Church.

At a meeting of the Rural Club of the Towson State Normal School on October 25, Mr. Earl H. Palmer of the Department of Botany explained the methods of preparing and preserving botanical materials.

#### Checklists of Birds

We note with interest "A List of Vermont Birds" by H. C. Fortner, Wendell P. Smith, and E. J. Dole, Bull. No. 41, State Department of Agriculture. 8 vo. 54 pages. This recent checklist of 298 species and subspecies of birds found in Vermont, with brief descriptions of most of the birds is of practical value and is an example of the type of work our Department of Ornithology has been engaged in with respect to Maryland birds. Members of this Department have been very active in collecting data in every part of the state. Associate members have been helpful. When the checklist and other descriptive material connected with it are completed (or as nearly so as possible), not an easy task, the results will be published in the Proceedings of this Society.



N315

*The Natural History*



*Society of Maryland*



## BULLETIN

Volume IV

NOVEMBER , 1933  
Herbert C. Moore , Editor

Number 3

### THE BARRED OWL (*Strix varia varia*)

BY R. BRUCE OVERINGTON

The Barred Owl is the commonest of the large owls found in Maryland. Its habitat is usually where there are swamps and tall timber with nearby streams or rivers, but now and then it goes on a foraging expedition to the uplands where game may be more plentiful. Often this owl is of great benefit to the farmers since it catches many small noxious rodents. To call it the farmers' "night policeman" (the Red Shouldered Hawk acting as the "day policeman") would be appropriate. Those farmers who realize how many dollars this bird saves them each year attempt to protect it.

Truly there are instances when the Barred Owl preys on other birds. In the winter months when mice are scarce it may catch a Bob White, or perhaps, a Mourning Dove. Walking through the snow one morning I saw a number of feathers of the Mourning Dove with a few long soft feathers of the owl, and I realized that I was witnessing one of the tragedies of nature. But as a whole, the good done by this owl surpasses by far the bad.



This nocturnal bird possesses the common characteristic of all owls - an unusually well developed sense of hearing. The slightest sound which would be imperceptible to the human ear is heard by the owl. Then, too, its nocturnal vision is especially keen, but in the daytime it sees less clearly.



John Burroughs, when speaking of this bird, aptly said, "His appearance by day is hailed by shouts of alarm and derision from nearly every other bird that flies and they literally mob him back into some dusky retreat. Silence is as to the breath of the nostrils to him, and the uproar which greets him when he emerges into the open day seems to alarm him as it does the pickpocket when everybody says 'Thief!'" So all during the day this owl sits quietly in some hidden bower surrounded as much as possible by the foliage of some tree or vine, and dreams perhaps of the happy hunting grounds which it soon hopes to find. As soon as the first shades of evening approach, it is all action and attention to the matters at hand. Very soon its weird "auc auc cu ewe wa" is heard throughout the woods.

The courtship of the Barred Owl begins in early February or sometimes as early as January. These birds are very ardent lovers. The whole woods seem to be alive with hoots. After the birds are mated, they choose a certain part of the woods for their domicile. I have never found two pairs of birds nearer to each other than one mile, and I do think, as a whole, that both pairs hunt in their own domains. Usually, their eyrie is located in a large hollow in a tree close to a pool of water or a running stream. They deposit their eggs in the last days of February or first days in March, according to the weather conditions and possibly, the age of the owls. Two eggs perfectly white, globular, in size about 1.95 mm.x 1.70mm. are usually the complete clutch, but sometimes three eggs are laid. The nest may be from one foot to five feet down in the hollow. Large gum trees, oaks, and beeches are preferred. In one case, I found a pair of these birds using a deserted hawks' nest.

Barred Owls use the same cavity year after year even after their nest has been robbed. However, if a nest has been found and disturbed before the eggs are laid, the birds will practically always desert the nest and go elsewhere. Even if one egg has been deposited this owl may leave its nest if disturbed.

I once found a nest of the Barred Owl which contained two eggs and a dead short-tailed mouse, but why the mouse had not been eaten I do not know. Raccoons sometimes break up owls' nests. If the first clutch is destroyed, no more eggs are laid that year.

In the middle of April the young may be found, several days to several weeks old. They are white, downy, and always ready to eat. When they think they hear one of the parent birds they make a peculiar snapping noise caused by the opening and closing of their mandibles. At first they are kept warm by the mother bird, but as time and mutation go on and they can fly, the mother bird leads them farther and farther from the nest until they can hunt for themselves.

In the locality of the Upper Patuxent River these owls are not quite holding their own because of the cutting down of the timber along the banks of the river. They are still abundant, however, and will probably continue to be so while there are deep timber lands near streams. They are not migratory. They must acclimate themselves to winter, when food is usually scarce. Consequently, those individuals which have the greatest strength, sharpness of eye, keenness of hearing, and speed to procure game in any season will survive.



## SOME FLUORESCENT MINERALS FOUND IN MARYLAND

BY WALTER E. PRICE, JR.

A fluorescent material is one which glows with a peculiar light of its own when light, usually of a different color, falls upon it. Minerals are only one of the many classes of materials that exhibit this phenomenon. In mineral fluorescence, ultra-violet light is used. Fluorescence in minerals is caused by minute amounts of certain impurities that act as light transformers, lengthening the wave-lengths of the invisible ultra-violet to wave-lengths the eye can detect. The fluorescent color varies, for example: red, yellow, blue, or green. Minerals exhibit fluorescence best under the wave-lengths of 3300 to 3700 angstrom units. The pure mineral does not fluoresce, and all specimens from the same locality that affords fluorescent specimens do not fluoresce. Ultra-violet light can be obtained from many types of apparatus, and unfortunately no one type gives all the rays which produce fluorescence. Frequently a fluorescent mineral does not show up because the wave-lengths to which it is sensitive are absent from the ultra-violet light thrown upon it.

Maryland affords a few specimens that fluoresce under the ultra-violet. Gymnite, a variety of deweylite, and a magnesium silicate, fluoresces a pale pea green under the rays of the argon bulb. In Maryland gymnite is found in serpentine rock with chalcedony, as a brown amorphous mass resembling gum arabic. It is found at Bare Hills, and at Delight, the first locality yielding the better specimens. The mineral is rare, and at Bare Hills it has been so exploited that now only poor specimens are to be found. It is a peculiar fact that the variety gymnite was first found at Bare Hills, and received its name in allusion to its occurrence there.

In Baltimore, in the Jones Falls pegmatite, a mineral has been found that fluoresces a brilliant green under the argon bulb. It occurs with apatite (a calcium phosphate) in microscopic, sulphur-yellow tabular crystals having a perfect basal cleavage. It is probably autunite, a calcium uranium phosphate, which was reported found at a nearby quarry many years ago. All specimens of the mineral autunite fluoresce. The Jones Falls specimen may be radioactive, a fact that is yet to be determined.

Another fluorescent mineral of Maryland is pearl spar, a variety of dolomite, which is a double carbonate of calcium and magnesium. It is found at Bluemont in trap rock. It occurs in white, pearly, platy crystals that fluoresce a beautiful pale bluish-green. The specimen is peculiar in the fact that all parts of it do not fluoresce, but the part that does fluoresce continues to do so after the exciting rays have been cut off; that is, the specimen is luminescent also. This, we believe, is the first reference to any fluorescent Maryland dolomite.

Up to the present time, according to the records of the Department of Mineralogy, these are all the minerals occurring in Maryland that are known to fluoresce. It is probable that there are a great many more.



It remains only to bring under our lamps the minerals believed to possess this characteristic. Anyone can find them as no deep knowledge of mineralogy is necessary. The amateur is amply rewarded by the dazzling results. The search for a fluorescent mineral is a fascinating pastime. Discovery is very exciting, for as the beautiful glow appears, and stands out from the dull rock, it is like a magical change that transforms the plain every day stone to a wonderful thing that seems almost alive.

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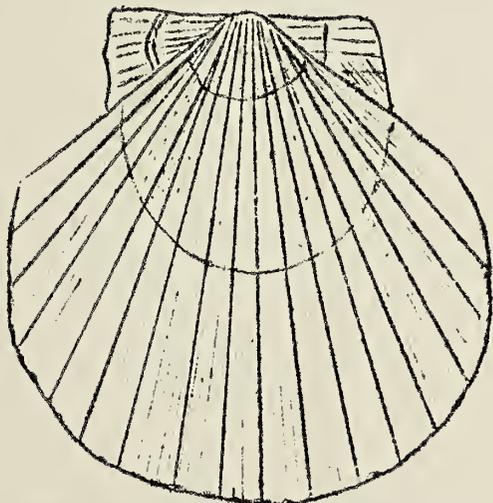
Notes on the Miocene Formation  
of Maryland

By Elra M. Palmer

One of the localities worthy of note, surveyed by our recent Southern Maryland Paleontological Expedition, was St. Leonard Creek (Calvert County, Maryland). The area surveyed is located about 3/4 of a mile on each side of the Mackall Wharf.

The Miocene outcrop in this area consists of a rock ledge at the base of the section. This ledge is similar in structure and position to the ledge which is found at the Drum Cliffs, near Jones Wharf on the Patuxent River. This rock ledge carries innumerable fossil remains which definitely place this deposit as of Choptank Formation and probably Shattuck's Zone 17.

The predominate Mollusca remains in this ledge are Melina maxillata, and Pecten madisonius. Large barnacles (Balanus concavus) typical of Choptank deposits are also plentiful. Two good specimens



Pecten marylandicus

of Pecten (Chlamys) marylandicus (Wagner) were found. This species is new to our study collection and has not been noted by us in any other locality.

It is interesting to note that no sand-dollar remains were found at St. Leonard Creek in the area which we surveyed in detail, whereas in the similar ledge found at Drum Cliffs and bearing the same characteristic fossils, sand-dollar remains (Scutella aberti) were very numerous.

A few other specimens which are new accessions to our study collection were found in this locality and will be described later.

Notes

Semi-annual Guest Evening - The Ninth Semi-annual Guest Evening of the Society was held on November 12. The occasion was especially devoted to the Miocene deposits of Maryland. An unusually fine collection of Miocene fossils was exhibited by the Department of



Paleontology. Among the specimens on display were two large whale mandibles and two whale skulls, all of which were secured by the department's expedition in 1932.

There was also on exhibition a fine collection of nature photographs taken by Mr. Edward McColgan and Mr. Gilbert Klingel of the Department of Ornithology.

The principal feature of the evening was a joint lecture entitled "The Miocene Deposits of Maryland" by the curator and the assistant curator of the Department of Paleontology, Mr. Elra M. Palmer and Mr. John B. Calder. Mr. Calder spoke first about the "Geographic and Geologic Relationship of the Miocene." This was followed by Mr. Palmer's lecture - "The Fauna and Flora of the Miocene." Charts and lantern slides illustrated these talks.

After the lecture tea was served.

#### Weekly talks

November 7 - Mr. E. Bruce Overington of the Department of Ornithology gave a short talk on the habits of birds, in which he told about many of the interesting observations he had made.

November 14 - "The Susquehannocks of Conowingo" was the subject of a short talk by Mr. Woodward Burkhart, who illustrated implements used by these Indians with specimens he had found at Conowingo.

November 28 - Mr. Francis O'Rourke of the Department of Botany presented an interesting talk with the title "The United States Government Plant Quarantine." Mr. O'Rourke, an employee of the Government in the plant quarantine work, told about the importance of the subject and the great benefits derived from such work by the public. Charts which accompanied the talk showed the tremendous scope of the work.

Junior Meeting - The monthly meeting of the Junior Division was held on November 18. Talks for admittance to membership were given by Clarence Burrier, David Bachrach, and Charles Ostrander.

Paleontological Meetings - The special semi-monthly meetings of the Department of Paleontology took place on the 3rd and 27th of November.

Lecture to Outside Organization - Mr. Elra M. Palmer, curator of the Department of Paleontology, delivered to the Church Club of the Clifton Methodist Episcopal Church on November 12 an illustrated talk concerning different phases of the World of Nature about us.

Ornithological Note - Mr. Irving E. Hampe, assistant curator of the Department of Ornithology, represented the Society from November 14-18 at the annual meeting of the American Ornithological Union held in New York City. Next month Mr. Hampe will describe some of the meetings he attended.



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BULLETIN



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Herbert C. Moore, Editor

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AN UNDERWATER NOCTURNE

BY GILBERT C. KLINGEL

On the 23rd of August, 1933, a terrific storm certainly verging on hurricane force ravaged the coasts of Maryland and Virginia. Excessively high tides accompanied by winds of extreme velocity eroded large sections of shoreline, and heavy rainfall caused the rivers to pour large quantities of fresh water into the Chesapeake. Three days later we rowed into the Patuxent River near Solomons with our diving helmets and equipment with the idea of seeing just what effect the storm had had underwater. We anchored in twenty feet of water and prepared to dive. It was night-time and all was dark save the pale sheen of the phosphorescent water.

On our last night-dive before the storm an electric flash-light held over the side lured innumerable organisms. Crustaceans, fishes, crabs and others milled about the glowing light, feeding on each other and in turn being fed upon. Stenophores and jellyfish throbbed by and all was activity. But on this night the water was deserted except for a few isolated sand prawn. We turned our light off, donned our helmets, and dropped beneath the surface. The water was brilliantly phosphorescent. Our hands glowed as if on fire and every movement brought to life streams of pale green light. Our waterproof flash-lights were turned on and cut a vivid and definite cone of light through the liquid blackness. For a moment no life showed in the beam but suddenly, wriggling undulating streaks of red began flashing back and forth. They moved rapidly, jerking and twisting as if filled with near-to-bursting energy. We recognized them as Nereid worms. They momentarily became more numerous until the water was flooded with them.



A  
Nereid  
Worm  
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Then a marvelous thing happened. A worm stopped its erratic streaking, paused, and began looping round and round over its length with undersides outward making a perfect semicircle of its body. Another worm swimming nearby dashed over to the looping worm and also began frenziedly looping, its orbit cutting the orbit of the first worm but at an angle to it. Then came another worm and another until eight frantically circling worms and the combined orbits of their circling formed a sphere.

The sphere slowly moved up and then as slowly drifted downwards. Another formed and still another. Up and down, up and down they drifted, so gently, but yet in themselves endowed with incredible energy. And against the liquid glow of underwater moved a swarming streaking mass of other worms. The significance of it all was puzzling. And why the numbers of worms on this particular night? On previous night-dives sea worms were not particularly numerous, their place being taken by various types of crustacea now absent. Was this a breeding time? Was the recent storm responsible in any way? We watched the spheres for some moments and then went to the surface. The flash showed nothing but empty water. Apparently the worms were all lower down.

We descended again and collected one of the circling worms in a vial. Hours later when home in the laboratory the worm was still circling round and round. It showed no signs of slowing up. But when daylight came it was dead.

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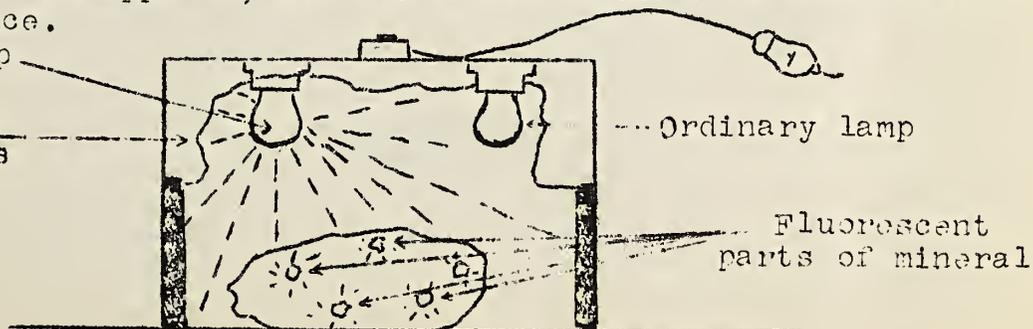
### FLUORESCENCE AND TRIBOLUMINESCENCE (Additional Notes)

BY WALTER E. PRICE, JR.

The apparatus for observing fluorescence in minerals is simple, consisting of an inverted black box containing an argon glow lamp and an ordinary electric lamp, both controlled by the same switch on the outside. One side of the box has half of its side removed to permit observation. The specimen is placed under the box beneath the lamps, and then illuminated by ordinary electric light. Then the light is switched off, thereby switching on the argon glow lamp. As soon as the ultra-violet light falls upon the specimen, the fluorescent minerals present glow with a weird light, and stand out from the rest of the rock which is non-fluorescent, and therefore inert. There is no mistaking the fluorescence when it appears, for on switching off the ultra-violet light, and turning on the ordinary light, the color disappears, and the whole of the rock resumes its former appearance.

Argon glow lamp

Box cut away  
to show lamps





Some crystalline minerals become luminous when rubbed or scratched. This property, known as triboluminescence, is exhibited by a variety of calcite found in Dyer's Quarry at Soldiers Delight. The crystalline calcite, which breaks up into perfect rhombohedrons under the blow of a hammer, is found in the serpentine rock of the quarry in large masses. When a specimen of this calcite is scratched by a steel file in the dark, an orange streak appears momentarily on the abraded surface. This is due to certain peculiar properties of the crystal, and is not due to sparks from the file, since other specimens of calcite do not give any light under the same conditions.

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THE PARTRIDGE PEA  
(CASSIA CHAMAECRISTA)

BY JOSEPH C. WHITE

The Partridge Pea is a showy little plant with sensitive leaves and yellow flowers in the summer and small deep-red seed pods in the fall. It belongs to the large and well known Pulse Family (Leguminosae). The genus Cassia, of which it is a member, contains species ranging from low-lying types to some that grow from six to twelve feet in height.

Chamaecrista is usually described as growing from one to two feet in height, but I have never seen it over one foot high in Maryland. In Virginia, however, it is reported to reach the greater height.

Its habitat is dry soil; frequently it is found in fields, and in thin growths on the edge of woods. Often, too, the Partridge Pea thrives in the cinders and coal dust by the side of railroad tracks. Only in these places have I seen it growing in large clusters. On several occasions these clusters covered areas of 120 square feet. One group, which I have been observing for the last three years, seems to possess an unchanging size - each year it has been practically the same, neither larger nor smaller.

The yellow-orange flowers of this plant measure from one to one and one-half inches in





diameter, possess five petals, and grow at the base of the leaves. These leaves are compound and are composed of twenty to thirty small leaflets, each tipped with a tiny bristle. If the sun gets too hot or the humidity too low, the leaflets betray their sensitiveness to these conditions by closing up. Since this species is a typical legume, the pod contains the customary neatly arranged little seeds which mature in October when the pod turns red and eventually brown.

When collecting herbarium specimens, the botanist finds this species hard to press, for a very short while after the plant is taken from the ground its leaves close up with the top surfaces together. They can be extended again by dropping the whole plant in water.

If cultivated the Partridge Pea might be a welcome addition to the garden. Grown in large clusters it would make a showy background for larger plants.

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DEPARTMENT OF ENTOMOLOGY NOTES  
BY F. STANSBURY HAYDON

This department during the current season has branched out from its original program of collecting specimens confined only to the orders Lepidoptera and Coleoptera and has thus far begun the nucleus of a collection of all orders. These notes are published for the benefit of the various members of the Society who are not informed or familiar with the functioning of this particular department. The study collection of Maryland insects including all 21 orders has been for the last four years the goal and ambition of our work. Recently we arrived at the point where we believed that a sufficient representative collection had been formed of the two above mentioned orders and that time might be taken from these two groups and used to advantage in carrying out the original program.

Possibly the most outstanding work has been done in the order Odonata. We have collected a formidable amount of material, some of the specimens being extremely fine and unusual. A new method of mounting has been employed to insure the specimens of permanent preservation. The method is that which was advised by the Department of Entomology at the University of Michigan and consists of the insertion of a very fine pin through the abdomen entering at the last segment and fixing the narrow body firmly to the more solid thorax. Also a very fine short wire is inserted through the center of the head between the compound eyes thus fixing the head firmly and permanently and avoiding the possibility of its breaking off through handling. More than fifty specimens have been taken comprising roughly twelve or fifteen species. Our policy will be to collect material and assemble similar species for later determination. This work will have to be done at the United States National Museum. In addition to this order, the collection has been increased by the accession of a very fine lot of specimens included in the orders Hymenoptera, Diptera, Orthoptera, and a smaller number in the orders Hemiptera and Neuroptera. All of this material is being carefully mounted and stored, being classified according to order for future determination and arrangement.



### TULAREMIA IN RABBITS

(This article is published at the request of E. Lee Lecompte, State Game Warden, Conservation Department, State of Maryland).

Prior to 1930, the State Game Department annually imported from 8000 to 10,000 cottontail rabbits from Kansas and Missouri. An outbreak of tularemia occurred in Maryland in 1929, the cause of which was traced to the handling and skinning of cottontail rabbits. Investigations made by the State Department of Health caused said Board to advise against further importation of rabbits to Maryland on account of this dreaded disease. Due to the demand from the sportsmen for rabbits for restocking purposes on January 2nd, 1934, we addressed a letter to the State Board of Health requesting to know whether or not they would advise the importation of rabbits this coming Spring for restocking purposes. Said Board replied that tularemia persisted throughout 1933, 14 cases reported; only 1 less than in 1932. The City Board of Health reported 11 cases of tularemia in Baltimore City in 1933 and in view of a number of cases which occurred in Maryland in 1933, the State Department of Health stated they would not at this time recommend the importation of rabbits, however, advised us to get in touch with the U. S. Public Health Service, requesting information as to the effect of tularemia in Kansas and Missouri in the past four years, States from which we had been importing these animals.

Under date of January 12th, Mr. R. C. Williams, Assistant Surgeon General, Division of Sanitary Reports and Statistics of the U. S. Public Health Service, replying to our inquiry of January 5th reports 120 cases of tularemia reported in Kansas by Brown, Lattimore and Hofmann, Kansas Medical Society of August, 1933, report covering cases from 1928 to April 27th, 1933. A quotation from Mr. Williams' letter is as follows:

"Skinning or handling wild rabbits, or preparing them for cooking was given as the mode of infection of 105 cases. Other methods included; skinning opossum, 2; dressing quail, 2; dressing quail or skinning squirrels, 2; skinning squirrel, 1; bite of wood tick, 1; fly bite, 1; and handling a cat, 1. The latter probably a mechanical infection. The method of infection in 5 cases was unknown or not given. Of the 105 rabbit contact infections, 98 were cottontail and 7 jackrabbits."

Said report also quotes 41 cases having occurred in Missouri, 1930 to 1932. A summary of the report is as follows:

Year	Kansas		Missouri	
	Cases	Deaths	Cases	Deaths
1930	16	00	20	00
1931	33	1	82	--
1932	38	1	87	1
1933	17		18	

Showing a decided increase in the disease in said States in 1931 and 1932; however, showing a decrease in 1933. Therefore, in reply to those interested in the hunting of cottontail rabbits, we are very sorry to report that acting upon advice of the State Board of Health and the U. S. Public Health Service, we will not import any rabbits this season.



NOTES

Lecture - On December 5, the members of the Society had the pleasure of hearing Dr. Howard A. Kelly deliver a lecture entitled "Snakes of the World." Dr. Kelly's lecture was of unusual interest inasmuch as it was illustrated with lantern slides and beautiful paintings, as well as with live specimens. During the lecture Dr. Kelly called particular attention to the snakes of our state.

Weekly Talks

December 12 - Mr. Irving E. Hampe, of the Department of Ornithology, described his visit to the Fifteenth Stated Meeting of the American Ornithologists' Union at the American Museum of Natural History in New York City, held November 13 - 16. The program consisted of the reading of sixty-nine papers, many of which were illustrated with slides and motion pictures. Other activities included the Banquet, a reception at the Aquarium, receptions at the homes of resident members, and an inspection of the various departments of the Museum. Those who remained until the 17th and 18th also took part in field excursions to the surrounding areas.

December 19 - Mr. Edward McColgan of the Department of Ornithology gave a very interesting talk on "Bird Banding," another phase of this department's work. Mr. McColgan traced the history of this subject and told of the valuable scientific data, especially in regards to bird migrations, which has been obtained by bird banding. He also demonstrated the method of bird banding advocated by the United States Biological Survey.

Paleontological Meetings - The semi-monthly meetings of the Department of Paleontology were held on December 4 and 18.

Junior Meeting - The monthly meeting of the Junior Division took place on December 21. This meeting was in the nature of a Christmas Assembly. The President of the Society addressed the Juniors, after which refreshments were served.

Lectures to Outside Organizations - On December 10, Mr. Woodward Burkhart of the Department of Archaeology delivered a lecture at Clifton Methodist Episcopal Church. His subject was "Indian Artifacts of the Conowingo Region."

"Snakes of Maryland" was the title of a lecture given to the boys of the Gilman Lower School on December 18 by Mr. Harry Robertson, Curator of the Department of Herpetology. Live specimens illustrated this talk. On December 20, Mr. Robertson delivered to the Knights of Columbus a similar lecture, illustrated by lantern slides as well as live specimens.

Exhibit - The temporary exhibits at the Enoch Pratt Library, which were removed for a short period of time, have been replaced with new exhibits. These exhibits are temporary too, pending the opening of the third floor of the Library, when permanent displays will be installed.



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BULLETIN



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FOUR QUEER FISH OF THE CHESAPEAKE BAY

By Frank C. Yingling

From the depths of the sea to the shallow water near the shore the piscatorial world consists of many queer fish, some of which are odd in form, others peculiar in habit. I have observed some of these odd fish at Cove Point, Maryland.

The Pipe Fish, *Syngnathus fuscus*, (Figure 1) is an auculeiform (needle-shaped) fish with a peculiar snout and a small mouth. It is a member of the order Lophobranchii which is distinguished by a curious mode of reproduction. A pair when mating intertwine their bodies like two letter S's, and the female by her ovipositor places her eggs in the marsupium (egg pouch) of the male, where they are fertilized and retained until they hatch.

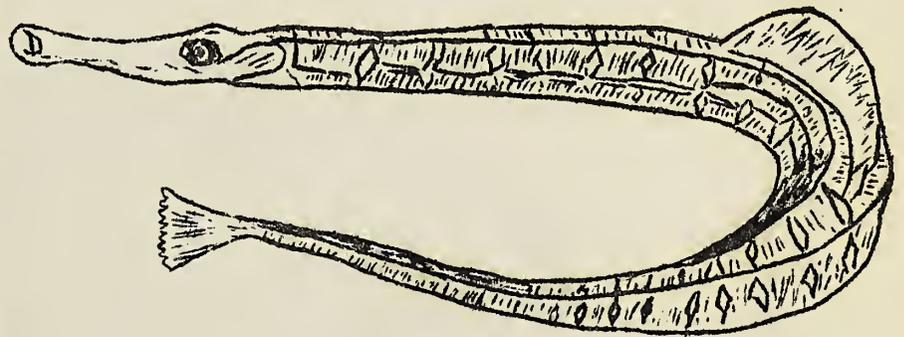


Figure 1

One specimen of this species, floating sluggishly at the surface of the water, was collected last summer about one-half mile from the shore. The specimen, a male about 150 mm. in length, contained a marsupium with young ready to hatch. Upon placing it in the killing jar, over forty fry were born. Each fry was 10 mm. in length and about the thickness of a heavy thread.

The Pipe Fish *Syngnathus fuscus* (X. 1½)

The Blow Fish or Puffer, *Tetradon maculatus*, (Figure 2) a globiform-shaped fish, inflates its body when attacked. The body

The Blow Fish or Puffer, *Tetradon maculatus*, (Figure 2) a globiform-shaped fish, inflates its body when attacked. The body



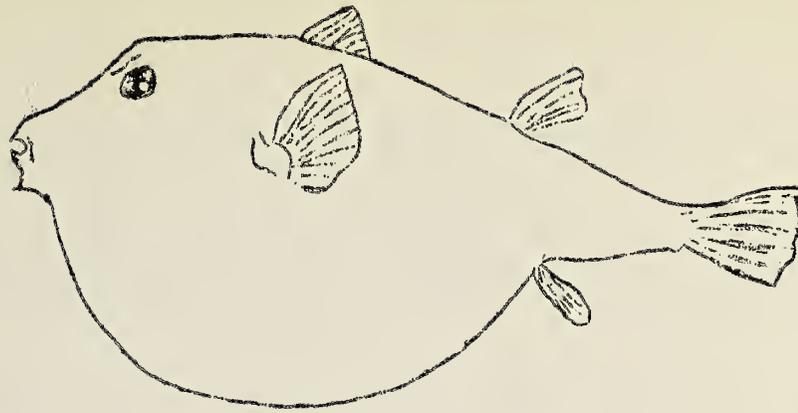


Figure 2

The Blow Fish (Inflated) *Tetrodon maculatus* (X1/3)

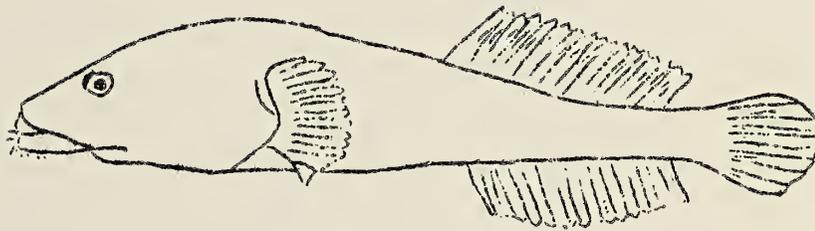


Figure 3

The Cling Fish *Gobiesox strumosus* (X3)

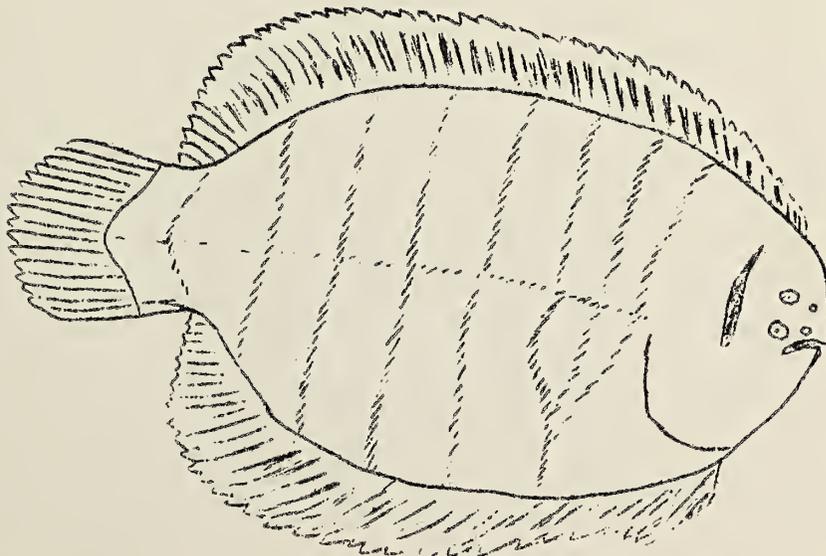


Figure 4

The Common Sole *Achirus fasciatus* (Natural Size)



is scaleless, but possesses small spines which are most numerous between the eyes and the back.

When in a group these fish are known to attack a crab and kill it by piercing its shell with their parrot-like teeth.

The eggs of the Blow Fish are produced in great numbers. The fry when born are similar in shape to the adult. Several specimens which varied in length from 140 mm. to 225 mm. were observed last summer.

The Cling Fish, *Gobiesox strumosus*, (Figure 3) is a tadpole-shaped fish possessing on the ventral part of its body a sucking disk which helps it to cling to rock, shells, and the like. This sucking disk is not derived from modified fins but from the folds of the skin and underlying muscles. After the Great Storm last summer the Cling Fish was very abundant at Cove Point in small pools along the shores. The specimens collected were about 20 mm. in length and had sucking disks 7 mm. wide.

The Common Sole, *Achirus fasciatus*, (Figure 4) is known also as the Aeroplane Fish because of its free undulating motion through the water. It is a member of the Heterosomata, a suborder consisting mostly of "shore" fishes. The body is flattened from side to side. When born the fry have the eyes on each side of the body, as do other fishes, but as the young fish grows, one eye migrates over the top of the skull and places itself close to the other, while the fish continues its life reclining on one side.

The spawning takes place in the late spring. The female, about 165 mm. in length, contains in her ovaries approximately 54,000 eggs. Several of this species were observed last summer at Cove Point. These specimens ranged in length from 60 mm. to 85 mm.

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## WILD FERNS IN THE GARDEN

By Earl H. Palmer

In your rambling walks in the woodlands, how often have you wished to bring back a bit of Nature's most delicate and perfect leaf-work - the Filicales (True ferns). They look very fragile as they grow in the shade of a group of trees, but, contrary to appearance, they can be successfully transplanted with correct handling.

An American Fern Journal says that the best time to transplant ferns is in late spring or early summer. I have had excellent success with ferns transplanted in July and August. In any event, it is best to transplant them when the fronds are reaching maturity, since this gives one an idea of the size of the plant and, consequently, of the receptacle needed.

I once read, "Give ferns what they need, and as they need it, and they will amply repay all your cares." No statement says so much in so few words. Plant your specimen in as nearly the same manner as



you found it; if the crown is above the surface, as the *Dryopteris marginalis*, do not cover it with an inch of dirt; do not plant the creeping rhizome of the *Osmunda cinnamomea*; if the fern is growing in the shade, do not place it in a direct sun-light. Most all the Filicales show preference for rich loam.

In digging the fern plant start several inches from the base of the outermost frond. Once the earth has been broken use your hands to remove it - the fingers are more sensitive than a trowel and the chances of injuring the rhizome are less. Wash off as much superfluous dirt as is possible and wrap the whole plant in damp moss or wet newspaper. After the fern has been transplanted, cut off all broken fronds and keep the freshly planted Filicale well moist.

Most of the ferns are suitable for home gardens except *Pteridium latiusculum*, *Onoclea sensibilis*, *Dennstedtia punctilobula* and *Dryopteris palustris*.

Marginal Shield Fern  
(Leather Woodfern)  
*Dryopteris marginalis*



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#### NOTES

Lecture - On January 30, Dr. Joseph L. Wheeler, Librarian of the Enoch Pratt Library, delivered a very interesting lecture at the headquarters of the Society. In this lecture, entitled "Natural History and the Library," Dr. Wheeler pointed out the important work the Library was doing in bringing to the notice of the public the best literature on Natural History. One special means of doing this is by Science Booklists, embracing most of the Natural Sciences. These may be procured at the Library.

#### Weekly Talks

January 9 - Mr. Richard E. Stearns of the Department of Archaeology spoke about the importance of pattern designs on pottery in the identification of village sites.

January 16 - An interesting talk concerning observations made on



the metamorphosis of the moth, *Samia cecropia*, was given by Mr. Edgar E. Gretskey of the Department of Entomology. Some very fine original drawings of the various stages of this moth's life history were shown.

January 23 - "Some Fresh Water Fish of the Families Cyprinidae, Cottidae, Centrarchidae, and Poeciliidae" was the subject of a talk by Mr. Frank Yingling of the Department of Marine Research. Mr. Yingling spoke especially about fish found in the Chesapeake Bay.

#### Lectures to Outside Organizations

January 16 - Mr. Elra M. Palmer, Curator of the Department of Education, delivered a lecture to the Natural History Section of the Private School Association. The subject of Mr. Palmer's talk was "Ways and Means to Interest Young People in Natural History."

January 19 - A lecture on the "Japanese Beetle" was given to Troop 83, B.S.A., Lutheran Church of the Redeemer, Gwynn Oak Avenue, by Mr. Eugene R. Polacek of the Department of Entomology.

January 21 - "Nature Trails in the Spring" was the subject of a lecture given by Mr. Edmund B. Fladung, president of the Society, to the Young People's Club of the Clifton M. E. Church.

January 23 - Mr. Harry C. Robertson, Curator of the Department of Herpetology, delivered four lectures to the Science Department of the Baltimore City College. His subject was "Maryland Snakes and How to Identify the Poisonous Ones."

Junior Meeting - The monthly meeting of the Junior Division was held on January 27. The most important feature of the evening was a lecture by Mr. Francis O'Rourke entitled "The United States Plant Quarantine."

Exhibit - An exhibit of nature photographs was held in conjunction with the Hobby Club of the Y.M.C.A. on January 1 and 2 at the Central Y.M.C.A. Building.

Trustees Meeting - The quarterly meeting of the Board of Trustees was held on January 13. The business transacted included the appointment of a Nominating Committee since the terms of three Trustees expire on February 28, and the appointment of a Budget Committee to draw up the budget for our coming fiscal year, commencing March 1, 1934. The Nominating Committee consists of Mr. A. Llewellyn Jones, chairman, Mr. John Calder, and Mr. Elra M. Palmer; the Budget Committee, of Mr. Edmund B. Fladung, chairman, Mr. Edward McColgan, and Mr. Gilbert C. Klingel.

As this year is the fifth anniversary of the Society, the Trustees decided to have a ceremony befitting the occasion, and plans are being made accordingly. Mr. Elra M. Palmer was appointed chairman of the Fifth Anniversary Committee, which consists of all the Trustees.

Collection Donated - A collection of Miocene Fossils was given to the State Normal School. This is another phase of the Society's work, which will be extended as duplicate material accumulates. Other requests for such collections have been received by the Department of Paleontology and are now being filled.

#### Other Meetings

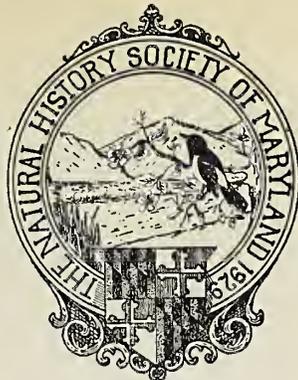
Paleontology - January 8 and 15, the semi-monthly meetings of the Department of Paleontology.

Entomology - January 31, the first special weekly meeting of this department. This department has reorganized its work and will hold a special meeting every Wednesday evening.



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*The Natural History*



*Society of Maryland*



## BULLETIN

Volume IV

FEBRUARY, 1934  
Herbert C. Moore, Editor

Number 6

### AFTER FIVE YEARS

By Edmund B. Fladung

President, The Natural History Society of Maryland

It is now five years since the Natural History Society of Maryland was organized. During this period the activities of the Society have increased steadily in their usefulness to this community.

The mission of our Society is to bring to as many persons as possible the Natural History of Maryland. The chart accompanying this article gives some idea of the steady growth and progress of this Society from year to year.

MEMBERSHIP There were eight gentlemen who organized the Natural History Society of Maryland. The organizers in drawing up their constitution and by-laws laid particular stress on a high type of membership. In consequence, the growth in members has been slower perhaps, than in many other societies; nevertheless we have developed from our members a very large number of interested staff workers. The fruits of such a rigid constitution resulted in a Board of Trustees, seriously and intensely interested in Natural History. All of the seven Trustees are working in one or more of our departments and six of these seven are heads of departments.

Of the original eight founders, after five years, three are Trustees, four are heads of departments and two are connected with some department. This illustrates the sincerity of the founders and the interest that our members have in our work.

The qualification for Junior membership is even more rigid. Before a Junior is admitted to membership he must read a paper or deliver a talk on some original work done by himself in one of the many branches of Natural History. Therefore we have only interested and trained young men, who after a time are taken up by department



heads and placed upon their respective staffs. To date two of these Juniors after becoming of age have become Senior members, and twelve others are now working in various departments.

NIGHTS OPEN AND ATTENDANCE The original plan of the organization was to have Tuesday evening of each week for general assembly and lectures. The Society was to be closed only when important holidays came upon a Tuesday. Usually the members of the staff were engaged in field work on these holidays. After a time this plan had to be modified because of the many activities which compelled the opening of the Society on other than Tuesday evenings. One of the reasons was that the members of the Junior Division have a special evening each month assigned them. Other evenings have developed for various departments and staff workers.

It may be seen by the accompanying chart that at the end of February, 1930, we had 24 members, with 49 assembly evenings and 335 persons attending, whereas at the end of February, 1934, we had 82 members with 99 assembly evenings and 1901 persons attending.

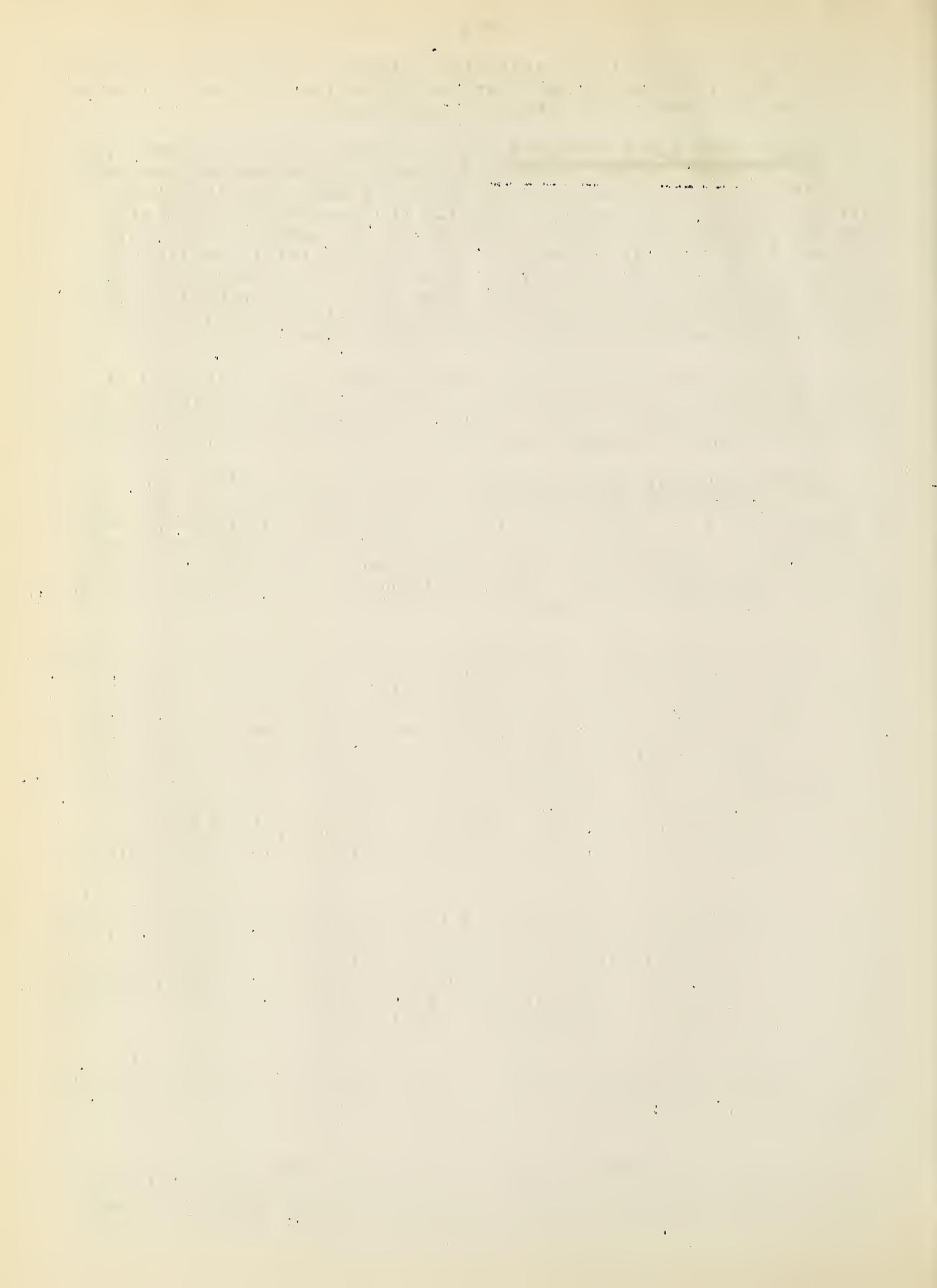
DEPARTMENTS AND STAFF WORKERS In the year 1929-1930 the Trustees installed 5 departments and had 7 staff workers. The departments were: Geology, Entomology, Herpetology, Ornithology, and the Library. The following year Conchology was added, and in the year 1931-32 a Department of Archaeology and a Department of Education and Publication. The staff was increased to 20 workers and in the year 1932-33 to 30 workers.

During the past year (1933-34) the Trustees deemed it necessary to revise and reorganize our departments, since the interest in the Society had expanded to such an extent that there was an overlapping in some departments and many new activities were being inaugurated. This necessitated the dividing of the Department of Geology into two separate departments, one of Mineralogy and another of Paleontology. The same condition caused the Department of Education and Publication to be divided in like manner; that is, a separate Department of Education which embraces the lectures, exhibitions and the Junior division, and a Department of Publication, which assumes complete control of all of the publications of the Society.

The Department of Conchology was fused into the Department of Marine Research, a new activity. A Department of Botany, also a new activity of the Society, was inaugurated. At present we have 11 departments, namely: Mineralogy, Paleontology, Botany, Marine Research, Entomology, Herpetology, Ornithology, Archaeology, Education, Publication, and the Library. Attached to these 11 departments are 38 staff workers, including the curators in charge.

LECTURES The lecture service in the Society is divided into three captions; monthly lectures at which guests are invited, weekly talks or demonstrations for members only, and lectures to outside organizations.

At first the monthly lectures were given during the fall and winter months, but in our fourth year they were continued into the spring months. This year there were two lectures during the month instead of the usual one. A total of 50 lectures was given over a



period of five years. Many of these lectures were by noted men of Science outside of the organization, but the majority were by our own staff.

TALKS AND DEMONSTRATIONS In the midyear of 1932-1933 it was decided to institute a series of informal talks or demonstrations on some phase of Natural History. These talks were held every evening, except those evenings on which there was to be a formal lecture. So far 48 of these talks have been given, 36 in this last year.

LECTURES OUTSIDE OF THE SOCIETY Since its organization the Society has been called upon by schools, church clubs, lodges, boy scout troops, and societies to give lectures upon Natural History. Nearly all of the lectures were illustrated with lantern slides, photographs, motion pictures, and live specimens. Of a total of 69 lectures, 4 were given in 1929-1930, 12 in 1930-1931, 8 in 1931-1932, 15 in 1932-1933, and 30 in 1933-1934. It will be noted that 43% of the lectures were delivered in our fifth year.

An exact record of attendance was kept of the number of persons contacted through this medium. If one studies the chart, it will be seen how popular these lectures have become. Whereas in 1929-1930 the attendance registered 231, in 1930-1931 it registered 591, or an increase of over 155%. In 1931-1932 there was a slight decrease which was made up the following year (1932-1933) to 1353 persons. This last year (1933-1934) the attendance has increased to 3712 or 174% over the previous year or 1500% over the first year. These figures show how our Society is carrying its mission to the people of our City and State, and how well it is being received.

EXHIBITIONS In 1931-1932 we inaugurated our first public exhibition. Since then we have had 8 exhibitions each year, or to date 17 exhibitions in all. These exhibitions do not include the exhibits at the Enoch Pratt Library which were inaugurated over a year ago, and are in the nature of permanent displays.

These exhibitions covered a wide range of subjects, but all on Maryland Natural History. Among the exhibits were two on nature photography, one of which was at the Baltimore Museum of Art, the other at the Maryland Institute. Other exhibits were at various public high schools of the City and State, at scout troops, and a number were as window displays at the Enoch Pratt Library. At times these exhibits were held in conjunction with various studies in the schools.

This phase of our work is yet in its infancy and we hope to be in a position shortly to have a series of rotating exhibits for schools and branch libraries.

Two interesting exhibitions worthy of mention were held by our Junior Division, one last year and another this year. At both of these exhibits there were large crowds. The exhibits were only for the evening, from 8 to 10 P.M. One hundred and seventy-seven persons attended the one in the year 1932-1933, and two hundred and twenty-five persons in 1933-1934. Many requests were received from schools to have the exhibits in the afternoon as well as the evening. This will be an annual feature which will be given more publicity and continued over a longer period of time.

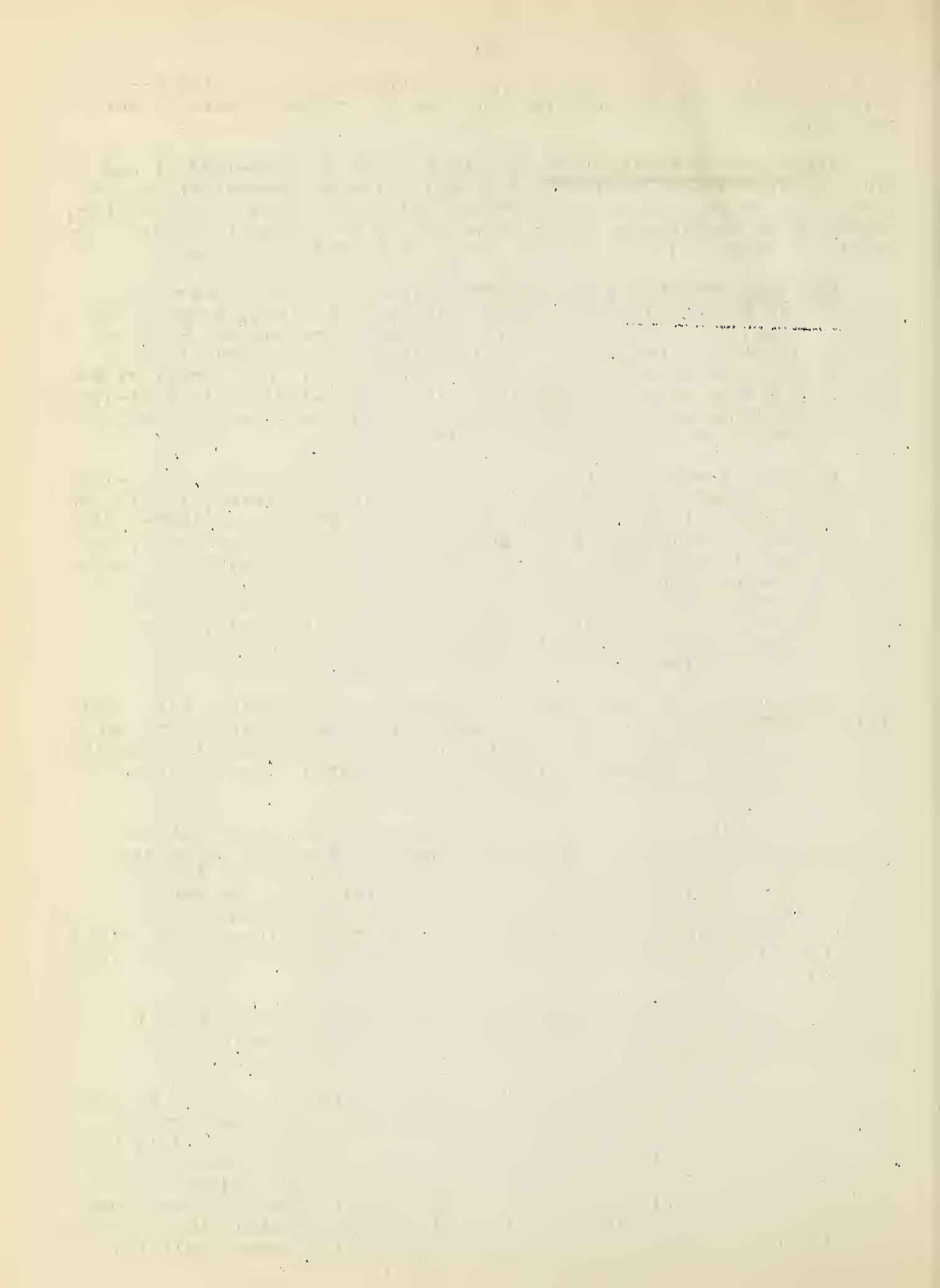


CHART SHOWING PROGRESS FOR THE PAST FIVE YEARS.  
ORGANIZATION

	1st year 1929-30	2nd year 1930-31	3rd year 1931-32	4th year 1932-33	5th year 1933-34
MEMBERS	24	34	50	84	82
NIGHTS OPEN	49	57	60	76	99
ATTENDANCE REGISTERED	335	371	592	1423	1901
ACTIVE DEPARTMENTS	5	6	8	8	11
ACTIVE STAFF WORKERS	7	7	20	30	38
ACTIVITIES					
LECTURES AT THE SOCIETY	6	5	8	13	18
LECTURES OUT-SIDE SOCIETY	4	12	8	15	30
INFORMAL TALKS & DEMONSTRATIONS AT SOCIETY	-	-	-	12	36
TOTAL OF ALL LECTURES	10	17	16	40	84
PERSONS ATTENDING	231	591	499	1353	3712
EXHIBITIONS OUTSIDE OF SOCIETY	-	-	1	8	3
ARTICLES PUBLISHED IN VARIOUS PERIODICALS	-	8	18	15	25
PUBLICATIONS ISSUED	2	3	3	3	3
COLLECTIONS GIVEN	-	-	-	-	1



The exhibits at the Enoch Pratt Library (Central Branch) have been on display for a year. They are only temporary. The permanent exhibits are now under construction and will present a series of demonstrative exhibits as an aid to the fundamentals of Natural History.

PUBLICATIONS For lack of funds this branch of our work has not been as extensive as we should like; nevertheless we have been able to publish within the past years four transactions, four annual reports, one guide leaflet and four volumes of our bulletin. This work we are prepared to extend; in fact, a number of transactions are ready for publication as soon as funds are available.

Aside from the above publications we published 66 articles in various periodicals in the country. These articles appeared in Natural History, National Geographic, The London Times, Naturens Vidundere, Nature Magazine, Novitates of the American Museum, The Auk, The Sunday Sun Magazine, The Sunday Sun Photogravure Section, The Municipal Journal and a number of school papers.

COLLECTIONS TO BE GIVEN TO SCHOOLS This is the most recent activity in the Society. As duplicate specimens accumulate, it is our intention to make collections and give them to schools where Nature Study is being taught. So far we have donated but one of these collections, consisting of Miocene fossils, the recipient of which was the State Normal School at Towson. This work will be continued as material is accumulated.

IN CONCLUSION Our Society has four definite mediums by which we reach the public of Baltimore City and the counties; namely, lectures, exhibitions, publications and the donation of collections to schools. Our lecture service promises to be more sought after this year than ever and at the present writing there are three lectures scheduled for the month of March which will be attended by approximately 1000 persons. The exhibits given to the State Normal Schools are being viewed by 500 students. This method of reaching students is one of the best. First of all, it is permanent; secondly, there are always new students entering the school each year; and lastly, when their studies refer to the exhibits, the subject becomes doubly interesting.

From our activities of the past five years, some approximate figures may be gleaned of the amount of persons contacted through the above mentioned mediums, and after a careful survey the following figures have been compiled; by lectures - 6326 persons, by exhibitions - 107514 persons, by publications - 3204 persons, and by exhibits donated - 200 persons, or a total of 117304 persons within the past five years. These figures are very conservative.

SCIENTIFIC ACTIVITIES In our scientific work we have been making continual advancement. This progress has been attained by the field work of our enthusiastic staff. Fifty percent of the Society's work has been in the field. To date 5895 days have been spent collecting and studying the Natural History of our State. Every week some parties are in the field, and in the spring, summer, and fall all departments are engaged in this manner.

It would be difficult to enumerate the many field trips and the results attained, but an idea can be had of the most important.



In the field of HERPETOLOGY two important expeditions were conducted, one to Haiti and Santo Domingo, and the other to Greater Inagua Island. By the latter expedition, a complete Herpetological and Geographical survey was made of the Island of Greater Inagua, one new genus of lizard was discovered as well as three new species and one new sub-species. On the expedition to Haiti the first motion picture was made of the giant Rhinoceros Iguana, an inhabitant of the Island of La Petite Gonaves. Also, for the first time, the life histories of the lizards of the Genus Ameiva were worked out. In addition, this department has made a check list of Maryland snakes, with some species not previously recorded in this range.

The Department of PALEONTOLOGY has had two very important expeditions, the St. Mary's Expedition which extended over a period of 14 days, and the Southern Maryland Expedition which covered a period of 21 days. Both of these expeditions have resulted in a very fine collection of Miocene fossils, among which are three very rare whale skulls, three whale mandibles, two new species of fossil crabs and several new species of mollusks.

The Department of ORNITHOLOGY has been working on a check list of Maryland birds, and has accumulated a large collection of bird photographs with notes on arrivals and nesting dates. The department has been conducting a bird banding station and to date 273 birds have been banded. An expedition was made to Jobbs Island to study nesting habits of terns, gulls, and black skimmers, and a survey was made of the osprey population of the Chesapeake Bay.

For study and exhibition a collection of mounted birds and bird skins is being made. Some of the birds as well as some mammals are now on exhibition at the Enoch Pratt Library.

We now have a large collection of Indian implements and pottery in our Department of ARCHAEOLOGY. The department's most valuable work is the mapping of Indian village sites of Maryland which are gradually being obliterated. This work is being conducted in regards to the study of locality in correlation with the known information regarding the Indian tribes of the coastal plain region during colonial times.

The Department of ENTOMOLOGY has now a representative collection of Maryland insects, as well as a comparative collection of exotic insects, and a nearly complete collection of Maryland Rhopalocera (butterflies). In conjunction with the butterflies a check list is being prepared and is almost ready for publication.

The first underwater exploration of the Chesapeake Bay was made by our Department of MARINE RESEARCH. This department is making a survey of underwater life of the Chesapeake, and although a new department, it has gathered a fair amount of material with copious notes.

The Department of MINERALOGY has added two new specimens to the minerals of Maryland and is now revising the check list of Maryland minerals, with special notes on their fluorescence and luminescence. A large study collection of Maryland minerals is also being prepared. The department has conducted many field trips, but the most important was an expedition to Western Maryland.



The most recent department in the Society is our Department of BOTANY, but nevertheless it is doing some very important work. Research in the PH values of soil in regards to the cultivation of Maryland wild flowers is being conducted, and a herbarium of wild flowers and plants of an area adjoining Baltimore is being made. So far we have a rather complete collection of Maryland Ferns as well as a large collection of colored photographs of Maryland fungi.

AN AFTER THOUGHT After careful thought and study of the amount of activities and work done, especially when one considers that all is being done gratis by a staff that gives valuable time, as well as funds to carry on this important work, it is evident that the past five years have been very fruitful. We are endeavoring to make our results available to the public as soon as funds are forthcoming, but in the meantime we are planning a further extension of our work, and to that end we are enlarging our program.

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### NOTES

Lecture - On February 20, the Society had the pleasure of hearing a rather unique lecture by Mr. Gilbert J. Klingel, Curator of Marine Research and Mr. Harry M. Zachary, Assistant Curator, entitled "Exploring the Bottom of the Chesapeake." The lecture was well illustrated with lantern slides.

#### Weekly Talks

February 6 - Mr. John B. Calder of the Department of Paleontology spoke on the organization and work of this department.

February 13 - Mr. Joseph White of the Department of Botany spoke about work done in this recently organized department.

February 27 - "Ferns and Their Mythology" was the subject of a short talk by Mr. Earl H. Palmer, of the Department of Botany.

#### Lectures to Outside Organizations

On February 12, Mr. Earl H. Palmer, gave a lecture entitled "Fossils" to the 3rd grade of the Campus Demonstration School at The State Normal School, Towson.

Mr. Harry C. Robertson, Curator of Herpetology gave a lecture on "Reptiles" at the Baltimore City College. The lecture was illustrated with live specimens.

Junior Meeting - The monthly meeting of the Junior Division was held on February 24. The lecture of Mr. Klingel and Mr. Zachary - "Exploring the Bottom of the Chesapeake" - was repeated for the Juniors. Commencing with the month of March the Junior Division will have two meetings each month, on the first Saturday of each month and on the third Saturday of the month.

Staff Meeting - The semi-annual meeting of the Staff was held on February 16. Plans for the anniversary celebration were discussed, as well as those relating to the spring and summer activities.

Departmental Meetings - On February 7, 14, 21, and 28, the Department of Entomology held its weekly meetings.

The Department of Paleontology held its semi-monthly meetings on February 12 and 19.

The Department of Botany held its first reorganization meeting on February 23. Hereafter this department will hold its meetings on the first and third Fridays of each month.

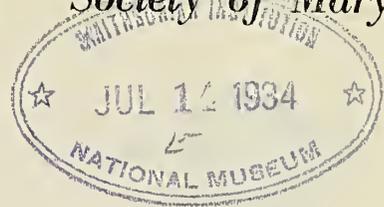


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*The Natural History*



*Society of Maryland*



## BULLETIN

Volume IV

MARCH , 1934  
Herbert C. Moore , Editor

Number 7

### WOOD WARBLERS OF MARYLAND (Family Compsothlypidae)

By Irving E. Hampe

There are about 160 species of wood warblers known, forty-four of which are found in the United States during migration, most of which breed here. With a few exceptions they are insectivorous, and are therefore migratory. With the first warm days of spring these exquisite birds may be observed migrating to their breeding grounds. To the inexperienced bird student they form one of the most difficult groups to identify. Small, usually on the move, they give the student very little opportunity to observe them. During the spring migration when they are breeding, most of them, especially the males, are of brighter plumage. At this time they appear to be spots of sunlight dancing in and about the newly developed foliage. As a rule they are arboreal, but some are thicket haunting, and some are terrestrial.

About two-thirds of the forty-four mentioned above are found in the Eastern States during migration. At the present time I have recorded twenty-two species, most of them in the vicinity of Glenartney, Maryland, in the Patapsco State Forest Reserve. Other localities are noted in the following list.

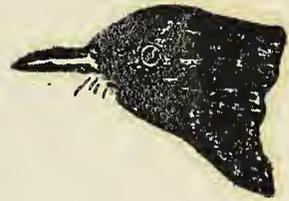
It will be noted that most of the transient species were observed during the spring migrations. In the fall they are far less discernible due to the loss of the brilliant nuptial plumage, and since this fall migration takes place while the trees are still thickly foliaged. Thus it is difficult to observe and identify these birds.

The young of these species are altricial; that is, born blind, naked, and helpless. They are reared in the nest until their juvenile plumage grows and their wings are capable of sustaining them in flight. They are fed predigested food by the parents until they are able to digest their own food. The parents continue

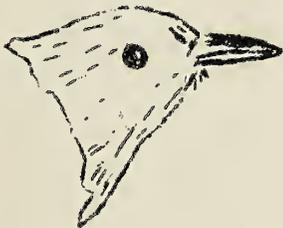




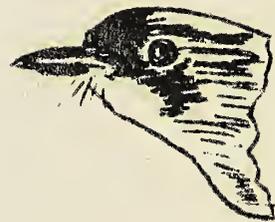
KENTUCKY WARBLER



REDSTART



YELLOW WARBLER



MYRTLE WARBLER



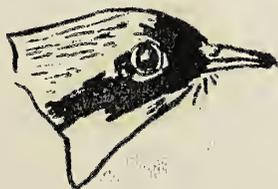
YELLOW-BREASTED CHAT



BLACK AND WHITE  
WARBLER



OVENBIRD



MARYLAND YELLOW THROAT



LOUISIANA WATER THRUSH



feeding the young after they have left the nest, sometimes for a period of one month.

The following notes cover observations during the years 1930 through 1933. A list of the breeding species with my observations follows.

Maryland Yellow-throat (*Geothlypis trichas trichas*)

~~This warbler~~ is one of the commonest species of the family *Compsothlypidae* observed in the State Forest Reserve. From May 1 to the latter part of September, one may find this inquisitive creature flitting among the low bushes, giving voice to its characteristic call note. It breeds during the latter part of May. The nest is bulky, of strips of bark and leaves, lined with grass or rootlets. It is located on or near the ground. The clutch consists of three to five white eggs, each speckled with rufous at the larger end.

Redstart (*Setophaga ruticilla*)

A pair was observed building a nest in a crotch of a sapling on June 15, 1932. Several days later the nest was visited and found to be deserted. Although a close watch was kept the pair did not return. The nest was firmly woven in the crotch. The materials used were strips of bark and plant down. This species was observed from May 3 to September 15. The eggs of this species, numbering four or five, are bluish white, spotted at the larger end with brown.

Black and White Warbler (*Mniotilta varia*)

A conspicuous creeper, readily identified by its unusual habits. Very common after May 15 until late September. My notes do not contain any record of nests observed during the breeding period, but another observer gives May 30 as a nesting date when he discovered a nest with four eggs in a knothole in a telegraph pole. I examined this nest sometime later, but the young had flown. The nest was made of strips of bark and grass loosely packed in the knothole.

Louisiana Water Thrush (*Seiurus motacilla*)

A common summer resident. Observed along the mill race at Glenartney, Maryland, and along nearby streams from May 1 to October 1. Since it is a very shy bird, one seldom observes it unless especially searching for it. The nesting date for one pair was May 13, 1931. The nest of twigs and rootlets is usually located under a bank near a stream. There are usually four eggs, although I have recorded six from one nest. The eggs are white spotted with distinct brown markings.

Ovenbird (*Seiurus aurocapillus*)

A common summer resident. Usually observed on or near the ground. Observed from May 8 to September 8. Although it is a common bird in the vicinity of Glenartney, Maryland, I have located but one nest. It was a bulky, roofed affair of grass and bark fibers, located on the ground. It contained five eggs which were destroyed during a storm. The nest was located on a steep hillside and was washed away.



Kentucky Warbler (*Oporornis formosus*)

During 1931 I observed but one Kentucky Warbler at Glenartney, Maryland. During 1932 they were fairly common from May 26 to August 27. Their nests, always built on or near the ground, are composed of twigs and rootlets firmly wrapped with several thicknesses of leaves. Four to five eggs, coarsely blotched with brown, are the usual clutch.

Yellow-breasted Chat (*Icteria virens virens*)

Although I have observed this species in various localities, I have found it rather uncommon about Glenartney, Maryland. It arrives about May 1, and is occasionally observed until the latter part of August. The presence of juvenile birds proves this species breeds in or near this locality.

Yellow Warbler (*Dendroica aestiva aestiva*)

An uncommon summer resident, although numerous during migration. Observed from May 15 to September 18. On May 15, 1933, I discovered a nest of this species in a crotch of a small shrub about eight feet from the ground on the bank of a small mill race near Avalon, Maryland. A pair of adult Yellow Warblers was nearby. When I returned to this spot on the 18th I found the nest partially dislodged. The birds were not observed although I watched this spot carefully on several later trips. The nest was a beautiful, cup shaped affair of plant fibers and grasses.

Northern Pine Warbler (*Dendroica pinus pinus*)

The Pine Warbler is the first of the warblers to arrive in the Glenartney, Maryland, area. About the first week in April I look for them and have not been disappointed. They may be found in or near the pine woods until the middle of the summer. My breeding records for this species are incomplete and I hope to present more complete notes after the coming season.

Prairie Warbler (*Dendroica discolor discolor*)

The Prairie Warbler is the latest addition to my list of the *Compsothlypidae* family. My records show only one observation, made on June 11, 1933, at Cove Point, Maryland, where I observed a pair feeding several nestlings that were barely able to fly. They were unafraid and carried on their parental duties within a dozen feet from where I stood. After being fed they hopped through the underbrush after the adult birds.

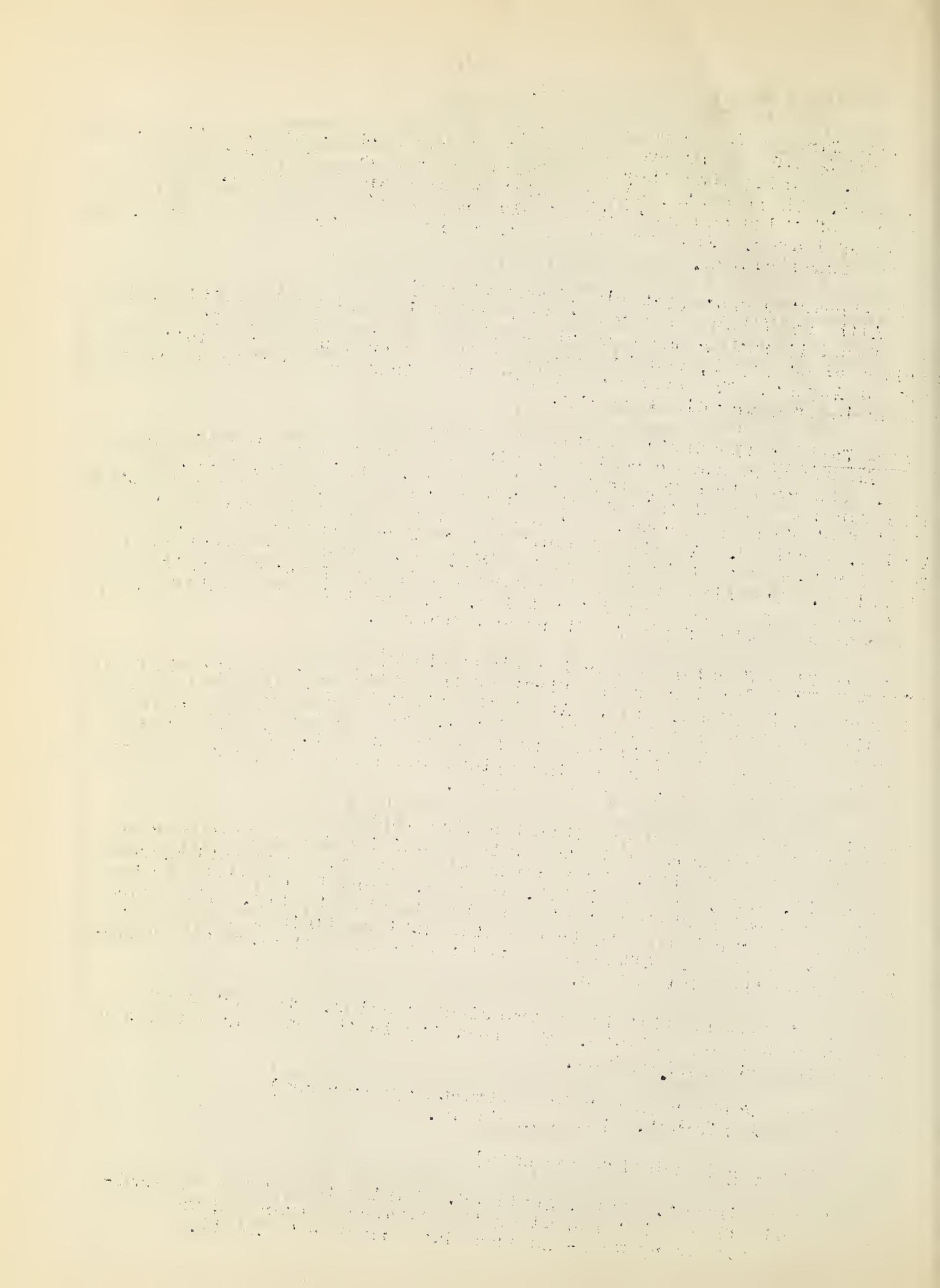
The following list is of transient species. The dates of appearance are approximate. The locality is the same as noted before - Glenartney, Maryland.

Yellow Palm Warbler (*Dendroica palmarum hypochrysea*)

Uncommon migrant. Date, April 19.

Myrtle Warbler (*Dendroica coronata*)

Common migrant. Date, April 26. During the winter of 1931-1932 a small flock wintered along the Patapsco River and was observed nearly every week-end from late October to April.



Magnolia Warbler (*Dendroica magnolia*)

Common migrant. Date, May 3.

Bay-breasted Warbler (*Dendroica castenea*)

Common migrant. Date, May 17.

Blackpoll Warbler (*Dendroica striata*)

Common spring migrant. Date, May 23.

Uncommon fall migrant. Date, October 16.

Cape May Warbler (*Dendroica tigrina*)

Uncommon migrant. Date, May 13.

Black-throated Blue Warbler (*Dendroica caerulescens caerulescens*)

Common spring migrant. Date, May 23. Males observed at first; females usually arrive about one week later.

Uncommon fall migrant. Date, September 18. Both sexes appear at same time during this migration.

Blackburnian Warbler (*Dendroica fusca*)

Common spring migrant in 1933. Date, May 13.

Black-throated Green Warbler (*Dendroica virens virens*)

Common spring migrant in 1933. Date, May 13.

Wilson's Warbler (*Wilsonia pusilla pusilla*)

Common spring migrant. Date, May 17.

Canadian Warbler (*Wilsonia canadensis*)

Common spring migrant. Date, May 17.

Hooded Warbler (*Wilsonia citrina*)

Common spring migrant. Date, May 8.

To the student of ornithology the study of the life histories of the Compothlypidae is of unusual interest. The notes recorded above have aroused my interest to such an extent that I am undertaking a further and more complete study of this family.

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SPRING BURNING DESTROYS WILDLIFE

It is very unfortunate that the landowners and tenants of our state, as a rule, annually burn over areas on their property of brush, weeds, etc., especially during the spring season. This spring burning is one of the most destructive agents to wildlife and especially to all ground-nesting birds and animals. Great destruction is also caused by carelessness of those in charge of the burnings, by allowing the fire to get away from them, often damaging their neighbor's property. We have annually pointed out to the public the destructiveness of spring burning. However, many believe that the burning causes grass to grow quicker. The scientific experts on agriculture have repeatedly shown that it does not and that the fire often destroys the roots and in all cases weakens the plant. Hence, spring burning defeats the purpose the landowner would have it serve.

Spring burning destroys nesting covers, nests and young and

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often mother birds upon them, and baby cotton-tail rabbits are destroyed in their nests. If you have dense broom-sedge growth that you feel needs burning, then it should be under careful supervision and only thinned out, leaving patches for nesting birds, as small patches of thin growth of broom-sedge are very desirable as nesting areas for bob-white.

If you desire to eliminate weeds and broom-sedge from your areas, plowing is by far the best means and if the area is not planted in crops, new growth will come back and furnish food and cover for the following Fall and Winter for wildlife.

If you anticipate cutting over your area this spring, by all means use the famous "flushing bar", which is a very simple arrangement----take a long pole and lash it to the yoke and extending to the right, in front of the flushing bar, draping the pole with burlap sacks, using stone or iron to weight the sacks at the bottom or ropes attached to the pole with iron at bottom as weight. In this manner, birds or animals either nesting or feeding on the area will be flushed before the cutting blade reaches the point where the bird or animal is. Wherever this system has been used, thousands of birds and small animals have been saved.

Maryland, without a question of doubt, has the best muskrat areas of the Atlantic Coast. The entire Chesapeake Bay country furnishes excellent breeding areas for Maryland's famous black muskrat and a great many of the marshland owners have a habit of burning these areas annually which is very detrimental indeed to this great little fur-bearing animal, oftentimes destroying their homes and we advise if you desire to eliminate certain homes on your marshes, tear them down instead of burning the area. The burning of these marsh areas is also very destructive to the nesting areas of the famous black duck and blue-winged teal which breed in the muskrat marshes.

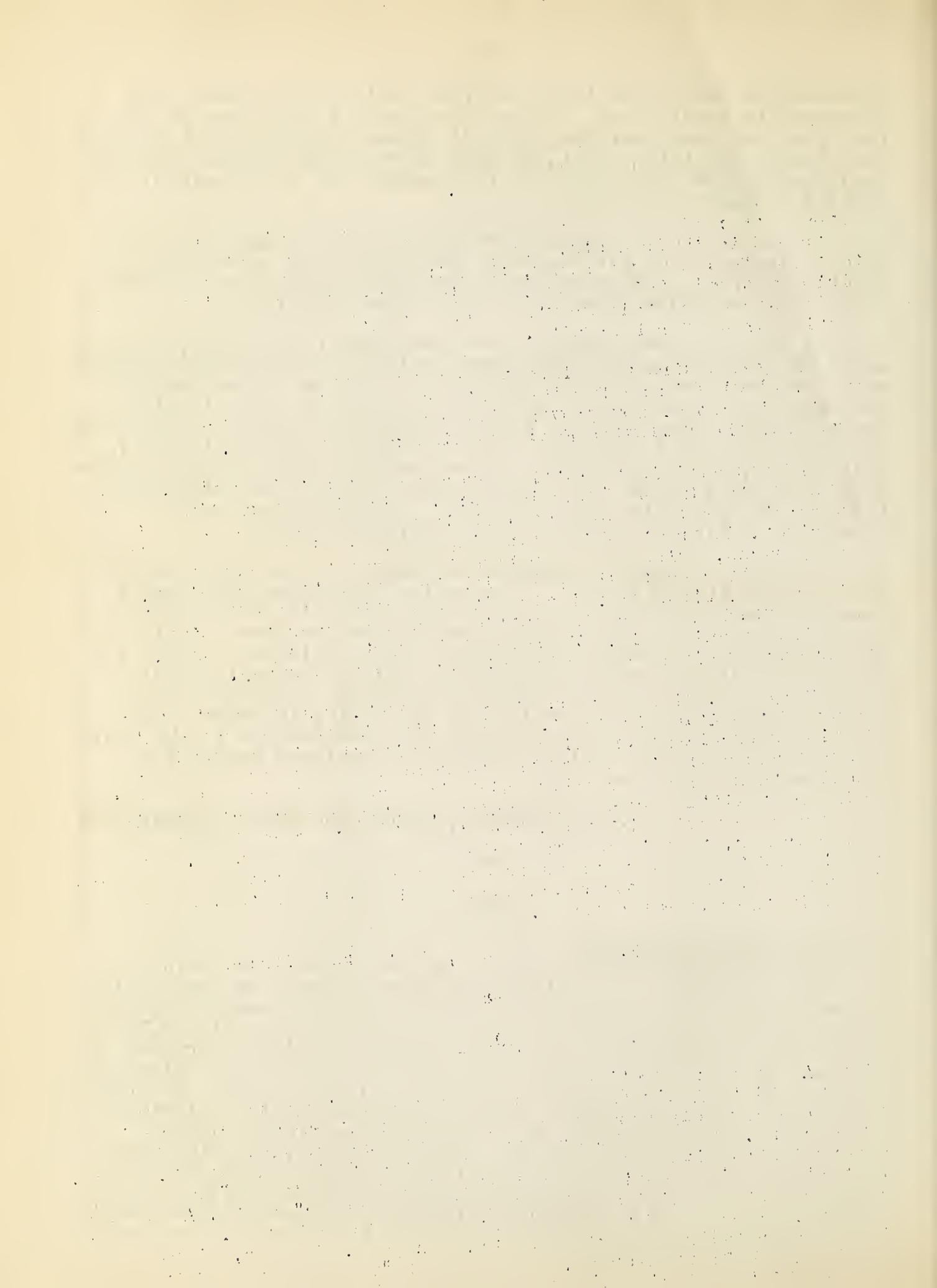
E. Lee LeCompte, State Game Warden of Maryland

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#### NOTES

##### Fifth Anniversary Meeting

The Fifth Anniversary Meeting of the Society was held in the large assembly room of the Enoch Pratt Library on the evening of March 27. The two hundred and seventy people present enjoyed a very instructive program arranged by the chairman, Elra M. Palmer, featuring an interesting illustrated lecture entitled "Travels of a Naturalist in Haiti and the Dominican Republic" by Dr. Alexander Wetmore, Director of the United States National Museum. Interesting shorter talks were given by Dr. Joseph L. Wheeler, Librarian of the Enoch Pratt Library, who spoke of "The Library and the Natural History Society," by Dr. J. Carey Taylor, Superintendent of Secondary Education of the Baltimore Public Schools, who spoke on "The Possible Value of a Natural History Organization to the School System," and by Edmund B. Fladung, President of the Society, whose subject "After Five Years" embraced the history, work, and aims of the organization.



Meetings of the Society

March 3 - Junior Meeting. Talk by Ned Crosby entitled "Practical Applications of Fluorescence."

March 6 - General Assembly. Talk by Albert Rubenstein - "Semi-precious Stones in Relation to Archaeology." Illustrated.

March 13 - General Assembly. Talk by W.B. Tyrrell - "The Starlings as a Menace."

March 17 - Junior Meeting. Talk by Earl Palmer - "Preservation of Botanical Material."

March 20 - Annual Meeting. Departmental reports read by curators of various departments. Programs for coming year outlined.

March 27 - Fifth Anniversary Meeting. (Reported elsewhere).

Departmental Meetings

March 7 and 14. Entomology.

March 12 and 26. Paleontology.

Lectures to Outside Organizations

March 1 - State Normal School at Towson. Lecture by Elra M. Palmer - "Interesting Young People in Natural History, Discussed from a Teacher's Point of View." Illustrated.

March 2 - Gilman Country School. Lecture by Elra M. Palmer - "In Quest of Natural History." Illustrated.

March 4 - Young Peoples' Guild, First Unitarian Church. Lecture by Robert Wheeler - "Fossils of Maryland." Illustrated.

March 15 - Gilman Country School. Lecture by Elra M. Palmer - "Collecting in the Various Fields of Natural History." Illustrated.

March 15, 16, 19, 20, 21, 22, 28 - Baltimore City College. Sixteen lectures to different groups by Richard Webster - "Insects Representative of Various Orders, Mimicry, Coloration."

March 22 - Scout Troop 39. Lecture by Eugene R. Polacek - "Life Histories of the Mosquito and Silk Worm."

Exhibitions

March 12 - 26. Exhibition of Indian Artifacts in connection with the Maryland Tercentenary exhibits at the Enoch Pratt Library. The feature of the exhibit was the model of an old Maryland Indian village by Richard E. Stearns and Milton T. Oler of the Department of Archaeology.

March 26 - April 14. Exhibit at Enoch Pratt Library featuring Maryland trees. Held in connection with Arbor Day. Also another exhibit at the Enoch Pratt Library - featuring Maryland spring birds.

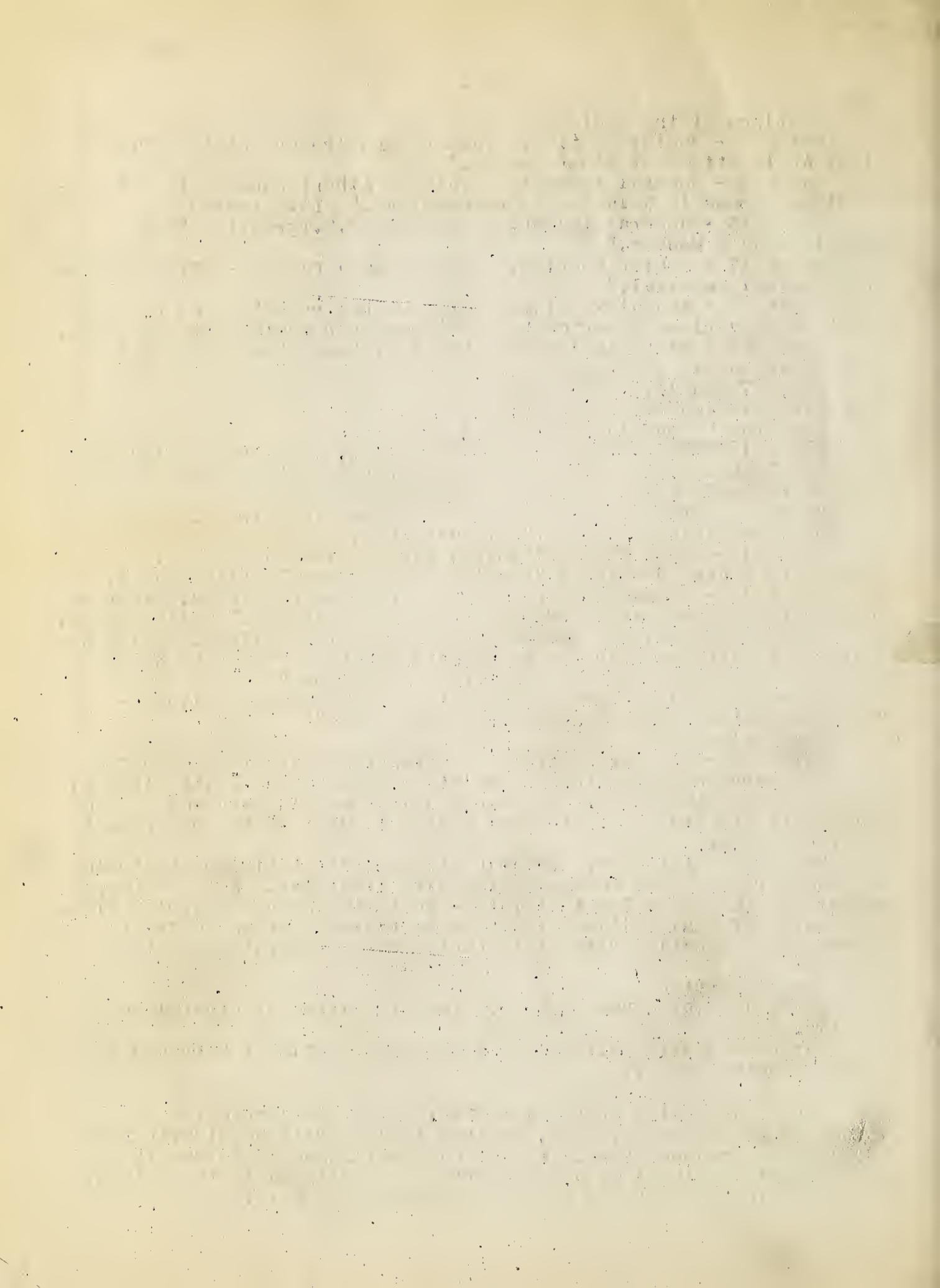
March 27 - Exhibition of Nature Photographs at Enoch Pratt Library in connection with Fifth Anniversary Celebration of the Society.

School Service

March 16 - Bryn Mawr School. Identification of Minerals and Fossils.

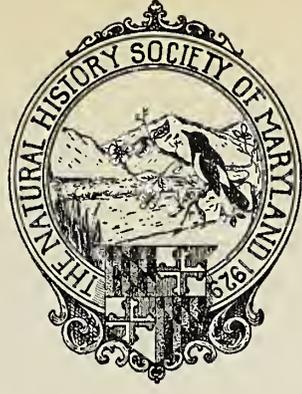
March 15 - Gift collection of Miocene fossils of Maryland to Gilman Country School.

Save your copies of the Bulletin. Upon the completion of Volume IV in September, 1934, printed folders will be distributed to those who request them. Also, the final issue of Volume IV will contain an index of all the articles published in the Volume. The Bulletin may be bound and preserved in book form.

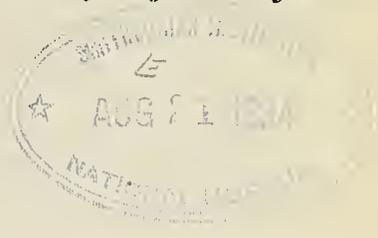


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*The Natural History*



*Society of Maryland*



# BULLETIN

Volume IV

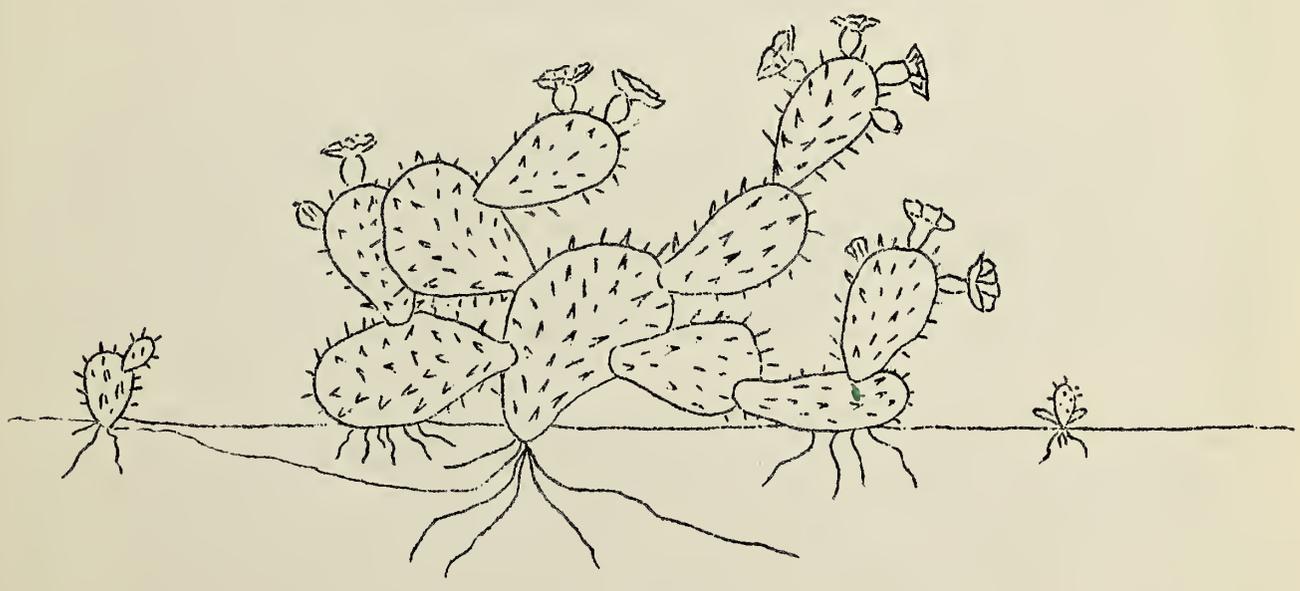
APRIL , 1934  
Herbert C. Moore , Editor .

Number 8

## MARYLAND CACTI

By Charles Svec

When the word cactus is mentioned one's mind naturally turns to the semi-deserts of the Southwest, Mexico, or the country of the Andes in South America. Yet if we are observant as we roam about in the more barren fields of Maryland, we shall find many cacti, especially in Southern Maryland and on the barren mountain tops. If we happen to be doing our wandering in June or July we do not have to be so observant, for the large, golden, waxy blossoms, rivaled in beauty only by the orchid, stand out to mark the existence of the lowly weed so cursed by man and avoided by beast. This bloom is only to be admired from a distance. The plant seems to resent its curse and challenges anyone to touch its blossom. If you do, you will spend many days trying to remove the



*Opuntia opuntia*



tiny spines from your hand.

All cacti found in Maryland are *Opuntia* - *Opuntia opuntia*, *Opuntia humifusa*, and others. They are all very closely related and only the trained eye can tell the difference, so let us call them prickly pears or Indian figs. They are a low-growing, spreading plant, often forming clumps three feet across. Immediately attached to the root is a so called "pad". Along the margin of this pad other pads will grow, and the following year other pads will grow on these pads. Eventually the plant becomes top heavy and topples over. Where pads come in contact with the soil they root and thus the cactus spreads.

In the late winter the fruit becomes ripe. It resembles a fig in appearance and has a sweet, slimy taste. The flesh is then a beautiful red. If the Indians still existed here they could tell us how to make some tempting wholesome dishes from this fruit.

Anyone interested in the wonders of nature should plant a few prickly pear seeds in a box of sand and loam. To see a cactus sprouting is most fascinating. First come two seed leaves like any other plant. Then the little fuzzy ball begins to form between the leaves. In a few months a pad is formed and the seed leaves drop off. Then we have a full fledged cactus.

Practically all cacti, wherever found, have little or no disease. Their greatest enemy is rot. This is especially true of desert cacti. Our wet winters would quickly destroy them. Nature has taken care of our prickly pear, however. In winter when the ground is either frozen or soaking wet, this plant assumes a shrivelled and dead looking appearance and refuses to take moisture.

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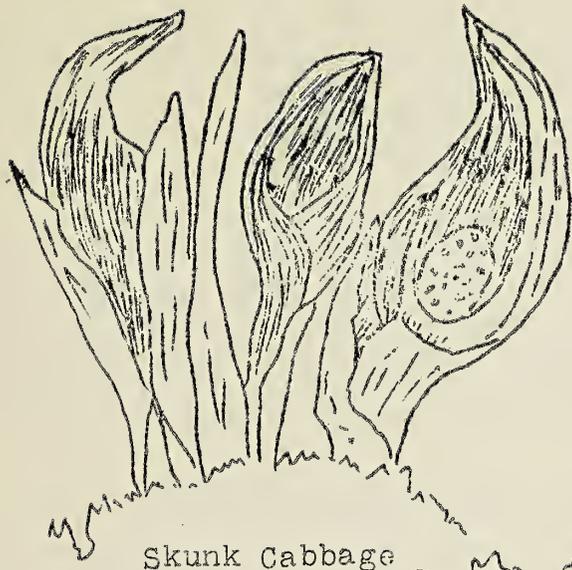
## EARLY SPRING FLOWERS

By Joseph C. White

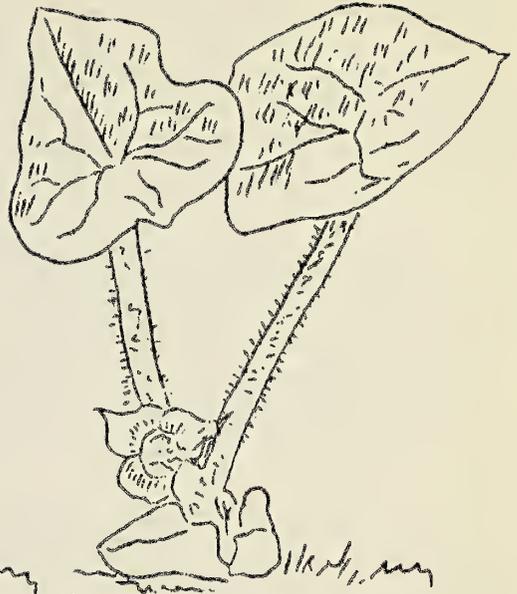
In the spring when the early flowers appear, the country is at its peak of beauty, and the new leaves have a fresher and prettier green color than at any other time of the year. After the flowerless winter, they appeal to us especially, perhaps more than in any other season. There are so many species of plants in bloom at this time of the year it would be a very difficult task for anyone to observe them all in one season, so let us take one location and see what is there.

About one mile above Orange Grove, Maryland, on the Patapsco River, is a small stream that wanders up through the hills back into the country. Let us walk to this place anytime around the last of April or the first of May. The Laurel is growing here and there over the upper parts of the hills among the trees, and in the shady, damp spots you will see mosses and lichens, and on the bank the remains of Christmas Ferns from the past summer. Along the stream in marshy spots will be seen clumps of Skunk Cabbage (*Symplocarpus foetidus*). At this time the plant is only about nine inches high, and by pulling apart the leaves, the hidden spadix may be seen.





Skunk Cabbage



Wild Ginger



May Apple



Dog-Toothed Violet



Early Saxifrage



Looking above the high water-mark of the stream one will see plants of the Wild Ginger (*Asarum canadense*) scattered here and there in cool, damp, shady spots. This is another plant at which one must look twice to see the dull brown flower. It grows at the base of the plant and is very inconspicuous in color.

The May Apples (*Podophyllum peltatum*) as usual are present in large numbers, furnishing blankets of green over most of the surrounding hillsides. The white flowers will not appear yet for a few weeks. A plot of these plants looks very much like a forest of palm trees, making damp, shady spots, where later in the season the Broom-rape (*Orobanche uniflora*) will grow in plenty.

Among the May Apples you will see the Hepatica (*Hepatica triloba*). At this time of the year the flowers are starting to wane, but the ones that remain seem to be larger and more brilliant in color than the early blossoms. Another favorable habitat of this plant is the old leaves upon the ground, and in early spring all you can see above them are the flowers. Some blossoms are white and other lavender, while others are a combination of the two.

All along the lower parts of the hills, close to the stream one will see many Dog-Toothed Violets (*Erythronium americanum*). The golden-yellow, lily-like flowers are very conspicuous, and the two basal leaves are green with reddish-brown markings. Growing near the Dog-Toothed Violets is the Spring Beauty (*Claytonia virginica*) with the pink and white flowers. These two flowers make a very pretty floral display.

Scattered over the hillsides will be seen the Early Saxifrage (*Saxifrage virginensis*). This plant grows everywhere in profusion. Although the white flowers are very small, they add greatly to nature's picture.

If one were to visit this spot just one month later he would see an entirely different scene, for many other flowers would be in bloom.

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#### NOTES

##### Trustees Meeting

The quarterly as well as the annual meeting of the Board of Trustees was held on April 1, 1934. In addition to the routine business of the Board, the reelected trustees, Mr. Gilbert C. Klingel, Mr. Edward McColgan, and Mr. Herbert C. Moore, and the reelected officers, Mr. Edmund B. Fladung, president, Mr. Gilbert C. Klingel, vice-president, Mr. Elra M. Palmer, secretary, and Mr. Edward McColgan, treasurer, were installed.

The most important business of the meeting related to the extension and enlargement of the program for the coming year.

##### Meetings of the Society

On April 10, the Society had the pleasure of hearing an interesting lecture by Dr. R.V. Truitt entitled "The Blue Crab of the Chesapeake Bay." The lecture was illustrated by motion pictures, some of which had been taken by Mr. Gilbert Klingel of our Department of Marine Research.

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On April 24, Mr. Daniel Shipley presented a very delightful lecture, the subject of which was "Native Wild Flowers and Shrubs."

April 3 - General Assembly. Talk by Mr. Milton Oler - "Indians of Maryland." Illustrated.

April 17 - General Assembly. Talk by Mr. Elra M. Palmer - "Carnivorous Plants of Maryland." Illustrated.

April 7 - Junior Meeting. Talk by Richard Webster - "Work of the Department of Entomology."

April 21 - Junior Meeting. Short talks by John Lutman - "The Periwinkles," Clyde Reed - "Winter Fungi," and L. Znaimerowski - "Calcium and Its Compounds." These talks were illustrated with specimens.

#### Departmental Meetings

April 13 and 27. Botany

April 7, 11, 18, 25. Entomology

April 25. Ornithology

April 9, 23. Paleontology

#### Exhibitions

April 11-25. Exhibition of nature photographs of mammals, birds, reptiles, batrachians, insects, and plants at the Gilman Sountry School.

April 4-8. Exhibit at the Baltimore Flower Show depicting a forest scene in early spring with plants, birds, insects, and reptiles of the season. This exhibit attracted much attention and the officers of the Flower Show have requested the Society to prepare a similar exhibit for next year's Flower Show.

April 16-30. Exhibit at the Enoch Pratt Library, featuring the collecting and preserving of insects.

April 23. Exhibit at the Friends School of our Maryland Indian Village and Indian artifacts - in conjunction with the Tercentenary of Maryland.

April 5. Exhibit of fossils at School No. 63.

April 27. Exhibit of Minerals at St. Johns M.E. Church Club.

#### Lectures to Outside Organizations

April 21 - Enoch Pratt Library. Lecture by Elra M. Palmer - "Nature Trails in the Spring." This was the first of a series of four illustrated lectures for the students of the Baltimore High Schools.

April 28 - Enoch Pratt Library. Lecture by Mr. Edmund B. Fladung - "Our Maryland Birds." Illustrated. The second lecture of the series.

April 12 - Baltimore City College Chemistry Club. Lecture by Ned Crosby - "The Fluorescence of Minerals." Illustrated.

April 17 - School No. 63, Fourth Grade - Lecture by Mr. Earl H. Palmer - "The Cecropia Moth and Its Metamorphosis." Illustrated.

April 20 - Clifton M.E. Church. Lecture by Mr. Woodward Burkhart - "Indian Artifacts." Illustrated.

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#### BOOK REVIEWS

Small, John Kimkel--"Ferns of Florida"

N. Y. The Science Press 1931

237 pages

"Ferns of Florida," a gift to the Enoch Pratt Free Library by Mrs. Joseph L. Wheeler, is one of the finest books of its kind that I have had the pleasure of reading. Mr. Small, the author, is the Head Curator of the Museums and Herbarium of the New York Botanical

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Garden.

In Florida one can collect ferns the year round. There are "107 species growing naturally within this political subdivision of the United States. They fall into 6 orders, 14 families, and 48 genera."

Following the List of Illustrations, there are eighteen pages devoted to the general description of the ferns in relation to the physiographic divisions of the state, such as the pinelands, prairies, woods, hammock, marshes, swamps, and sand dunes. Each of these divisions is spoken of individually and a list of ferns given which can be found in the particular region under discussion.

There are 217 pages devoted to the description of the 6 orders: namely, Ophioglossales, Filicales, Salviniiales, Lycopodiales, Isoetales, and Equisetales. This is followed by a three page list of authorities, five pages of glossary notes, and a four page comprehensive index.

The descriptions of the ferns and their allies consist of a short statement concerning the rootstocks, leaves, length of the fronds, the general appearance of the specimen, and a detailed description of the sori. This is followed by a short paragraph describing its natural habitat and range.

Earl H. Palmer, Department of Botany.

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"Elements of Botany"--Holman and Robbins,  
Second Edition-1933,  
John Wiley & Sons

This tex-book, written by two well known authors is indeed a very good book for beginners in the botanical field. The subject matter presented is not only well organized but is expressed in a concise understandable manner. Scientific terms or phrases of importance are in heavier print and each term is clearly explained.

Part One of the book is devoted to a study of the various parts of a typical flowering plant. This material is presented in sufficient detail as to give the student a good knowledge of the essentials of botany.

The other half of the book considers life histories and examples of the various groups in the plant kingdom. The system of classification employed is, to be sure, a simple one. The book offers a profusion of illustrations, most of which are rather good, although there are the usual diagrammatic illustrations which seem to be traditional in books of this nature.

A new feature is embodied in the binding which is water proof. This new method of pyroxylin impregnation of the cloth, which makes the finished binding completely waterproof, is a great help to students working in laboratories and workrooms where textbooks are needed for reference.

Elra M. Palmer.

The first part of the report deals with the general situation of the country and the progress of the work during the year.

The second part of the report deals with the results of the work done during the year and the progress of the various projects.

The third part of the report deals with the financial statement and the accounts of the work done during the year.

The fourth part of the report deals with the conclusions drawn from the work done during the year and the suggestions for the future.

The fifth part of the report deals with the list of names of the persons who have taken part in the work.

The sixth part of the report deals with the list of names of the persons who have been consulted during the work.

The seventh part of the report deals with the list of names of the persons who have been consulted during the work.

The eighth part of the report deals with the list of names of the persons who have been consulted during the work.

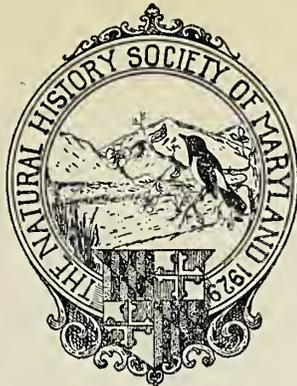
The ninth part of the report deals with the list of names of the persons who have been consulted during the work.

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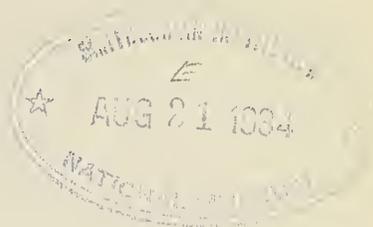
The eleventh part of the report deals with the list of names of the persons who have been consulted during the work.

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*The Natural History*



*Society of Maryland*



## BULLETIN

Volume IV

MAY, 1934

Number 9

Herbert C. Moore, Editor

### THE PITCHER PLANT (*Sarracenia purpurea*)

By Elre M. Palmer

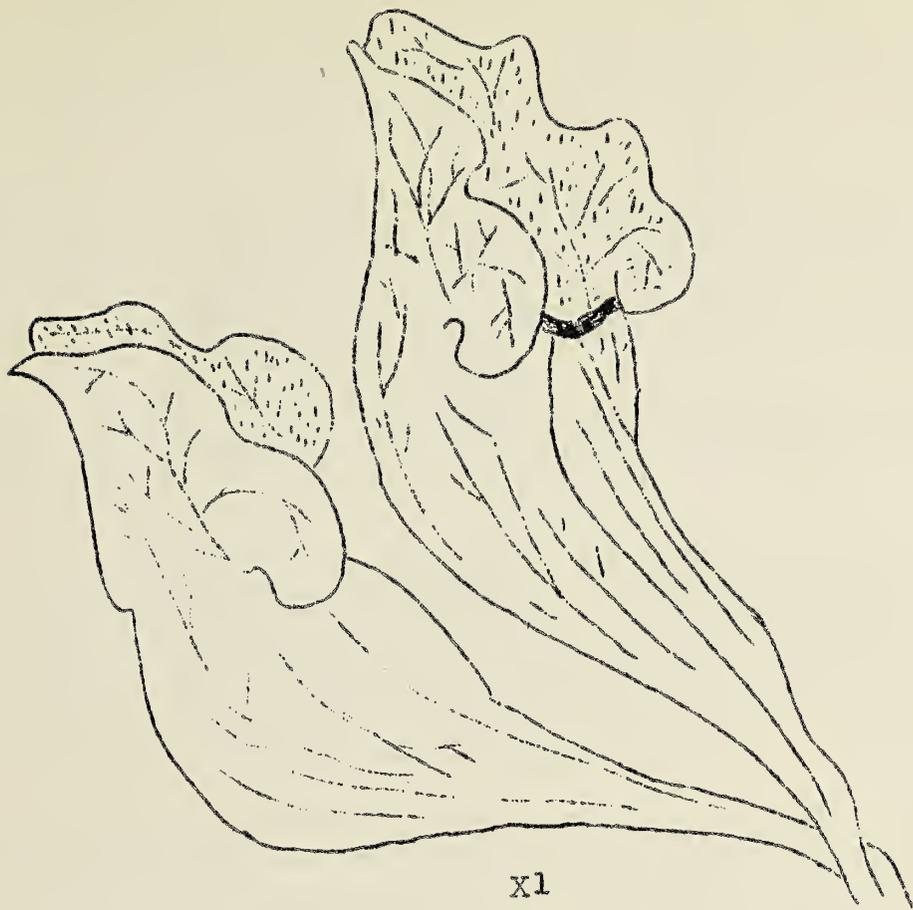
The pitcher plant, although a rather common inhabitant of fresh water bogs in Southern Maryland, is rarely seen by the casual observer. Perhaps it is frequently overlooked because it grows snuggled down in carpeted bogs of peat moss and drooping ferns, and is passed unnoticed. It is occasionally found growing in association with the Sundew (*Drosera rotundifolia*, L.)

The Huntsman's Cup, as the Pitcher plant is sometimes called, is certainly one of the most interesting plants found among our wild flowers. It is indeed a peculiar form, and is classed as an insect-eating plant, or in other words, a carnivorous plant.

The leaves are very striking both in shape and color. They grow from the root stock in a basal rosette, usually of five pitcher-shaped broadly winged leaves. (Figure 1). The leaf is green in color and the venation is usually very distinct, being a dull red to reddish purple in color. The pitcher-like leaves attract one's attention, not only because of their graceful form, but also by the pitfalls which they set for unwary insects. The leaf has a sugary exudation which apparently attracts the insects. The wings of the leaf are covered with stiff, downpointed bristles which prevent the escape of such insects that may be attracted to the plant. It is seldom that one finds a plant whose leaves are not partially filled with water and insects.

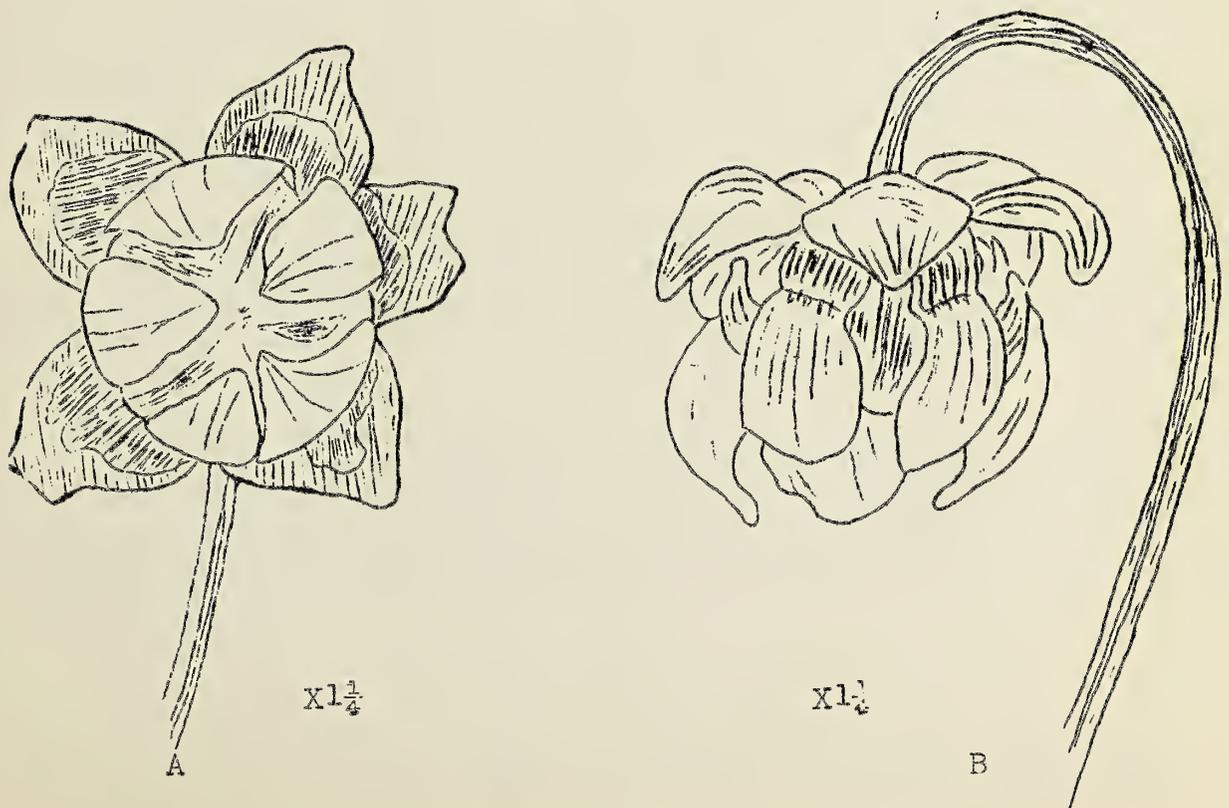
Among the fifty some odd plants which the author has examined, it was found that the little midges were the most common victims. Flies and beetles were next in number; ants, spiders, bees, and an occasional small dragon fly or moth completed the list of insect victims. The largest number of insects that I found in any one leaf was thirty-eight, the majority of which were midges, ants, and small beetles; two small moths were also found in this particular leaf. (1)





x1

Figure 1



A  $x1\frac{1}{4}$

B  $x1\frac{1}{4}$

B

Figure 2



Apparently the soft parts of the trapped insects are digested by enzymes which the leaf exudes into the water of the pitcher-like container. Hepburn et al believe they have found in the pitcher liquid the enzyme protease. (2) The exact mechanics of this process is still unknown. According to Lloyd, absorption occurs most readily at the base of the pitcher.(3) It is believed, however, that these insect bodies are the chief source of nitrogenous nourishment of the plants.

Pitcher plants can be transplanted and grown under artificial conditions with much success, provided they are given a good supply of water and are kept in a relatively high humid atmosphere. The rosette growth of the leaves however, is not as regular as in nature. It is also essential that the plants be potted in bog soil, which usually has a rather high acidity.

The Pitcher Plant, aside from its peculiarly interesting leaf form, produces a flower which is equally, if not more attractive, than its leaves.

The plant blooms in its natural habitat at the end of May or in June. The flower is difficult to describe and to draw. Figure 2 shows two views of the flower. (A. a view looking directly into the face of the flower; B. the natural position.) The flower varies in size from an inch and a quarter to two inches in diameter. It is a greenish-purple flower with red petals which arch over the greenish-yellow umbrella-shaped style.

The scape or flower stalk is naked, one-flowered and varies from eight to twelve inches in height. The calyx is made up of five greenish purple sepals (Figure 5) with three bractlets at its base. Five fiddle-shaped, pink to dull red petals arched over the style make up the corolla (Figure 4). The stamens (Figure 6) are numerous. Examination of three flowers shows the average number of stamens to be seventy-five. There is but one pistil (Figure 7) having a fairly large round compound ovary and a short style. A cross section of the ovary discloses five cells with innumerable ovules (Figure 8). The summit of the style is modified into an umbrella-shaped body with five points. Within each of these points is a small delicately hooked stigma.

Here is a flower with excellently adapted parts to insure self-pollination. Figure 3 illustrates a partially dissected flower showing the stamens and pistil as well as the umbrella-shaped style which holds the ripe pollen grains as they are discharged from the anthers.

The flowers studied have been raised under artificial conditions. The plants were partly covered with large glass bell jars in order to insure a high humidity. The remarkable rapid growth of the scape has also afforded a source of interest and a chart of growth with regard to temperature and number of hours of direct sunlight has been made for the plants.

#### Citations and References

- (1) Hegner, R. Biol. Bull. Vol. 50, 1926
- (2) Hepburn, J.S. St. John, and Jones. Biochemical Studies of the North American Sarraceniaceae. Trans. Wagner Free Inst. Sci. Phila. 11., 1927

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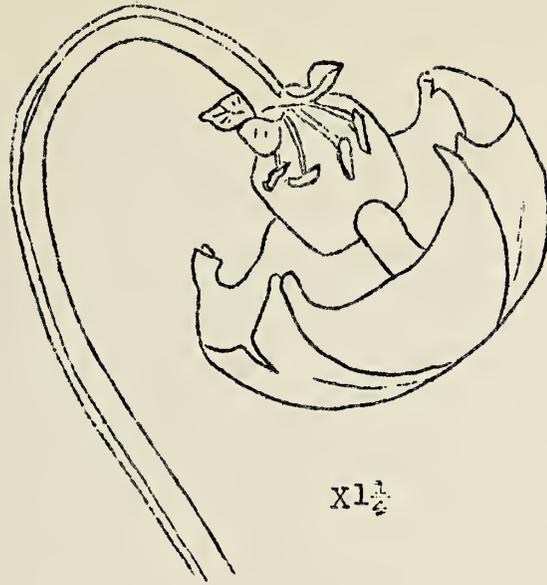
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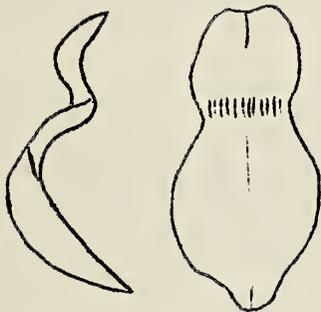
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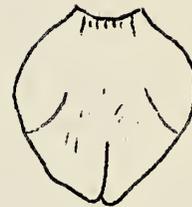
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Figure 3



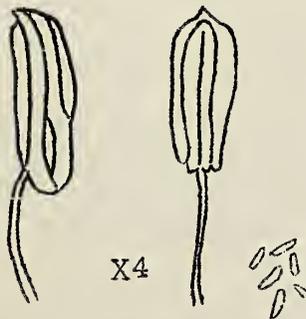
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Figure 4



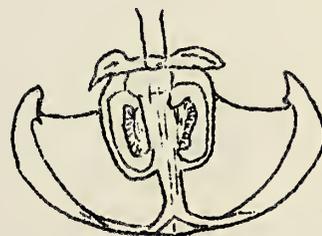
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Figure 5



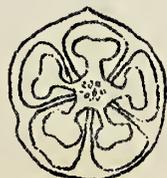
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Figure 6



X1 1/2

Figure 7



X2

Figure 8



- (3) Lloyd, F.E., The Carnivorous Plants-A Review with Contributions. Trans. Royal Soc., of Canada. 3rd series Vol. XXVII., 1933
- (4) Shreve, F., Botanical Gazette, Vol. 42-Aug. 1906., Development and Anatomy of *Sarracenia purpurea*.

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## NOTES ON THE FEEDING HABITS OF THE GLASS PRAWN

By Gilbert C. Klingel

On June 10, 1933, an immature silverside (*Menidia*) was noted in a dying condition in an aquarium in the writer's laboratory. While still moving it was attacked by a glass prawn (*Palaemonetes vulgaris*), which seized the fish, tore out the eyes, and immediately devoured them. The eyes were shredded bit by bit from their sockets by the clawed legs (Chelapods) and transported thence to the mouth. The body of the fish was then turned tail upwards so that the stomach was pressed against the mouth of the crustacean. A hole was bitten through the thin membranes lining the abdomen and the contents sucked out. The entire procedure consumed five minutes. Glass prawns are perfectly transparent, and the food could be seen entering the mouth, and passing into the body where it collected in a little sac in the anterior portion of the thorax.

Digestion in this prawn seems to be fairly rapid, for three hours later the body was again transparent and the accumulated food disposed of.

By way of experiment, four prawns and as many dead fishlets were placed in an aquarium. One prawn did not feed at all but the others soon consumed the eyes and stomachs of the dead fishes. Temporarily satisfied the prawns discarded the empty husks of the dead fishes, retired to a corner and remained quiescent. Later, however, all four prawns were observed feeding on the carcasses.

This peculiar preference for eyes and stomachs has been recorded in other organisms higher in the scale of life than the crustacea. A notable example is the turkey vulture. Perhaps the explanation may lie in the fact that these organs are richer in organic salts and in flavor than other portions of the body.

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## A NEW MINERAL FROM THE JONES FALLS AREA

On April 29, 1934, the Department of Mineralogy made a trip to the Davis Trap Quarry at Woodberry, operated by the T.C. Davis Company. The Quarry is in gabbro 500 yards north of Woodberry on the west bank of Jones Falls, just at the Pennsylvania Railroad Trestle.

Here in the face of the gabbro, in a vein of white compact laumontite was found trapezohedral crystals of analcite associated with calcite. The crystals of analcite are of a yellowish white color ranging in size from a quarter of an inch to one and one quarter inches. Excellent specimens showing the crystal forms were collected. We believe this to be the first official report of analcite having been found in this area.

A. Llewellyn Jones, Department of Mineralogy.

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## SOME RECENT NOTES ON MARYLAND LIMESTONES

By Walter E. Price, Jr.

With the passing of the last few weeks the Department of Mineralogy has begun its spring field work. The most interesting developments have been in the study of the Cockeysville marble areas. More success has been met with in this territory than we have heretofore had. To our check list of Maryland minerals we are recording four species from the Cockeysville marble, nearly completing the present known list.

The Cockeysville marble is a completely crystalline marble of variable grain. It ranges from a fine grained marble, to a coarse, sugary rock, locally called "alum stone". Irregular outcrops occur over the whole central part of Baltimore County. In many places the marble grades into dolomite (magnesium limestone), but it is impossible to sharply define the change. In some places the marble contains abundant brown phlogopite mica, which sometimes occurs in wavy bands, showing that the rock was once subjected to high pressure. The quarries in this district have been famous for the fine building stone which has gone into the construction of beautiful architectural masterpieces, such as the National Capitol, the United States Post Office, the Washington Monument, and many government buildings in Washington, D.C.

It is the Texas-Cockeysville area in which we have done most of our work. In all the Texas quarries magnificent specimens of white radiating tremolite (a silicate), which stand out beautifully against the white marble, have been found. The most sensational find was a specimen containing 1/4 inch crystals of scapolite (a complex silicate) with a vein of pyrite (iron sulphide) running through it. The scapolite has a bluish-gray tint, which with the yellow pyrite, affords a striking contrast to the snow white of the limestone. A still more wonderful effect is produced when the specimen is exposed to ultra-violet rays, - then the scapolite crystals fluoresce a brilliant yellow, while the rest of the specimen remains inert. Only one specimen of this mineral was collected, and that, from the quarry of the Maryland Calcite Company at Texas. Just adjacent to this is another called the Campbell Quarry. From here was taken a specimen of brown tourmaline crystal embedded in white marble; it was 1/2 inch thick and only one specimen was collected. In the same quarry a rare green variety of common mica called fuchsite was collected. It was found occurring with fine crystals of brown phlogopite mica. The brown and green micas are additional examples of the splendid color contrasts so characteristic of the minerals of this section.

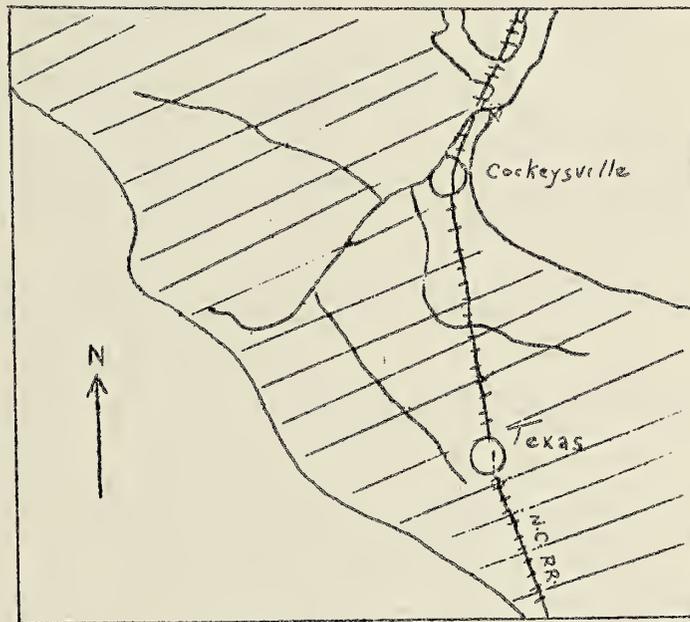
In a carbonate sand pit, just a little north of the junction of the Texas and York Roads, was found a very interesting mineral called mountain leather, a peculiar kind of asbestiform amphibole. In the soft rock it is found in pliable, fibrous sheets resembling kid leather, hence the name. Another mineral, a calcium silicate called wollastonite, is found here also, but the best specimens were collected from the famous Beaver Dam Quarry at Cockeysville.



Its yellow tinted masses have a peculiar pearly luster on the rough surfaces after being fractured, so that it is easy to distinguish the mineral from the limestone.

Further south in the McMahon Quarry not far from Smith Avenue, near Mt. Washington, were found some fine specimens of calcite rhombs. In veins in the limestone the calcite runs for several feet in a pure state. The white rhombs grade, in a few small pieces, to Iceland Spar, a transparent variety of pure calcite. The largest white rhomb found measured 3x4 inches.

Many of the specimens of the limestone from the Cockeysville formation luminesce after a short exposure under the ultra-violet rays. Other specimens, like dolomitic limestone, glow in the dark after being struck. This is a phenomenon called triboluminescence.



Map showing Texas-Cockeysville area. (Shaded portion shows Cockeysville marble)

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#### NOTES

##### Meetings of the Society

On May 29, members and friends of the Society heard a most enjoyable lecture by Father John A. Frisch, S.J. on "The Life History of the Hunting Wasp." The lecture was illustrated with a number of slides.

May 1 - General Assembly. Talk by Mr. Bryant L. Mather - "Some Rare and New Minerals of Maryland." Illustrated.

May 8 - General Assembly. Talk by Mr. Frank Yingling - "The Eel." Illustrated.

May 15 - General Assembly. Talk by Mr. Roger Hecklinger -



"Preparation of Paleontological Material in the Field and Laboratory." Illustrated with slides.

May 22 - General Assembly. Talk by Mr. Gilbert C. Klingel - "The Benefits I Have Derived from the Pursuit of Natural History."

May 5 - Junior Meeting. Lecture by Mr. Elmo Masters - "The Insect in the Field."

May 19 - Junior Meeting. Talk by R. Nelson Crosby - "Introduction to Dendrology." Illustrated with specimens.

#### Departmental Meetings

May 11 and 25. Botany  
 May 2, 9, 16, 23, 30. Entomology  
 May 5, 26. Mineralogy  
 May 7, 21. Paleontology

#### Lectures to Outside Organizations

May 12 - Enoch Pratt Library. Lecture by Mr. Harry C. Robertson - "The Reptiles of Maryland." Illustrated. This was the third of a series of four lectures for Baltimore High School students.

May 26 - Enoch Pratt Library. Lecture by Mr. Gilbert C. Klingel - "The Life of the Chesapeake Bay." Illustrated. The fourth and last lecture of the special series.

May 5 - Lecture to Camp Wachusett at Chesapeake Club. "Nature Study" by Mr. Elra M. Palmer.

May 6 - Holy Nativity Church, Young Peoples' Society. Lecture by Richard Webster - "Characteristics of Insects." Illustrated.

May 17 - School No. 63, Classes of the 5th, 6th, and 7th Grades. Lecture by Mr. Earl H. Palmer - "The Cecropia Moth and Its Metamorphosis." Illustrated.

May 22 - School No. 63. Lectures by Mr. Earl H. Palmer. To the 4th Grade - "The Silk Worm." To the 6th Grade - "The Mosquito." All illustrated.

May 22, 23. Baltimore City College, Biology Classes. Lectures by Carroll Wagner - "Bacteriological Technique."

#### School Service

May 8 - Gift of cocoons to 3rd Grade, School No. 63.

May 9 - Gift of two minerals to the Johns Hopkins University collection - a uranium mineral from Jones Falls and deweylite from Soldiers Delight.

May 10 - Loan of Cardinal skin to School No. 63.

May 23 - Loan of lantern slides (on birds) to Blue Ridge College.

#### Report of Meeting of the Department of Mineralogy

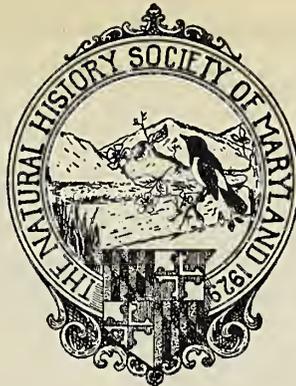
The Department of Mineralogy held its first official meeting of the new season on May 5. L. Bryant Mather, Jr., was elected secretary of the Department.

The work of the past season was briefly reviewed and several reports were read. Also the proposed program for the coming season was considered and the dates were set for the collection of material needed for exhibition work.



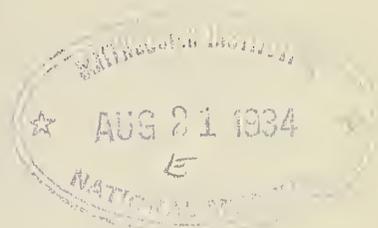
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*The Natural History*



*Society of Maryland*

**BULLETIN**



Volume IV

JUNE, 1934

Number 10

Herbert C. Moore, Editor

AN INDIAN VILLAGE SITE ON THE SEVERN RIVER, MARYLAND

By Richard E. Stearns and Woodward Burkhardt

In the spring of 1934 the Department of Archaeology excavated a small village site at Little Round Bay Creek on the right bank of the Severn River in Anne Arundel County. The site is situated in a swamp on a small natural sand knoll at the mouth of the creek (see map). A road skirting the right bank of the Severn River passes through it. When this road was erected through the swamp, the center of the knoll was removed for road ballast, destroying most of the site.

Work was begun on the east side of this road where the shell deposit seemed to cover the largest undisturbed area. At this point the deposit was about eight to ten inches thick under six inches of leaf mold.

The first few minutes of digging brought to light many fragments of pottery including the decorated fragment shown in Figure 2. The first find of importance was a three and a quarter inch bone awl made from a fragment of the leg bone of the Virginia deer (Figure 3). Further excavations unearthed a number of fragments of the vessel shown in Figure 1. About fourteen inches of the rim of this vessel were found, giving it a probable diameter of sixteen inches. Close to these fragments lay a broken clay pipe with most of the stem missing (Figure 4).

Further digging also disclosed fragments of six other vessels, bones of the Virginia deer and of small animals, one arrow point of rhyolite, and a few chips of quartz. An antler, its upper parts smashed, and with tines missing, was found too. The tines had probably been fashioned into implements.



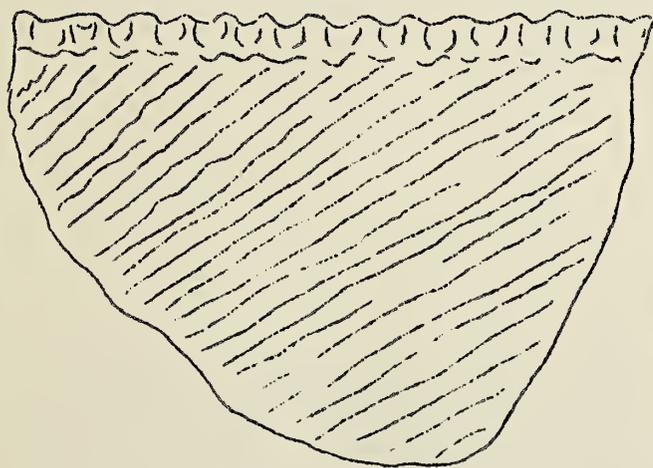
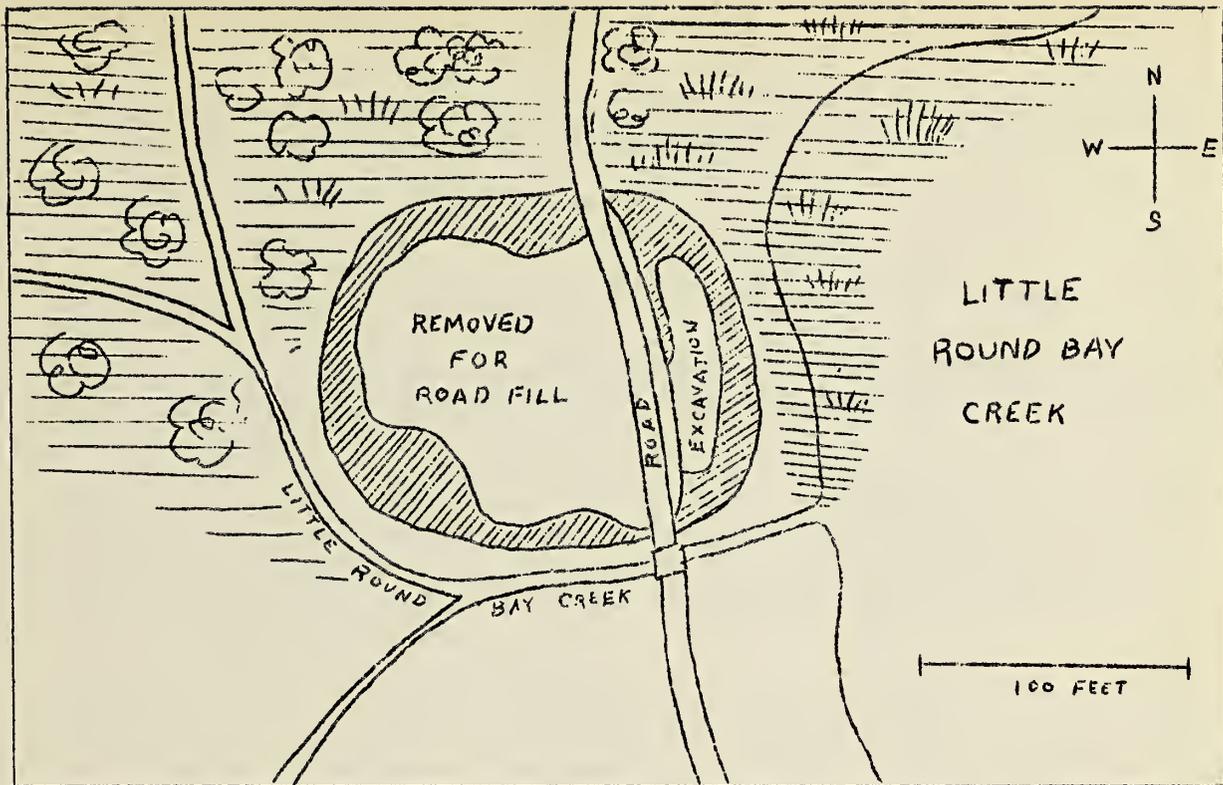


FIG. 1

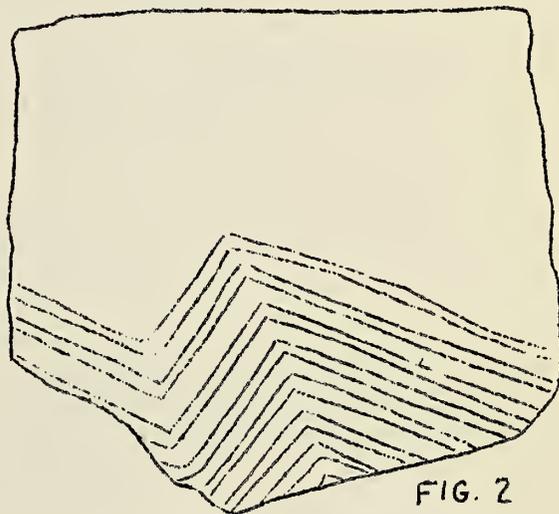


FIG. 2



FIG. 3

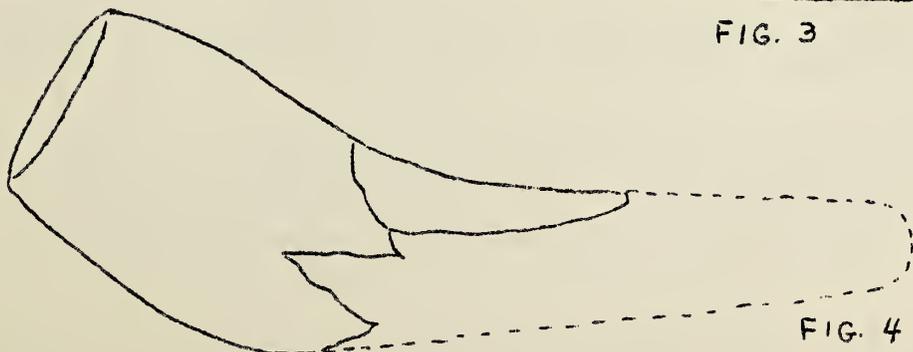


FIG. 4



A study of the pottery and other implements shows that this site was once an Algonquin village similar to others found on the rivers of Anne Arundel County.

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#### VERY RARE MINERAL FOUND AT JONES FALLS GNEISS QUARRY

The Jones Falls Gneiss Quarry, where our Department of Mineralogy has been working for sometime, yielded recently another new and rare mineral.

This mineral has just been identified as Hisingerite by the Geology Department of the Bureau of Interior in Washington. The mineralogist who examined the specimen to great length claimed that it was one of the very few times Hisingerite had been recorded in the United States.

Hisingerite is a hydrous sesquisilicate of iron. It is red in color and has a distinct cleavage in one direction while being earthy in a cross fracture. At the Jones Falls Gneiss Quarry it occurs in small masses associated with stilbite, heulandite, and haydenite. Two localities where Hisingerite is known to occur are Sodermanland, Sweden, and Bodenmais, Germany.

Charles Ostrander, Department of  
Mineralogy.

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#### THE SPARROW HAWK\*

By Henri Seibert

On May 7, I first noticed a pair of sparrow hawks flying over my head, but being preoccupied with a phoebe's nest I paid little attention to them. However, when on the following week-end and the one after that, I still saw them flying around, I surmised that they were nesting in the neighborhood.

An old dead tree, isolated in a cow pasture, first drew my attention as a likely site. Several hundred yards away, I concealed myself in a blackberry patch (a very uncomfortable hiding place) and waited. The birds used the tree as a perch, but did not attempt to enter an old hole in the trunk which had once been utilized as a nest. I realized that the nest must be elsewhere.

On June 24, I happened to look up at an old starling's nesting site under the roof of a house, when I saw four heads peering out at me. The heads darted back, but I had seen enough. Scrambling up to the roof, I looked into the hole where I saw a very dirty nest with four small birds.

The entire entrance, both floor and sides, was covered with excrement. A vile odor emanated from the nest; the entire place was filthy, but when I later picked up the young, they appeared very neat and tidy.



I had not found the nest any too soon, for a few days later (June 30), a venturesome youngster who had tried to see too much fell out. As I was about to pick him up, he turned on his back and defended himself by drawing up his feet and pinching anything that came near with his talons. I replaced him in his nest, but the time of departure was very near.

On July 5, all of the birds left the nest, - two males and two females. Some went to the peak of the roof, others to a nearby tree, all clamoring for their mother. Meanwhile the mother hovered in the air, shouting her killy-killy-killy, and watching anxiously that nothing happened to her children. The other parent I had not seen since I found the nest; either he deserted his mate or was killed.

It was marvelous how the fairly large mother bird could remain in the air motionless by only beating her wings like a hummingbird or a dragon-fly. She was always crying out her encouragement to the young who answered from a fence post or an apple tree in a very baby-like wailing.

A few days later when they were gone, I could not help but wish that everybody could become associated with this friendly and beneficial hawk.

\* *Falco sparverius sparverius* Linné

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### NOTES

#### Meetings of the Society

On June 12, the Society's lecture season closed with a most interesting lecture by Dr. Andrew Colin Gillis, entitled "Superstition and Pseudo-Science."

June 5 - Mr. William Hassler, an honorary member of our Society, and a member of the American Museum Staff in New York, visited our quarters. In the evening he gave an interesting talk on the courtship and mating habits of several species of lizards he has been studying.

June 19 - Mr. Hassler was again the guest of the evening. On this occasion he showed some of his moving pictures of various phases of his reptile work in New Jersey, Florida, Haiti, and the Dominican Republic.

June 23 - Mr. A. Llewellyn Jones, curator of the Department of Mineralogy, spoke on "The Benefits I Have Derived from the Study of Mineralogy."

June 2 - Junior Meeting. Father John A. Frisch, S.J., gave the boys and young men an illustrated lecture - "Life History of the Hunting Wasp."



June 16 - Junior Meeting - Round table discussion concerning recent scientific research.

#### Departmental Meetings

June 4 - Paleontology  
 June 6 - Entomology  
 June 8, 22 - Botany

#### Lectures to Outside Organizations

June 1 - Eastern High School. Four lectures by Mr. Harry C. Robertson - "Snakes of Maryland." Illustrated.

John Carroll of Carrollton High School - Lecture by Mr. Richard Webster - "Characteristics of Insects."

#### Exhibitions

June 6 - Exhibition of snakes at the Pre-Vocational School.

#### Expeditions

Two expeditions of note were conducted during the month. Both left Baltimore on June 15 and returned on June 25.

One, headed by Mr. Gilbert C. Klingel, curator of the Department of Marine Research, was made to Juniper, Florida, to try out underwater equipment, and to study and make special observations of the marine life of this locality. Mr. Klingel was accompanied by Mr. Harry Zachary, assistant in this Department.

The other was conducted by Messrs. W. Bryant Tyrell and Edward McColgan of the Department of Ornithology. This expedition, made in conjunction with the Biological Survey, was to Smith's Point and Reedsville. The object was to study the osprey colony of this region. Fifty-nine ospreys were banded as well as three great blue herons.

#### Mineral Check List

On Tuesday, June 26, the Department of Mineralogy presented the Department of Geology of the Johns Hopkins University with a list of mineral localities of Baltimore City and County, containing a check list of the minerals found there to date by the Natural History Society of Maryland.

#### Interesting Mineral Publication

The Oregon Mineralogist, official publication of the Oregon Agate and Mineral Society, Portland, Oregon, now in its sixth issue of Volume II, contains much interesting matter. Most of the articles are not local, but consist of subject matter adapted to mineralogists everywhere.



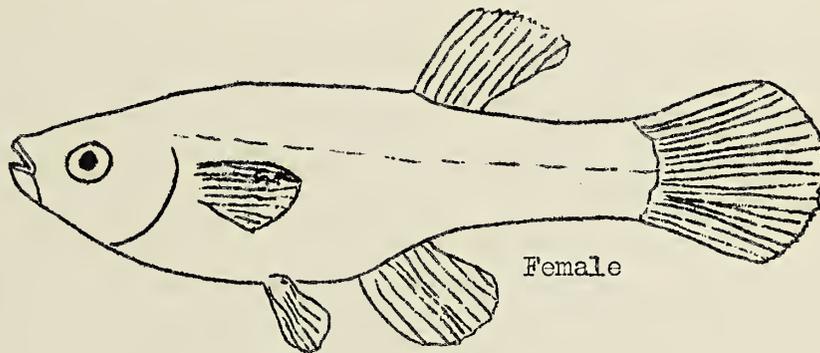
## NOTES ON GAMBUSIA HOLBROOKI-"THE TOP MINNOW"

By Frank C. Yingling

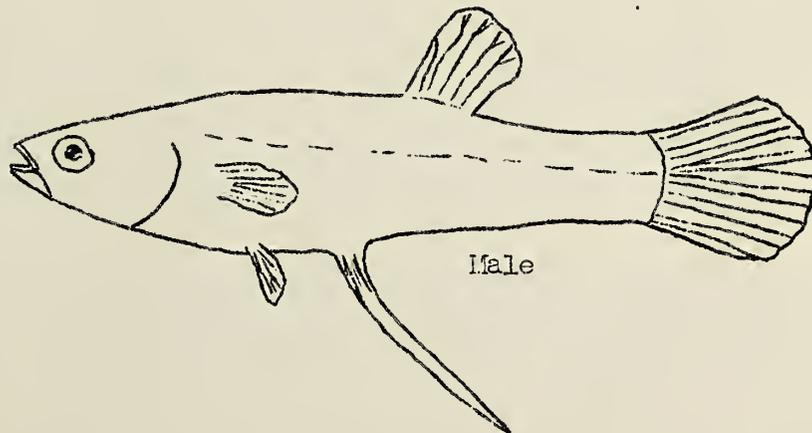
This little fish, unusual in that it is the only member of the family Poeciliidae found in Maryland waters, receives its generic name "Gambusia" from the Spanish, in which it means "of no account." This is an incorrect appellation, however, since Gambusia is especially valuable for the destruction of mosquitoes in the larval stage. In many parts of the world it has been introduced for this purpose.

Seven specimens, three of them females, were collected in a small stream two miles north of Cove Point, Maryland. The males were from 17 mm. to 19 mm. in length, and the females from 25 mm. to 29 mm. Two of the females were gravid. The young, which were later brought forth alive (for *Gambusia holbrooki* is viviparous), measured when born about 8 mm. in length.

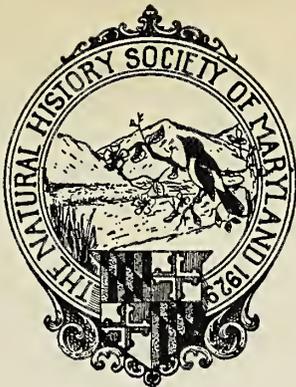
The male is smaller than the female, rarely reaching a length of  $1\frac{1}{2}$  inches, and can be readily distinguished from the female by the anal fin which is used as an intromittent organ. In the case of the male this fin is prong-shaped; in the female, fan-shaped.



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## BULLETIN

Volume IV

JULY, 1934  
Herbert C. Moore, Editor

Number 11

### RELATION BETWEEN LOCOMOTION AND FREQUENCY OF CONTRACTION OF THE CONTRACTILE VACUOLES IN PARAMECIUM.

Preliminary Report.

By John A. Frisch, S. J.

A drop or two of culture fluid containing about twenty to thirty individuals of *Paramecium caudatum* and *multimicronucleatum* together with a few individuals of *Vorticella* and *Paranema*, some Rotifers and unicellular green algae from a mixed hay-infusion, culture were placed in a vaseline enclosure on a glass slide and sealed in with a cover glass. In some of the slides a small amount of air was trapped in the enclosure. These slides were first kept in the diffused light of the laboratory though later some of them were kept in the dark. In these preparations some of the paramecia survived for over a month, and died apparently of starvation, as judged by their emaciated appearance. Those kept in the dark seemed to survive as well as did those kept in the light. The algae were probably not responsible for the survival. To check the physical condition of the paramecia daily observations were made on the frequency of the pulsations of the contractile vacuoles. These observations showed a gradual decrease in the frequency of the pulsations, and a great variation in the frequency of successive pulsations in the same individual. Thus single individuals observed during 50 to 100 consecutive pulsations of the contractile vacuoles showed frequencies varying between 15 seconds and 6 minutes and 5 seconds. (cf. Chart).

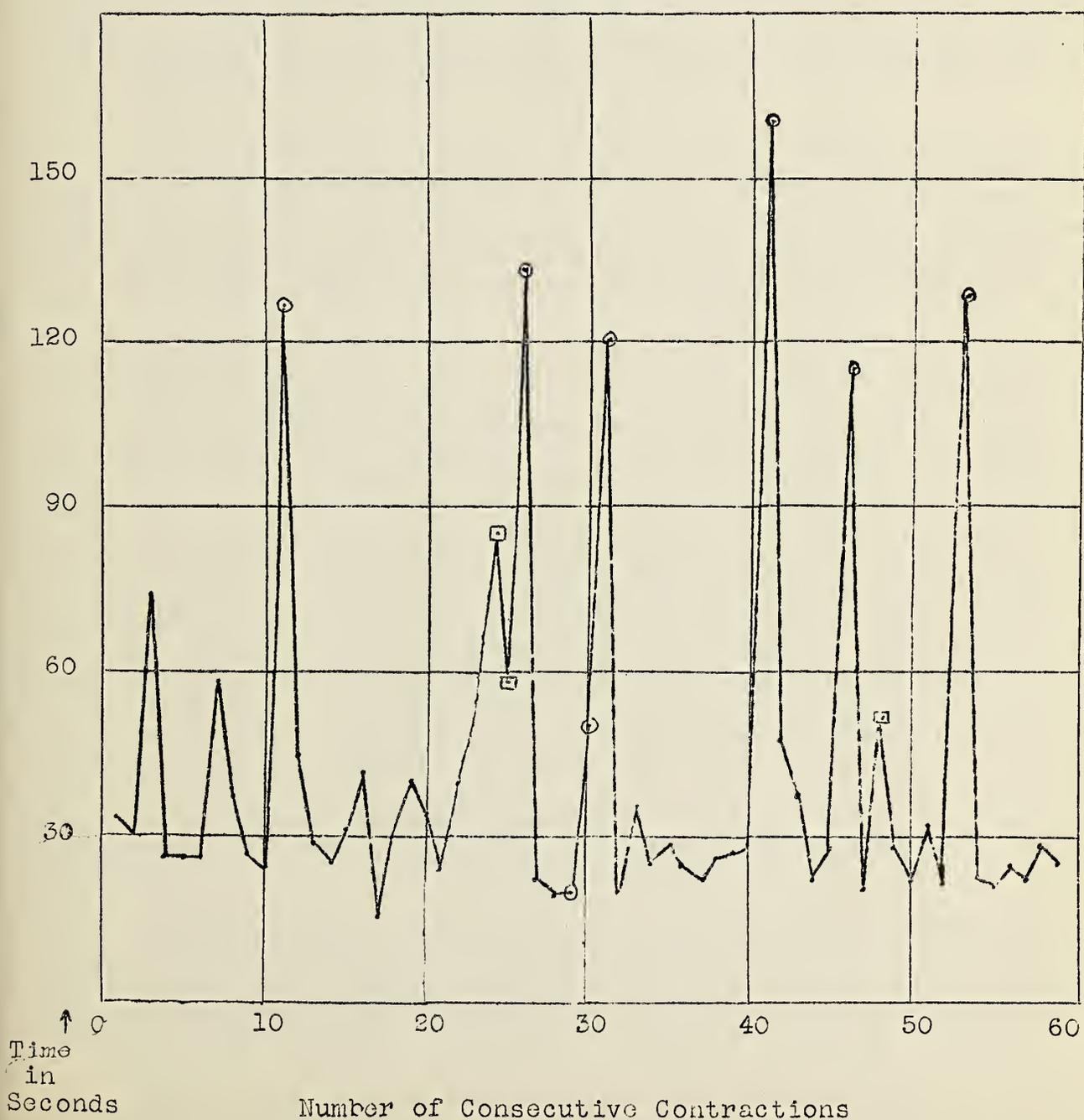
A quite marked correlation was observed between the frequency of the pulsations and swimming. All the long cycles occurred while the animals were actively swimming; the short cycles while they were at rest. Spasmodic swimming during which the animals alternately rest and swim every few seconds, showed an intermediate frequency. A probable explanation of this correlation lies in the fact that paramecia do not feed while actively swimming, and hence ingest less



water. The frequency of the pulsations of the contractile vacuole appears therefore to be directly correlated with the locomotion of the animal and more particularly with the feeding. If this is true it strongly supports the contention that the primary function of the contractile vacuole is hydrostatic, namely, to control the water content of the protoplasm.

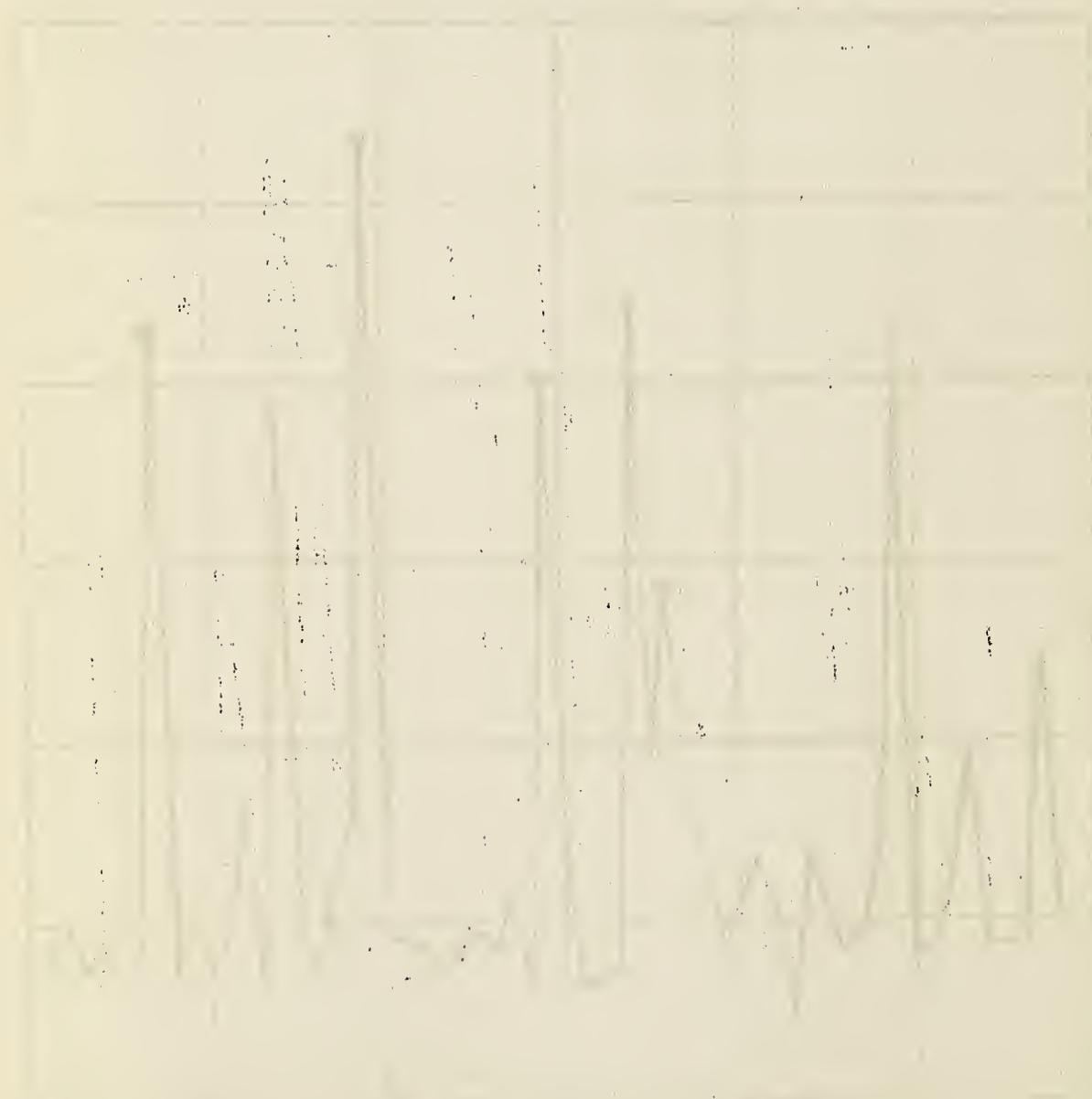
Moreover, if the amount of water ingested during feeding is such a controlling factor in the frequency of the pulsations, it suggests, that the results of certain experiments, such as the effect of salts, of osmotic pressure, of hydrogen ion concentration, and others, might be due not directly to these factors, but indirectly to their influence on the rate of feeding.

A complete report on these experiments will be published later.



○ indicates active swimming; □ spasmodic swimming; • at rest

The following table shows the results of the experiments conducted on the effect of temperature on the rate of reaction between hydrogen peroxide and potassium iodide. The reaction is catalyzed by the presence of a small amount of potassium iodide. The rate of reaction was measured by the volume of oxygen gas evolved in a given time.



The graph shows that the rate of reaction increases with temperature. This is because the molecules have more kinetic energy and are therefore more likely to collide with sufficient energy to overcome the activation energy barrier.

## NOTES ON THE INCUBATION OF THE INDIGO BUNTING \*

By Henri Saibert

On July 30, in a grove of locust trees near Sykesville I found a nest of the Indigo Bunting. As this was a rather late date I decided to pay special attention to it. The nest was situated three feet from the ground on a branching limb of a small locust tree. It was composed of dead leaves, strips of bark, grass stems, and bits of newspaper. The interior, which was lined with finer grasses, had an inside diameter of one and a half inches and an outside or overall width of three and a half inches. In the nest were three bluish white eggs which the bird was incubating when I interrupted her.

During the building of the blind the female was very nervous and demonstrated her anxiety by continually hopping from limb to limb of nearby trees and uttering a sharp "tsick". The male bird would then come and join her in vociferating disapproval, but his activities were limited to an occasional flutter in the tree foliage where he was careful to make himself inconspicuous.

On the fourth of August I entered the blind for the first time at 9:37 in the morning and watched for two and a half hours. I crawled into the blind from the rear and as the entrance was on the same level as the nest, the bird could not see me and consequently was not frightened off her nest. During the first seventeen minutes she turned her eggs three times. This operation consisted of the bird's raising her tail out of the nest and pushing herself backwards to an angle of 45 degrees, in which position she was capable of manipulating the eggs. The performance was short, never lasting more than five seconds. After the egg had been turned, she wriggled herself into a comfortable position and remained that way until the next egg was turned. At first she was extremely nervous and peered continually over the edge of the nest at the slightest disturbances. Her restlessness finally got the better of her and she left the nest, but she returned within four minutes with her fears allayed. From 10:04 to 10:34 she turned the eggs three times. In the interim she closed her eyes, but they always opened at the slightest sound. At 10:34 she left the nest and did not return until nine minutes later. In this interval she undoubtedly ate, for on her return she smacked her mandibles in a chop licking fashion. It was forty-nine minutes until she again left her nest and during that time she turned the eggs ten times. All was quiet and her incubation was undisturbed except for the prowlings of a House Wren that attracted her attention.

At 11:37 she left her nest to eat and was gone for fourteen minutes. At 12:02 she turned the eggs. I had to leave the blind at this time.

When I returned on the afternoon of the sixth, everything was as usual. In the hour and a half that I watched, she turned the eggs only twice, while during the two and a half hours' observation of the previous day she turned them sixteen times. Probably the heat of the afternoon cut down the necessity for their frequent turning.

In all that time I saw the male bird only twice. I came around at night to make sure the male had no hand in the incubation, and as

THE HISTORY OF THE UNITED STATES

CHAPTER I

The first part of the history of the United States is the story of the early years of the Republic. It begins with the signing of the Declaration of Independence in 1776 and ends with the adoption of the Constitution in 1787. This period is often called the "Founding Era" and is characterized by the struggle for independence from Great Britain and the establishment of a new form of government.

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I expected, the female was on the nest.

The bird continued incubation until August 14, on which day I found the nest empty.

\* *Passerina cyanea* (L.)

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## UNCOMMON FISH IN THE CHESAPEAKE BAY

By W. Bryant Tyrrell

On September 30, 1933, at Honga, Hoopers Island, Maryland, Captain Sam Tolly caught in his pound nets, near Cedar Point, a Cutlass Fish (*Trichiurus lepturus*). This fish, of unusual occurrence so far north in Chesapeake Bay, was twenty-seven inches long, two inches wide, and not more than half an inch thick. Its color was a light pearly blue, somewhat darker on top and shading to a pearly white below. Two interesting features about this fish were that the dorsal fin extended nearly the entire length of the back and the mouth was full of needle sharp teeth.

On the same day a large Garfish (*Lepiosteus osseus*) was killed by a blow of an oar in the shoal water near Solomons Island by one of the residents of Honga. This fish was forty-four inches long and thirteen and one-half inches wide. The color was a dark greenish blue, shading to a pearly white below, with each white scale edged with a delicate pink.

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### NOTES

#### Meetings of the Society

July 17 - Talk by Mr. Edward McColgan - "Ruins of Paestum and Girgenti."

July 24 - Talk by Mr. Harry H. Zachary concerning the construction of the float which will be used in connection with the diving tank of the Department of Marine Research.

#### Departmental Meetings

Botany - July 27

Mineralogy - July 28

Paleontology - July 2, 9, 16, 23, 30

#### Junior Meetings

July 7 - Talk by Mr. Martin Fedder - "Minerals and Their Identification."

July 21 - Round table discussion.

#### Lectures to Outside Organizations

July 23 - Lecture by Mr. John B. Calder, Assistant Curator, Department of Paleontology, to the Boy Scouts of America at Camp Linstead - "The Geology of the Region around Camp Linstead."

#### Exhibition

July 9 - 30 Exhibit at Enoch Pratt Library, Central Branch, featuring minerals of Maryland with apparatus showing the fluorescence of some minerals.

#### Educational Field Trips

July 23 (1), July 24 (2), July 25 (2). Conducted by Mr. John B. Calder to Sullivans Cove with various parties of Boy Scouts from Camp Linstead.



Trustees Meeting

July 12 - Quarterly meeting of Board of Trustees. The following committees were appointed by the president: Executive - Mr. Gilbert C. Klingel, chairman, Mr. Edward McColgan, and Mr. Elra M. Palmer; Finance - Mr. Edward McColgan, chairman, Mr. Gilbert C. Klingel, and Mr. Herbert C. Moore; Membership - Mr. Elra M. Palmer, chairman, Mr. John B. Calder, and Mr. A. Llewellyn Jones.

The curators appointed by the president for this fiscal year were accepted by the Board.

The Staff including the Staff officers appointed by the respective curators follows:

THE STAFF

Chief of Staff, Edmund B. Fladung, President  
Secretary, Elra M. Palmer

DEPARTMENT OF MINERALOGY

Curator- A. Llewellyn Jones  
Walter E. Price, Jr., Assistant Curator; Elra M. Palmer, Assistant Curator

Associate Curators  
John B. Calder, B.S., Benjamin Calder, Herbert C. Moore, B.S., L.O. Robertson, B.S.  
Charles Ostrander

Junior Associates  
L. Bryant Mathers, Jr., Edward Crosby, Jr.  
Martin Fedder

DEPARTMENT OF PALEONTOLOGY

Curator - Elra M. Palmer  
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Benjamin Calder, Staff Assistant  
Oscar L. Helm, A.B., Associate in Fossil Mammals  
Associates in Fossil Invertebrates  
William E. Lehr, B.S., Roger S. Hecklinger, Robert Wheeler

DEPARTMENT OF BOTANY

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Secretary, Clyde Reed  
Associate Curators  
Elra M. Palmer, Francis O'Rourke, B.S., Mitchell Hilpert

DEPARTMENT OF ENTOMOLOGY

Curator - F. Stansbury Haydon, LL.B.  
Francis O'Rourke, B.S., Assistant Curator  
Edward Gretskey, Assistant Curator; Elmo Masters, Assistant Curator; Richard Webster, Staff Assistant; L. Bryant Mathers, Jr., Staff Assistant



DEPARTMENT OF MARINE RESEARCH

Curator-Gilbert C. Klingel

Harry H. Zachary, Assistant Curator; Frank Yingling, Assistant Curator

Joseph White, Associate Curator

DEPARTMENT OF HERPETOLOGYCurator - Harry C. Robertson  
Richard M. VonHagel, Assistant CuratorAssociate Curators  
Gilbert C. Klingel, George MaugansDEPARTMENT OF ORNITHOLOGY

Curator - Edmund B. Fladung, B.S.

Irving E. Hampe, Assistant Curator in charge of Collections  
W. Bryant Tyrrell, Assistant Curator in charge of Taxidermy  
Edward McColgan, Assistant Curator in charge of Bird BandingAssociate Curators  
Bruce R. Overington, Henri Seibert, Harold L. EatonDEPARTMENT OF ARCHAEOLOGYCurator-Richard E. Stearns  
Milton Oler, Assistant Curator; Woodward Burkhart, Assistant CuratorLIBRARYLibrarian - John B. Calder, B.S.  
Earl M. Palmer, Assistant Librarian; Eugene R. Polacek, Assistant LibrarianJunior Assistant Librarians  
Edmund B. Fladung, Jr. , Woodward BurkhartDEPARTMENT OF PUBLICATIONEditor - Herbert C. Moore, B.S., LL.B.  
Edmund B. Fladung, Jr., Assistant Editor

Associate Editors - all department heads

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Walter E. Price, Jr., Assistant Curator  
Earl M. Palmer, Secretary  
Charles H. Waller, Staff Artist  
L. Bryant Mathers, Jr., Chairman, Junior Division

Associates - all department heads

THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

RESEARCH REPORT NO. 100

BY J. H. GOLDSTEIN

AND R. F. SCHNEIDER

1950

CHICAGO, ILLINOIS

UNIVERSITY OF CHICAGO PRESS

1950

CHICAGO, ILLINOIS

This report was prepared under the auspices of the National Science Foundation, Office of Naval Research, and the Army Research Office-Durham.

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## BULLETIN

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Volume IV

AUGUST, 1934  
Herbert C. Moore, Editor

Number 12

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### LIFE OF THE COMMON EEL

(With notes relating to the appearance of the elevers in the Patapsco River)

By Frank C. Yingling

One of the most interesting and mysterious life histories is that of the common eel, *Anquilla rostrata*, the only species found in our waters. In spite of its snakish appearance, it belongs to the class Pisces or true fishes. Although of marine origin, it spends most of its life in fresh water. Then upon sexual maturity it migrates far out to sea again to spawn. The spawning place according to authorities occurs southwest of Bermuda.

Specimens with ripe eggs have never been taken because maturity is not fully attained until the spawning grounds are reached. The eggs are very small and extremely numerous; the young upon hatching are flat ribbon-shaped creatures and are totally transparent, being entirely devoid of pigment except in the eyes. They have a well developed mouth with very large teeth. This is known as the "Leptocephalus" stage. In the migration from mid-ocean to the shore a metamorphosis takes place. The larvae lose their length and depth but gain in thickness. Also the larval teeth are lost and are replaced by permanent ones, and the body pigment is still largely wanting. By the time they have reached our shores they are known as "glass eels" or elevers.

Observations have been made for the past three years on the elevers as they reach the upper Patapsco in the vicinity of Glenartney. The elevers reach this section around the last of April and the early part of May, the migration lasting from two to three weeks. It is quite a fascinating sight to see thousands of these small fish fighting their way against the swift current of the river. Sometimes they are washed back several feet, but they never give up until their destination is reached.

At night the elevers are found in no great activity close to

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures that the financial statements are reliable and can be audited without any discrepancies.

Furthermore, it is noted that the accounting system should be designed to be user-friendly and efficient. This allows the staff to enter data quickly and accurately, reducing the risk of errors. Regular training sessions should be provided to the staff to ensure they are up-to-date with the latest software and procedures.

In addition, the document highlights the need for a strong internal control system. This includes the separation of duties, where different individuals are responsible for different aspects of the accounting process. This helps to prevent fraud and ensures that no single person has too much control over the financial data.

Another key point is the importance of regular reconciliations. This involves comparing the company's records with bank statements and other external sources to identify any differences. If a discrepancy is found, it should be investigated immediately to determine the cause and correct the records.

The document also discusses the role of the accounting department in providing valuable information to management. By analyzing the financial data, the accountants can identify trends, spot potential problems, and suggest ways to improve the company's performance. This makes the accounting department an essential part of the management team.

Finally, it is stressed that the accounting records should be kept secure and backed up regularly. This is to protect the company's financial information from loss due to hardware failure, theft, or other disasters. Having a disaster recovery plan in place is crucial for ensuring the continuity of the business.

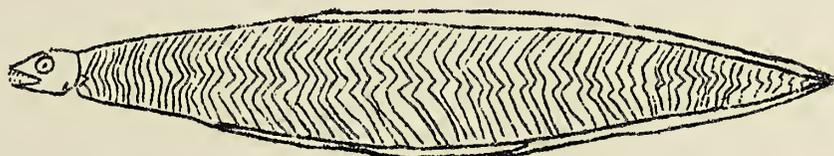
In conclusion, the document provides a comprehensive overview of the key principles and practices of effective accounting. It covers everything from record-keeping and internal controls to the role of the accounting department and data security. By following these guidelines, a company can ensure that its financial records are accurate, reliable, and secure, which is essential for long-term success.

shore and among rocks and logs, but upon the presence of a light for a few moments they become quite active and begin squirming in and among the rocks and logs where the darkness is greatest. Apparently it is daytime when the fish work their way up stream, climbing dams until a suitable feeding ground is reached.

The eelvers of the two previous years' migration were between 47 mm. and 60 mm. in length and about .03 of an ounce in weight, with the body pigment fairly well developed. The specimens observed this year were about the same except the pigment was largely wanting.

Two months later some of these eelvers were taken in a small stream near the Patapsco River, one-eighth of a mile from the spot where the specimens above were observed. They were found close to the banks among the rocks and other debris. They were from 53 mm. to 65 mm. in length, and most of these eels had the body pigment well developed and the body becoming more cylindrical in shape.

The growth of these fish seems to be very slow, as specimens of previous years' migrations had only reached a length of 96 mm., 100 mm., 116 mm. It is supposed that maturity is reached between  $7\frac{1}{2}$  and 9 years; then these eels start on their migration to the sea, all traces being lost when they leave the bay until the larval stage is taken. After spawning it is supposed the adult dies, thus completing the life cycle of *Anquilla rostrata*.



Leptocephalus stage

(Enlarged)



Glass-eel or eelver

(Enlarged)



## THE COMMON SWIFT

By Harry C. Robertson

The Common Swift (*Sceloporus undulatus*) is the most abundant of the few species of lizard found in Maryland. It is easily identified by its rough keeled scales which end in sharp points. Its ground color varies from a gray to a reddish-brown, and its back is marked with a series of darker V shaped bands. Occasionally, males lack these V shaped markings, in which case they are usually the reddish-brown variety.

Males may be distinguished from females by the dark blue or bluish-green markings on both sides of their abdomens and on the underside of the lower jaws. Females sometimes show similar blotches on the jaws but they never have the abdominal marks. (See illustration).

This species is found in all parts of the state, especially in those sections which are sandy. It lives in old decaying trees where there is an abundance of insects for food.

As early as March the Common Swifts come out of hibernation and may be seen catching their insect prey. On cloudy days they move about sluggishly, but if one attempts to pick them up there is a lightning-like movement as the lizard races away.

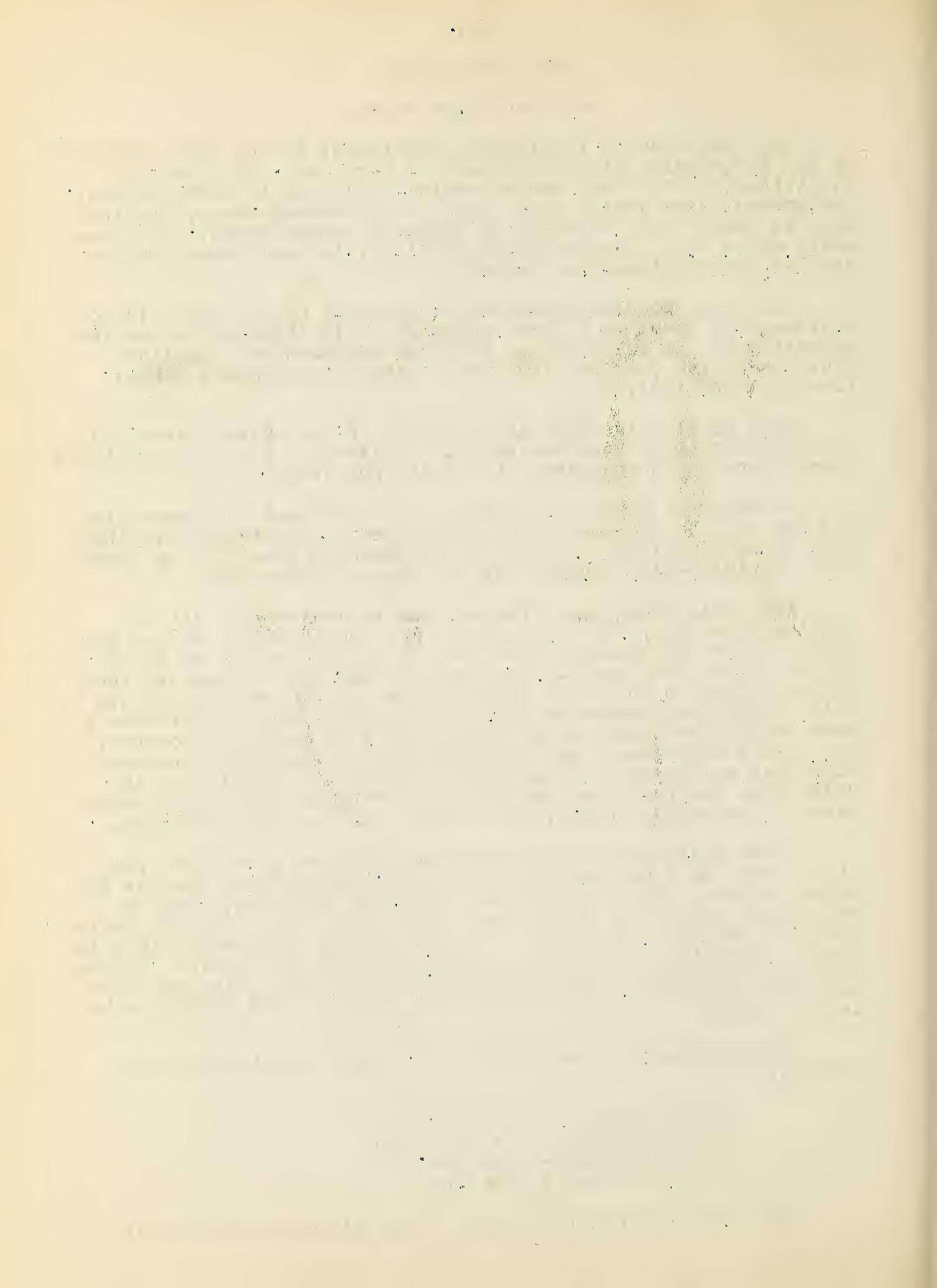
When collecting this species, one is confronted with an amusing situation, for the lizard darts from one side of the tree to the other and usually works its way up high enough to be out of the collector's reach. Care must be taken in collecting too, if the lizard is to be had intact, since slight pressure on its tail leaves that member of its body wriggling in the collector's hand or fingers while the reptile escapes to shelter. However, the lizard will grow a new tail and many specimens are observed with this replacement of cartilage which is always lighter in color than the remaining section. The original tail is an extension of the spinal column, but the new tail is only cartilage.

These Swifts never roam far from their own group but spend their lives in a particular location year after year. May is the mating season, and as is the case with most reptiles, they are oviparous, depositing in the earth from five to twelve eggs during July and August. These eggs are three-eighths to one-half inch in length according to the size and condition of the female. If the eggs are carefully collected, placed in damp wood pulp, and kept in a temperature of about thirty-five degrees, they usually hatch in six weeks.

The approximate measurements of an adult specimen are as follows:-

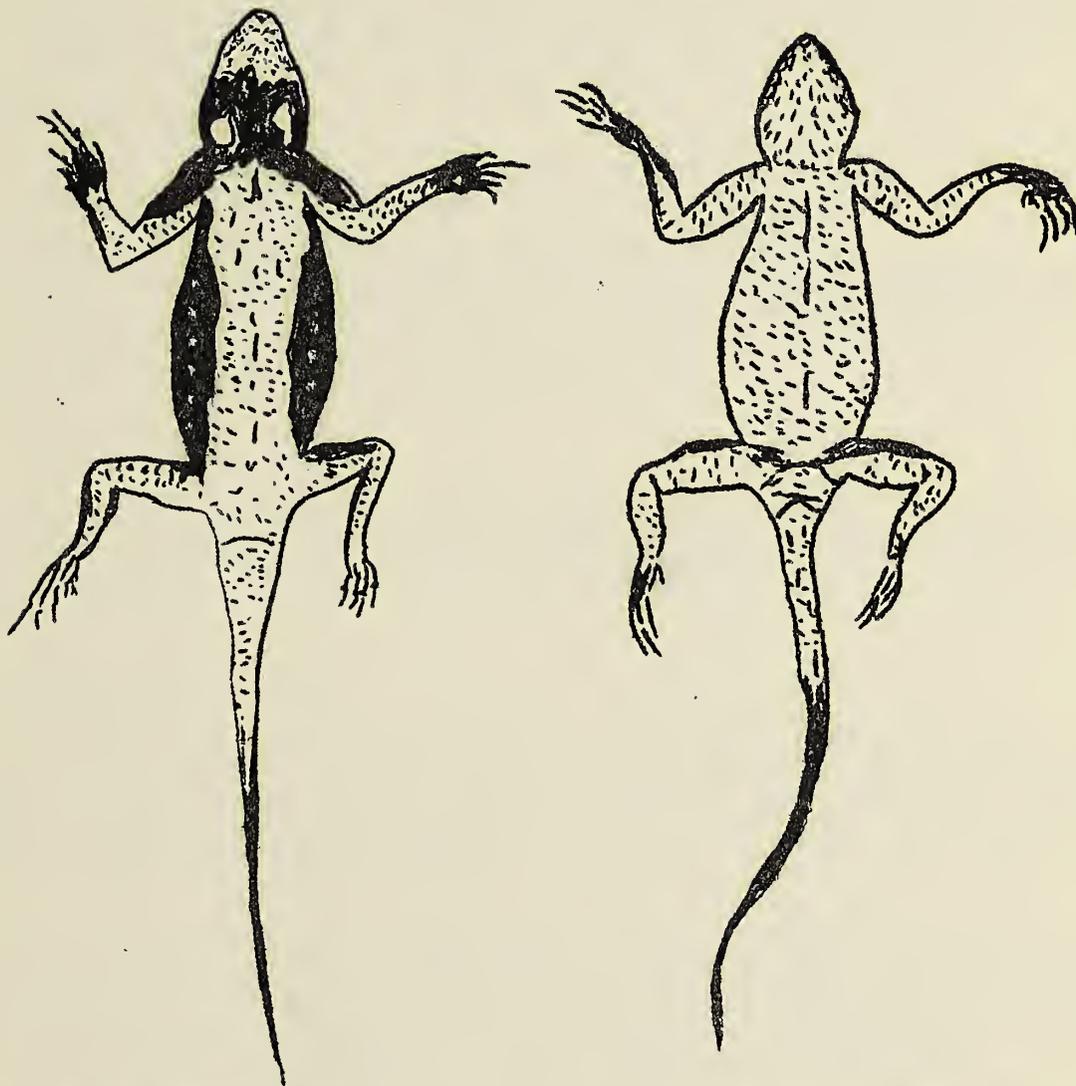
Total length - 5-1/2 inches  
 Length of tail - 2-7/8 inches  
 Width of body - 3/4 inch  
 Width of head - 9/16 inch

The Common Swifts will thrive a long time in captivity if



supplied with a dry cage, with meal worms or other soft-bodied insects for food.

Inasmuch as they eat many noxious insects, including grubs of the wood boring types, they are beneficial to man and should be therefore protected.



Male (under side)

Female (under side)

Common Swift  
(*Sceloporus undulatus*)

-\*-

#### NOTES

##### Meetings of the Society

August 7 - Talk by Mr. Elra M. Palmer - "The Planetarium of the Franklin Institute in Philadelphia."

August 14 - Talk by Mr. Gilbert C. Klingel - "Nocturnalism."



- August 21 - Talk by Mr. Irving E. Hampe - "Animal Ecology."  
 August 28 - Talk by Mr. Francis O'Rourke - "Plant Ecology."

### Departmental Meetings

Botany - August 8.

(All other departmental meetings were discontinued during the month of August but will be resumed in September).

### Junior Meetings

August 4 - Talk by Mr. Elra M. Palmer to the Junior group - "The Planetarium of the Franklin Institute in Philadelphia."

### Exhibitions

July 30 - August 12. Exhibit of marine shells at the Enoch Pratt Library, Central Branch.

August 1 - September 15. Exhibit of minerals by J. D. Doxen of the Junior Division at the Enoch Pratt Library, Branch No. 15.

August 6 - 27. Exhibit of enlarged photographs of Bald Eagles by Mr. W. Bryant Tyrrell of the Department of Ornithology at the Enoch Pratt Library, Central Branch.

### Field Trips

On August 19, Messrs. Frank Yingling and Joseph White of the Department of Marine Research returned from a week's trip to Cove Point, Maryland, where they studied and collected various forms of marine life.

### Notes from Canada

Mr. Wallace Coleman, associate curator of Ornithology, and one of the founders of our Society, who has been residing in Saskatoon, Canada, the last few years, recently wrote Mr. Fladung a long letter in which he described in some detail one of his field trips to the Canadian Zone in Saskatchewan.

Mr. Coleman has already done a great deal of work with the birds and flora of the Transitional Zone which crosses southern Saskatchewan, and we are glad to hear that he is expanding his scientific studies so as to include a portion of the Canadian Zone too. Mr. Coleman's first impression of this latter zone follows:

Our first glimpse of the Canadian Zone occurred about twenty miles south of Prince Albert. We had reached a higher level of ground and a belt of spruce crowned the ridge. The change from the monotony of the prairie vista was glorious. The small town of Prince Albert offered very little of interest except historically, for it figured much more prominently in the early days of settlement than did Saskatoon. Dr. Rawson had driven down to meet us and we were on our way for the next hundred miles. There was a definite change in both the topography and the vegetation. The flat plain was replaced by rolling hills, the meager clumps of cotton wood and willow now gave way to beautiful stands of spruce, tamarack and birch. The weather became more and more threatening, the clouds seemed to roll over the very tops of the trees. I have seen it much brighter at nine in the evening under different conditions.





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The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author outlines the various methods used to collect and analyze the data. This includes both primary and secondary data collection techniques. The primary data was gathered through direct observation and interviews, while secondary data was obtained from existing reports and databases.

The third section details the statistical analysis performed on the collected data. This involves the use of descriptive statistics to summarize the data and inferential statistics to test hypotheses. The results of these analyses are presented in a clear and concise manner, highlighting the key findings of the study.

Finally, the document concludes with a summary of the findings and their implications. It discusses the limitations of the study and suggests areas for future research. The author expresses confidence in the reliability of the data and the validity of the conclusions drawn.

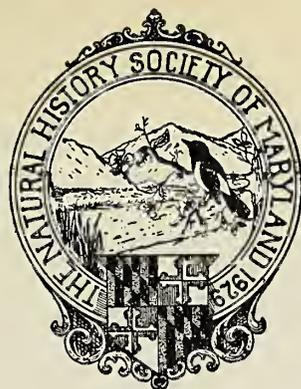
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*The Natural History*



*Society of Maryland*



## BULLETIN

Volume V

SEPTEMBER, 1934  
Herbert C. Moore, Editor

Number 1

### CHROME ORE IN MARYLAND

By Elra M. Palmer

The discovery of the element chromium is credited to the French chemist, Louis Niccolas Vauquelin. In Vauquelin's first paper on this element, published in 1797, he speaks of the discovery of a new metal found in a mineral called crocote, a lead chromate which had been sent to him for analysis. (1) The second memoir of Vauquelin describes in detail the properties of the element which he calls chromium, a descriptive name based on the Greek word chroma (xpwus) meaning color. (2)

As a result of Vauquelin's research, in 1798 deposits of chrome iron or chromite were discovered in the Ural Mountains. The element was extracted from the ore, converted into chromic salts and used as coloring matter, which was found to be especially well adapted for use in porcelain and pottery ware. The ore, however, was very expensive, principally because of transportation expense. Again, extraction process was very crude; hence chromic salts sold at high prices.

About 1810 or 1811 chromite was discovered in America at Bare Hills, near Baltimore, Maryland, by a man named Henfrey. (3) Chrome at this time was a little known metal and the Bare Hills deposits were probably not worked to any extent until 1827 when Isaac Tyson, Jr., began his operations in the Hills. In view of the fact that he was engaged in the manufacture of epsom salts, Mr. Tyson was quite interested and well read in the chemical research of the day. Being familiar with Vauquelin's work, Tyson was able to identify the chromite which he found in scattered pockets and lenses across the Bare Hills area. Realizing the value of this ore, Tyson immediately began mining it. The exact date at which the mining commenced is uncertain. However, the sketch map which H. H. Hayden made in 1833 locates many of the openings now existing. (4) The operations are referred to in the past tense and as having been abandoned for sometime. Therefore, the mining probably began about 1812 or 1813. At present date seventeen openings may be found on



this locality (5), some of which are not found on Hayden's map, so that we can conclude that work was resumed after 1833.

An interesting account of the discoveries of chrome ore in Maryland was written in 1895 by William Glenn. (6) Apparently, Glenn had overlooked H. H. Hayden's 1811 letter in which the discovery of chrome is attributed to a Mr. Henfrey. According to Glenn, in 1827, Tyson saw in Belair market, Baltimore, a cart containing a cider barrel held from rolling by some heavy black stones which he recognized to be chromite. The source of the stones was traced to what became the site of the Reed mine near Jarrettsville in Harford County. The property was owned by the Reed family and operated under lease by the Tyson Mining Company. This mine was one of the largest operated in Maryland.

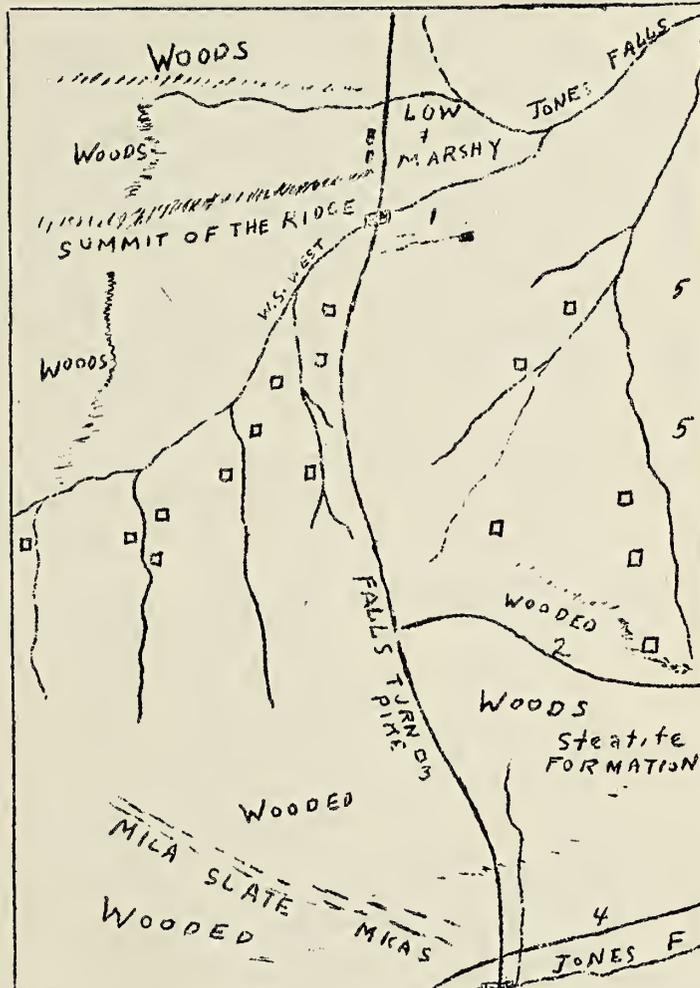
After this discovery and the opening of the Reed mine, Tyson immediately began prospecting. His keenness in recognizing chromite as always being associated with serpentine aided him in ferreting out nearly all known chrome deposits that extended across the State of Maryland as well as those across the state line into Pennsylvania.

The Tyson Company by purchase or lease obtained mining control in all the areas where chromite was found. These were Cecil and Harford Counties, Maryland, Lancaster County, Pennsylvania, and also Baltimore and Montgomery Counties, Maryland. In Cecil County, Maryland, the most extensive mines were the Line pits just northwest of Rock Springs. Knopf (7) describes the workings of this mine as consisting of a vertical shaft sunk to about 95 feet, from which a draft was run southwest 75 feet. About five miles northwest of Rising Sun, Maryland, in Lancaster County, Pennsylvania, was located the Wood mine, the largest and richest chromite deposit in the United States. The ore, assaying about 56.6% chromic oxide (7), was found here in a vein about 300 feet long and averaging about 20 feet wide. The average ore assays about 40% chromic oxide. This mine was also under the control of the Tyson Company. The Company's chief holdings in Harford County were the Reed and Wilkins mines, both situated near Coopstown just northeast of Jarrettsville. The Reed mine tapped a vein of ore about 80 feet long. The Wilkins mine was hardly more than a pocket deposit. Baltimore County contained two areas that have been very productive. At Bare Hills the ore was found in lenses or in disseminated grains throughout the matrix of blue-green serpentine. The mining activities at this locality were numerous but not very extensive. The Soldiers Delight region has probably been the most productive area in the State of Maryland. This region is located about ten miles northwest of Bare Hills. Four important mines are located here; the Choate, the Weir, the Harris, and Calhoun. A concentrating mill treated ores from the Weir and Harris mines. The serpentine outcrops of Montgomery County contain little chromite, and hence are of no commercial value. Thus, although a shaft was sunk at Etchinson, it was early abandoned. In all the serpentine areas throughout the state, the streams and runs draining the areas have been worked to obtain sand chrome, which is merely the grains of chromite freed from their matrix of serpentine by weathering. The sand is screened and then washed in a long narrow trough, known as a buddle, through which water is run. (8) The lighter grains of sand are carried off, leaving the heavier grains of chromite.



HAYDEN'S MAP OF THE  
BARE HILLS

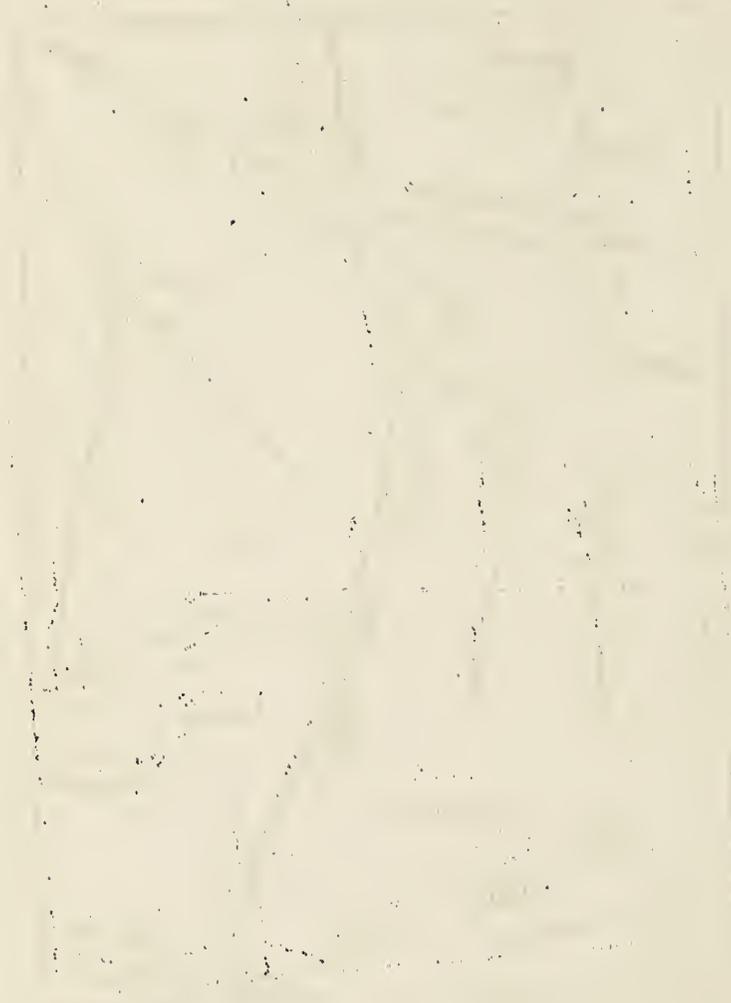
1833



1. Footpath
2. Road leading to the Gunpowder works on Jones' Falls
3. Small house in the woods by the side of the road.
4. Baltimore and Susquehanna Rwy.
5. Eastern slope of Bare Hills

The squares represent chrome holes.

(From Description of Bare Hills, H.M. Hayden, *American Journal of Science*, Vol. 24, pp. 349 - 360. On the original map the chrome holes are designated by letters in squares. It is in this way that the author refers to them specifically in the text. There are also a few other special references to places discussed in the article.)



By 1833 Tyson held a monopoly on the chrome mining in the United States, the ores being sent to London and Paris where they were treated and made into pigments. During the year 1828 Tyson established a factory on what is now Columbia Avenue, Baltimore, for the manufacture of chrome yellow. At first he was unsuccessful. In 1833 he attempted to establish a successful plant but again failed. In 1845, however, the great Tyson Chrome Works - The Baltimore Chrome Works - were established in Baltimore and monopolized the manufacture of chromium compounds in this country for over forty-five years, long after the Maryland mines received an economic jolt when the great deposits of chromite were discovered at Brusa, near Constantinople, Turkey in 1848. In 1870, when the chrome deposits in Maryland were nearing exhaustion, the Tyson Company sent prospectors to California and leased all the workable deposits. The ore was sent by sailing vessels, by way of Cape Horn, to the Tyson plant at Baltimore. From 1827 to 1860 the Tyson Company of Maryland controlled the world's production of chromite and the manufacture of pigments. (9) In 1861 still larger and richer deposits of chromite were discovered in Turkey, and from that date to 1897 the Turks produced most of the chrome ore. Singewald says, "The Tysons, however, maintained the prestige of their Baltimore Chrome Works until they sold out to the Mutual Chemical Company of America in 1908 and finally withdrew from the chrome business." (10)

By 1885 very little chrome mining was done in Maryland, most of the ore being mined abroad. Brewer (9) gives the following in regard to the output of chromite:-

1827 to 1861	Maryland and Pennsylvania, U.S.
1861 to 1897	Turkey
1897 to 1902	Russia
1902 to 1909	New Caledonia
1909 to 1917	Rhodesia
1918	United States
1919	India
1920 to 1932	Rhodesia

Due to the World War, in 1918 all foreign mining operations ceased. Hence there was a demand for chromite. The Maryland Chrome Corporation was formed and leased mining rights at Soldiers Delight. The Company reopened the old Choate mine and sunk a shaft 200 feet deep adjoining the original mine. Contemporarily the Chrome Mining Company reworked the Line pits and Wood mine. (11) These operations were quickly brought to a close when the foreign mines reopened in 1919. Since this time the Maryland mines have been idle. It is reported, however, that Harford County produced twenty-five long tons of chromite in 1928. (12) Obviously, however, further chrome mining in Maryland will never be of any importance. Nevertheless, before the greater European and California mines were discovered, they had their day, and they were, as the Encyclopaedia Britannica says "the earliest worked deposits in the world."

Chromium ores were formerly used chiefly in the chemical industries, but the main use of chromium now is in metallurgy. In the chemical industries, chromium is used for the manufacture of pigments, dyes, chemical compounds, and in the tanning of leather. Chrome green, chrome yellow, chrome orange, and chrome red are valuable because of their strength and permanence. Solutions of chromates and bichromates probably find their greatest application



in the dye industries, not so much as a direct dye but as a mordant for fixing and producing "fast" colors. (13) Bichromates and chromic acids are also used in chemical laboratories as oxidizing agents. Chromic salts are used to tan light glove-leather, such as calf, kid, etc. Chrome also makes the leather tougher and water-proof.

The greatest use of chrome ore today is in the manufacture of chromium alloys. In 1922 there was a rapid expansion in the consumption of the chromium alloys and the amount has steadily increased. (14) The principal alloy is ferrochrome, which produces a steel of great hardness and toughness. This chrome steel can be bent cold and can be welded to iron, forming an impermeable surface. Hence its use for armour-plate, burglar proof safes, tires, stamp-mill shoes, etc. Steel containing about thirteen to fifteen percent chromium with one percent nickel or carbon forms an alloy which is impervious to oxidation by water, air, and certain acids. This alloy is known commercially as stainless steel and is used chiefly in cutlery. It also has many other uses in such things as exhaust valves of aeroplane engines, turbine blades, acid pumps, etc.

The newest chromium alloy is known as stellite. It is an alloy of cobalt and chromium. This alloy is the only serious rival to steel, as it takes a good cutting edge, can be run at high speed without softening and is rustless.

The automobile industry is now using chromium plate almost exclusively due to its high permanent lustre. The United States Bureau of Engraving is putting a thin plate of chromium on its electrotypes which are used in printing paper currency. (15)

Although no longer producing any chromium ores, Maryland is still very active in the chrome industry. Ore is shipped to the Mutual Chemical Company of America (The successors to the Tyson Chrome Works) at Baltimore. The ores are here converted to pigments and chromic salts. The Bethlehem Steel Corporation at Sparrows Point, Maryland, is probably one of the largest chromite consumers in the United States. Here the chrome is used not only to form alloys but also to serve as a lining for the basic hearth and refractory furnaces.

It is quite evident that Maryland has given much impetus to the chromium industry; and although future chromite mining in the state is problematic, Maryland will undoubtedly continue to be one of the leading states in the consumption of chrome ores.

(1) Glenn, Wm., Trans. Amer. Inst. Min. Engineers, Vol. XXV 1895, pp. 488-489.

(2) Watts, -- Chemical Dictionary, Vol. II, pp. 152.

(3) Hayden, H. H., Geological Sketch of Baltimore - Letter to Dr. Nathaniel Potter, dated July 12, 1811. Balto. Med. Phil. Lyceum, Vol. 1, pp. 255-271.

(4) Hayden, H. H., Description of the Bare Hills near Baltimore. Amer. Jour. Sci. 1833, pp. 349-360, map.

(5) Personal Observations. Dec. 1932.

(6) Glenn, Wm., Trans. Amer. Inst. Min. Engineers, Vol. XXV 1895, pp. 488-489.



- (7) Knopf, Eleanora Bliss, Chrome Ores of Southeastern Penn. and Maryland. U.S. Geol. Survey Bull. 725, 1922, p. 97.
- (8) Singewald, Jos. T., Maryland Sand Chrome Ores, Economic Geology. Vol. 14, 1919, pp. 189-197.
- (9) Brewer, Q. L., Mine Magazine 1932, Vol. 22, No. 4, pp. 11-12.
- (10) Singewald, J. T., Jr., Md. Geol. Survey, 1928, Vol. XII, pp. 158-159.
- (11) Knopf, Eleanora Bliss, Chrome Ores of Southeastern Penn. and Maryland. U.S. Geol. Survey Bull. 725, 1922, pp. 85-139.
- (12) Singewald, J. T., Jr., Md. Geol. Survey. 1928, Vol. XII, pp. 160-161.
- (13) Rumbold, W. G., Chromium Ores. 1922.
- (14) U.S. Mineral Resources, 1928, Vol. I, Metals.
- (15) Payne, H. M., The Undeveloped Mineral Resources of the South, 1928, p. 34.

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### NOTES

#### General Meetings of the Society

- September 4 - Talk by Mr. W. Bryant Tyrrell - "The Migration of Birds of White Fish Point."
- September 11 - Talk by Mr. Charles Svec - "The Development of Cactus."
- September 18 - Talk by Mr. Edmund B. Fladung - "Aristotle and Linnaeus, the Fathers of Natural History."
- September 25 - Talk by Mr. L. Bryant Mathers - "The History, Functions, and Work of the Junior Division of the Natural History Society of Maryland."

#### Departmental Meetings

- Botany - September 14.
- Entomology - September 19.
- Mineralogy - September 20.

#### Junior Meetings

- September 8 - Election of officers of the Junior Division - Chairman, L. Bryant Mathers; Vice chairman, Richard Webster; Secretary, Ned Crosby; Advisors, Robert Wheeler and David Bachrach.
- September 22 - Planning of Program.

#### Field Trips

Messrs. Edmund B. Fladung and Gilbert C. Klingel of the Department of Ornithology spent a few days on the Patuxent River between Priests Bridge, Defense Highway and Lower Marlboro, for the special purpose of securing notes on river birds.

Mr. John B. Calder conducted a field trip to Governor's Run and Jones Wharf with members of the Biology Club of Forest Park High School.

In addition to the above, many single day trips were taken by Staff members for the purpose of research and collecting. It would be impracticable to list these individually since members of the various departments are engaged in field work weekly and often, in vacation seasons, daily.

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315

The Natural History



Society of Maryland



# BULLETIN

Volume V

OCTOBER, 1934  
Herbert C. Moore, Editor

Number 2

## THE LIFE HISTORY OF THE HUNTING WASP, AMMOBIA ICHNEUMONIA, LINN.

By John A. Frisch, S. J.

Packard (1870) spent several hours observing a number of these wasps, nesting in proximity to one another, and reported that their nest consists of a single cell, the digging of which occupies half an hour. The cell is stored with a single paralyzed meadow grasshopper, either *Orchelimum vulgare* or *Conocephalus fasciatus*.

The Peckhams (1898), studying a single wasp they chanced upon in the act of starting its nest confirm Packard's report, but state that it takes the wasp four hours to build its nest.

Davis (1911) is the first to report a nest consisting of two cells, one cell containing three individuals of *Atlanticus dorsalis*, and the other five. He also reports a wasp carrying a specimen of *Neoconocephalus triops*.

Hancock (1911) reports two nests consisting of two cells each. Three of the cells contained two specimens of *Neoconocephalus ensiger*; the fourth cell contained in addition a specimen of *Orchelimum vulgare*. He also reports that the egg is placed on the last grasshopper brought in and not on the first as reported by Packard and Peckhams.

All these reports are based upon chance findings of the wasp engaged in nest building. No systematic study has been made of this wasp. To check the conflicting statements of these observers and to fill in the gaps in our knowledge the author made a systematic study of this wasp during three summers on the grounds of Woodstock College, Woodstock, Maryland. A number of experiments bearing on the question of intelligence in wasps, and on the variability of the instincts of these wasps were conducted at the same time. This preliminary report deals only with the facts of the life-history of the wasp. Variations in habits and instincts will be reported separately.



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At Woodstock College, *Ammobia ichneumonina* makes its appearance during the first week of June. But nest building does not begin until several weeks later. The first nests were observed during the third week in June and the nest building continues until the third week in September. These nests are built in the ground. They consist of an entrance tunnel, about a quarter of an inch in diameter, which extends into the soil at an angle of about 85 degrees for about five inches. From this main tunnel, branch tunnels extend at right angles for about one inch, and then enlarge into cells. These cells are oval chambers, one and three quarters inches in length and three quarters of an inch in width. On an average three such cells are found in the nest, though one two story nest of seven cells was found.

These cells are stored with two varieties of grasshoppers, *Neoconocephalus ensiger* during the first half of the season and *Conocephalus attenuatus* during the latter half of the season. The number of grasshoppers per cell varies from an average of 3.7 to cells containing as many as six.

These grasshoppers are immobilized, though not killed, by three stabs of the wasp's sting. The first stab is in the ventral surface of the neck, in the region of the suboesophageal ganglion. The second stab penetrates the membranous cuticle on the ventral surface, between the first and second pair of legs. The third stab penetrates the cuticle between the second and third pair of legs. In both of the latter cases, however, the sting is inserted somewhat to one side of the midline and nearer to the coxae of the legs. The sting, however, is directed toward the mid-line of the body. The first sting in the neck completely immobilizes the grasshopper. The paralyzed grasshoppers live from eight to twelve days.

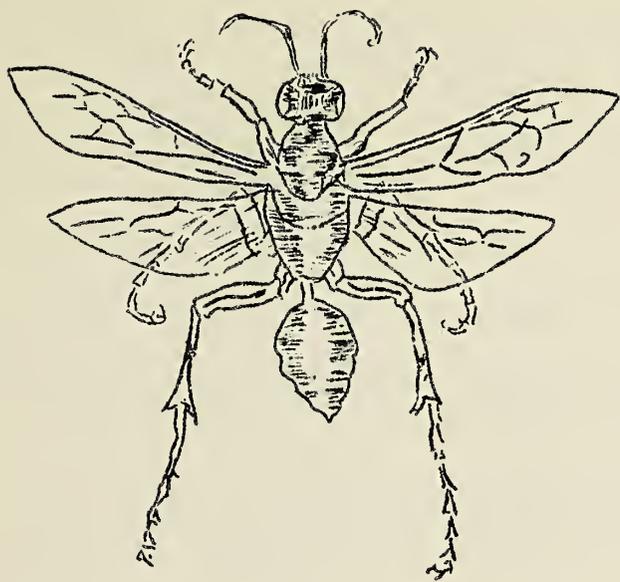
The egg is crescent shaped and about 6 mm. long and one mm. wide. It is usually glued to the ventral surface, between the first and second pair of legs, near to the coxa of the first leg. In some cases it is glued to the ventral surface of the neck. In both cases it lies transversely across the body. The egg is always laid on the first grasshopper deposited in the cell.

The egg hatches in about forty-eight hours. The larval period lasts eight days, though as the end of the season approaches it is shortened to five days. Additional food may prolong the larval period to 11 days. When food is abundant only the soft viscera of the thorax and abdomen are consumed, but when food is scarce, the chitinous skeleton and even the legs are consumed. Katydid's paralyzed by *Ammobia pennsylvanica* are accepted as food, even after the larva's original store of grasshoppers has been consumed. Crushed crickets are also accepted. Dead and partially decayed grasshoppers are accepted and consumed, apparently without any deleterious effects.

The cocoon consists of six layers of silk and the usual chitinous inner shell. The size of the cocoon varies from 3.3 cm. in length and 1.2 cm. in width for large larvae to 2.3 cm. in length and 0.9 cm. in width for small larvae. The cocoons remain in the ground all winter and the wasps hatch in the early days of June. In one case a larva which spun its cocoon on June 29, hatched on July 15 of the same season.

The following parasites were recovered from *Ammobia* nests,

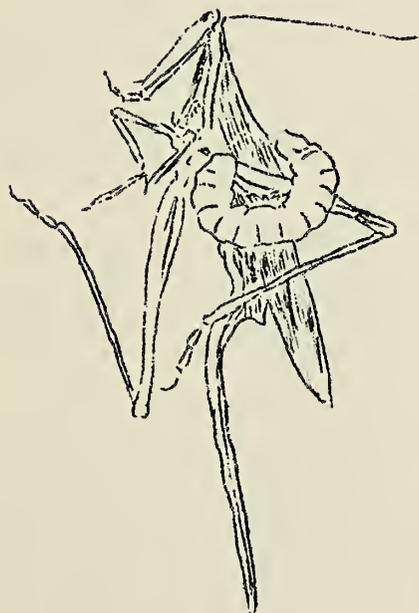




*Ammobia ichneumonina*



*Neoconocephalus ensiger* with  
egg of *A. ichneumonina*



*Neoconocephalus ensiger* with larva  
of *A. ichneumonina*



Cocoon of *A. ichneumonina*



either as larvae or pupae: *Metopia campestris* (Fall)\*, *Metopia leucocephala* (Rossi)\* and *Senotainia trilineata* (V.d.W.)#. Another parasite, *Dibrachys* n.sp.\*\* both male and female, was recovered from cocoons.

\* Both determined by J. M. Aldrich, Bureau of Entomology, U.S. Department of Agriculture.

# Determined by C. T. Greene, Bureau of Entomology, U.S. Department of Agriculture.

\*\* Determined by A. B. Graham, Bureau of Entomology, U.S. Department of Agriculture.

#### References

Packard (1870): *Guide to the Study of Insects*, 2nd edition, p. 167.

Peckham, G.W. and E.G. (1898): *On the Instincts and Habits of the Solitary Wasps*. Wisconsin Geological and Natural History Survey, 2.

Davis, Wm. T. (1911): *Miscellaneous Notes on Collecting in Georgia*. *Journal, New York Entomological Society*, Volume 19, p. 218.

Hancock, Joseph Lane, (1911): *Nature Sketches in Temperate America*. A. C. McClurg and Company, Chicago, pp. 195-201.

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#### NOTES ON A BREEDING WARBLER, THE REDSTART (*SETOPHAGA RUTICILLA*)

By Irving E. Hampe

The Redstart is one of the most abundant of the warblers observed during migration at the Patapsco State Park, Glenartney, Maryland. My records from 1931 to the present time place the date of arrival as April 29. This is the earliest recorded date. The latest date recorded was May 3. For several weeks the Redstarts are abundant. However, they soon move northward, leaving but a few of the species that breed in this locality.

During the nesting season I have searched diligently for a nest of this species. On June 15, 1932, I observed a pair building a nest in a small tree, but a week later it was deserted. During 1933 I continued my search but was unsuccessful.

This spring I observed a pair building a nest in a Black Willow. The nest was placed in a crotch on a branch about fifteen feet from the ground and eight feet out from the trunk of the tree. Climbing the tree and edging out on the branch as far as I could go with safety, I could just touch the nest with my fingers. Fearing the birds would desert the nest if frightened by my presence I climbed down, after ascertaining there were no eggs. This concluded my observations on that day, May 12.

The next visit was made on May 20. The female flew from the nest as I climbed the tree. Reaching out I felt two eggs in the nest. I carefully picked one out and while straddling the branch I made a drawing in my note book of the egg and noted the colors. It was white, speckled about the larger end with cinnamon brown blotches. The size, taken later from my drawing, was 16x10 mm. I replaced the egg and returned to the ground where I watched from

THE UNIVERSITY OF CHICAGO  
DEPARTMENT OF CHEMISTRY  
540 SOUTH EAST ASIAN AVENUE  
CHICAGO, ILLINOIS 60607

RECEIVED  
JAN 15 1964  
FROM  
DR. J. H. GOLDSTEIN  
100 EAST WASHINGTON STREET  
ANN ARBOR, MICHIGAN 48106

Dear Dr. Goldstein:  
I have received your letter of January 10, 1964, regarding the  
loan of a copy of your paper, "The Structure of the  
Liquid Phase of Polystyrene," to the University of Chicago.  
I am sorry that I cannot return the copy to you more  
quickly, but it is being held by the library.  
I am sure that you will find the copy useful.  
Very truly yours,  
J. H. Goldstein

Yours sincerely,  
J. H. Goldstein

Enclosed for you are two copies of the paper, "The Structure of the  
Liquid Phase of Polystyrene," by J. H. Goldstein and  
J. H. Goldstein, published in the Journal of Polymer Science,  
Part A, Vol. 2, pp. 1-10, 1964.

I am sure that you will find the paper of interest.  
Very truly yours,  
J. H. Goldstein

I am sure that you will find the paper of interest.  
Very truly yours,  
J. H. Goldstein

I am sure that you will find the paper of interest.  
Very truly yours,  
J. H. Goldstein

a clump of shrubs. After half an hour the female had not returned and I left. The male was not observed at any time on this date.

On May 26 I again visited the nest. This time I felt four eggs in the nest. Not caring to handle the eggs too much, and not being able to get in a position where I could see them, I withdrew. Neither the male nor female was seen during this visit.

On June 2 I found the female on the nest. She did not fly off until I reached out. The foliage by this time had become so thick I could not see her, and the sudden flight from the nest nearly caused me to fall from my precarious position. Then the male Redstart joined his mate and the pair flew about uttering shrill cries. After noting there were still four eggs I quickly climbed down. The female flew to the nest immediately but was lost to my view since the foliage hid the nest. The male, after singing for a short time from a nearby tree, soon flew away.

My next visit was on June 9, during a rainstorm. As I put my fingers into the nest I touched three young Redstarts. Three wide open mouths raised upward begging for food. The young ones were about half grown. Since there was no sign of the fourth egg, it evidently had been infertile and had been disposed of by the parent birds. The branch was sagging so much I feared I would knock the young from the nest. I descended and from a distance watched for the parent birds. In a few minutes the female appeared and flew to the nest, but the foliage prevented me from observing her further actions.

A week later, on June 16, I again visited the nest site. Observing no movement about the nest I climbed out on the branch. As I suspected the nest was deserted. In a nearby tree I saw a juvenile Redstart, perhaps one of the three.

A week later I collected the nest which I now have before me. It is a beautiful cup-shaped affair, saddled between two branches. The outside consists of plant fibers cleverly woven together, and the inside is lined with grass. The measurements are as follows:

Depth: outside - 2 inches; inside  $1\frac{1}{2}$  inches.  
Diameter: outside -  $2\frac{1}{2}$  inches; inside 2 inches.

This was the only nest of this species I observed this year.

Redstarts were fairly common throughout the summer in this locality until September 9. None was noted from that time until September 28, when one male was seen. This was probably a straggler, for my records show they leave about the first of September.

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RELATION BETWEEN THE RATE OF FORMATION OF THE FOOD VACUOLES  
AND THE RATE OF PULSATION OF THE CONTRACTILE VACUOLES IN  
PARAMECIUM MULTIMICRONUCLEATUM

The observations were made on individuals sealed in vaseline enclosures under cover glasses. The rate of pulsation of the posterior contractile vacuole and the rate of formation of the food vacuoles in given individuals were fairly constant. In different individuals the rate of pulsation of the posterior contractile



vacuole varied from 10 to 30 seconds: the rate of formation of the food vacuoles varied from 21 to 64 seconds. These variations were directly related. There were from 2 to 3.5 pulsations of the contractile vacuole for every food vacuole formed, and this was independent of the time required for the formation of the food vacuole. This correlation was close enough to warrant the assumption that the main factor determining the rate of pulsation of the contractile vacuole is the rate at which water is taken in by the cytostome during feeding. This assumption is supported by the author's previous findings that when specimens are actively swimming and not feeding, the contractile vacuoles do not pulsate.

John A. Frisch, S. J.

### Department of Entomology Report

The members of the Department of Entomology held their first meeting of the fall season on September 19, and succeeding meetings on October 3 and October 17. It is the plan of the department to hold meetings as far as practicable on the first and third Wednesdays of each month. As per a tentative arrangement each meeting will be divided into four parts. Part One will consist of a lecture course and school, given by one of the assistant curators; Part Two, a report by one of the members on an entomological topic of general interest as a result of research, compilation, or observation; Part Three, a short laboratory period in anatomy or taxonomy; and Part Four, a general discussion of entomological problems by the entire membership. Several of the staff have pledged themselves to prepare lectures of a popular character to deliver to clubs, schools, or other laymen's associations.

Insect specimens will be greatly appreciated by the department, as they are needed to complete collections and for locality records. All Society members are urged to submit date and place of collecting along with the specimen. Any department member will be glad to accept specimens at any time.

### NOTES

Trustees Meeting - October 28 - Discussion of plans of Society for Fall term.

General Meetings and Lectures of the Society

October 2 - Talk by Mr. Charles Ostrander - "The Department of Mineralogy."

October 9 - Talk by Mr. William Hassler of the American Museum of Natural History - "Songs and Mating of Frogs and Toads." Illustrated with motion pictures.

October 16 - Talk by Mr. Oscar Helm - "Evidences of Evolution in Comparative Anatomy."

October 23 - Talk by Mr. Jack Whiteman of New Mexico - "History of the Indians of New Mexico."

October 30 - Opening of Society's Lecture Season. Lecture by Father John A. Frisch - "Ants and Their Ways." Illustrated with lantern slides.

Special Meetings - Entomology - October 3, 17; Mineralogy - October 27.

Junior Meetings - General meeting, October 6; Lecture by Father John A. Frisch - "Ants and Their Ways." Illustrated.

Exhibits - October 1 - Exhibition at Enoch Pratt Library, Central Branch, in conjunction with the Library's exhibits about "Books to Be Written about Maryland."

October 12, 13, 15. Junior Exhibit. This display of the work of the Junior members received much favorable comment. Over 450 people attended the exhibit.





## BULLETIN

Volume 5

NOVEMBER, 1934  
Herbert C. Moore, Editor

Number 3

### EXPOSURE OF ARUNDEL MEMBER OF THE MARYLAND LOWER CRETACEOUS ON WASHINGTON BOULEVARD NEAR LANSDOWNE

By L. Bryant Mather, Jr.

The beds which comprise the Arundel member of the Cretaceous formation are very well exposed in a small gully cut by an infant intermittent stream in the bank on the north side of the Washington Boulevard. This small ravine which is only a few hundred yards in length varies from thirty to forty feet in height at its mouth to practically nothing at its head.

As one enters the dry stream bed from the highway, the first mineralogical feature which is noted is the red-brown character of the sediments which are exposed. This is caused by the large quantities of iron-oxides present. The first consolidated rock is seen as angular boulders in the stream bed itself. These are easily recognized as iron stone or "pudding-stone" conglomerate; i.e. quartz pebbles cemented by iron minerals. The iron minerals which form this conglomerate and which form beds themselves are 1. Hematite (Red-iron oxide -  $\text{Fe}_2\text{O}_3$ ); 2. Limonite (Brown iron oxide -  $2\text{Fe}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ ); and 3. Siderite (Gray iron carbonate -  $\text{FeCO}_3$ ). The occurrence of these minerals in the Coastal Plain deposits of this region has played a great part in Baltimore's becoming a center in the iron-steel industry. For example, it was ore mined from these ore banks that supplied the iron which was used in the making of cannon and balls for the American defenders in the War of 1812.

Some few of the specimens of limonite collected at this locality show cellular ligniform structure. This shows that the iron oxide has replaced the vegetable matter of the Cretaceous trees atom for atom, retaining ligniform characteristics. Such an occurrence is known as a pseudomorph or false form. The average specimen of limonite has no characteristic form of its own, being an amorphous substance.

This limonite pseudomorph, however, is not the only evidence which is here preserved of the Cretaceous forest. In one layer of



clay near the head of the ravine many feet below the surface is found lignitized wood. This lignite is formed by the partial carbonization of wood, and constitutes one of the intermediate steps in the formation of coal. Physically the lignite looks quite like charcoal, although it is much heavier and retains more of the woody texture. One specimen which I collected at this locality measures  $25\frac{1}{2}$ " x  $9\frac{1}{2}$ " x  $3\frac{1}{2}$ " and is on display at the Society's Headquarters.

Several unusual specimens of limonite discovered here have cavities in them which have been caused by their concretionary origin. These cavities in some cases have a lining of drusy crystals. These crystals have a shiny, velvety appearance and have been chemically determined as Manganite ( $MnO_2$ ). This mineral in so far as I can determine, has not been reported from this vicinity of Maryland heretofore.

Catalogue of minerals from this locality:-

- |                |                                |
|----------------|--------------------------------|
| 1 - Limonite * | 5 - Manganite                  |
| 2 - Hematite   | 6 - Quartz                     |
| 3 - Siderite   | 7 - Kaolinite (clay)           |
| 4 - Lignite    | * both amorphous and ligniform |

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#### FOUR NEW MINERALS FOUND IN THE COCKEYSVILLE MARBLE

By Charles W. Ostrander

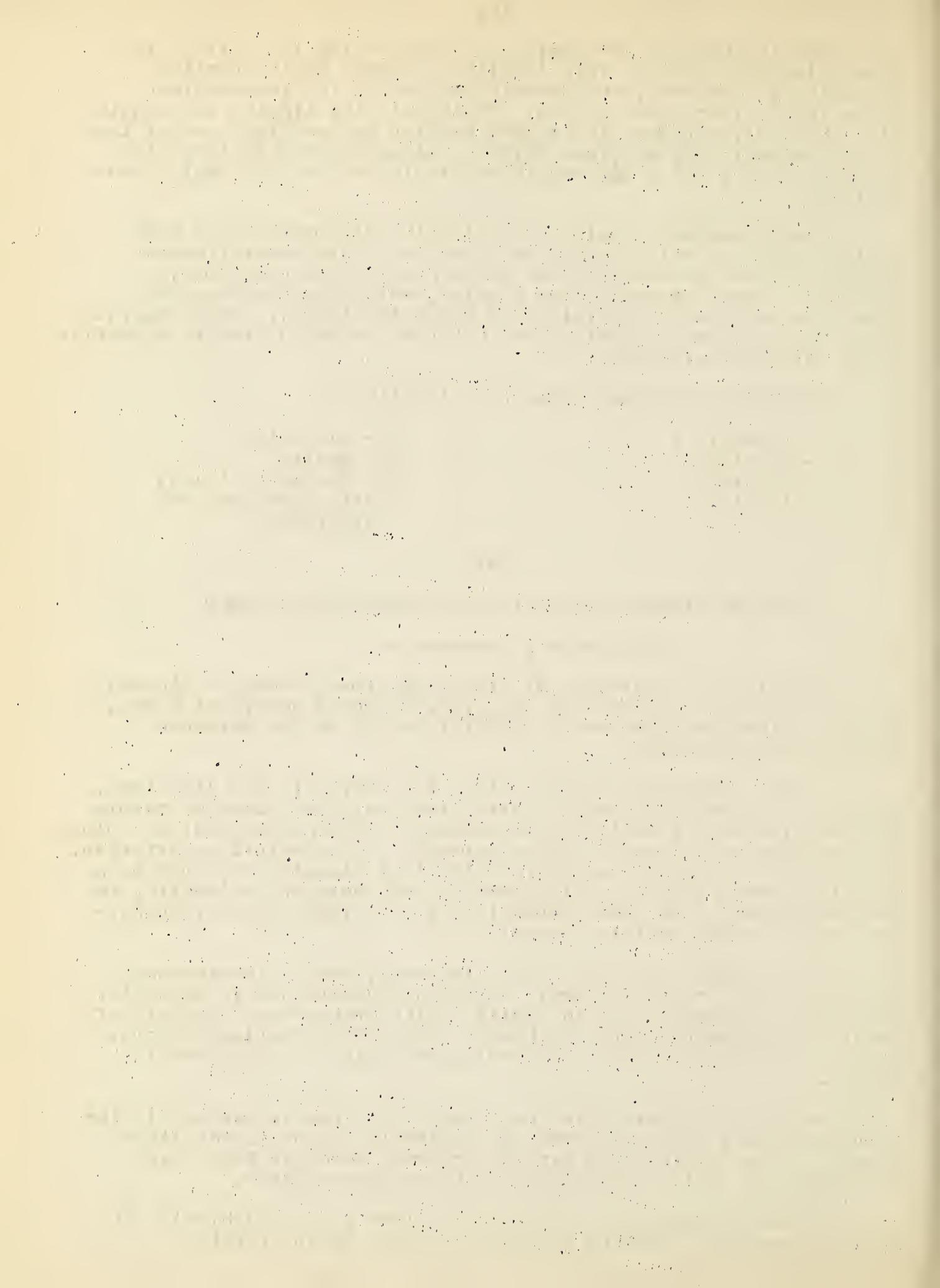
Recently the Department of Mineralogy found four new minerals in the Cockeysville Marble at the T. C. Campbell Quarry at Texas, Maryland, that are unreported by Williams (1) or the Maryland Geological Survey (2).

In what must have been one side of a cavity in the limestone, which was covered with pink calcite crystals, were cubes of purple fluorite (calcium fluoride), presenting a pleasing contrast in color. The crystals had a purple center surrounded by a colorless exterior. We believe that this is the first time that fluorite has ever been reported from the Cockeysville Marble. The only other locality in Maryland known to us where fluorite has been found is near Cumberland where a pink variety occurs.

In veins and cavities in the limestone, barite (barium sulphate), a white opaque mineral, was found massive and in crystals. The tabular crystals were in cavities with transparent crystals of calcite. Although barite has been reported from Maryland before, this is the first record of its being found in the Cockeysville Marble.

Another new mineral for the Cockeysville Marble was sphalerite (zinc sulphide) which was found in cleavable masses in the limestone. It was of the dark variety commonly known as Black Jack. Sphalerite is easily recognized by its resinous luster.

The most recent find was that of galena (lead sulphide). It occurred in small crystals in veins of white opaque barite.



This shows that records of mineral occurrences heretofore published are incomplete as references, and that extensive field work must be undertaken to get a complete check list of Maryland Minerals.

(1) Notes on the minerals in the neighborhood of Baltimore, G. H. Williams, J.H.U., 1887; also contributions to mineralogy by the latter.

(2) Maryland Geological Survey of Baltimore County.

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## NOTES ON THE LIFE HISTORY OF THE COMMON SUCKER (*CATOSTOMUS COMMERSONI*),

By Joseph C. White

One of the many fish which migrate from one type of habitat to another for spawning is the Common Sucker. It lives principally in large rivers and lakes but travels in the early spring to shallow waters to breed. Usually, it grows to about twelve inches, rarely larger. The upper part of the body is olivaceous; the lower, whitish. In spring males have a rosy lateral stripe.

On April 8, 1934, two males measuring ten and eleven inches in length were taken in Bull Branch at Glenartney, Maryland. An examination of each fish showed that the milt was free, and when pressure was applied in front of the vent the milt flowed very freely.

Two hundred yards down stream a female measuring eleven and a half inches was found dead. Her ovaries were full of ripe eggs (approximately 4,500) which varied in size, the largest being two mm. in diameter.

The next record was taken on June 18, when fry each measuring about eight mm. were found in large numbers in the same stream. A week later slightly larger fry were caught in the Patapsco River near the point where Bull Run empties into it. On July 21, the young in the river were forty-five mm. in length.

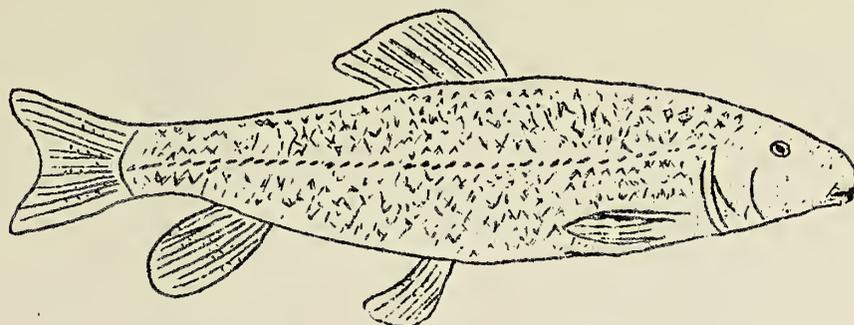
A few specimens caught on August 5 in Bull Run measured fifty-four mm. At this time the fish seemed to be leaving the smaller streams and taking to deeper waters. Only a few were seen.

Nearly two months later on September 28, a young sucker forty-five mm. long was caught in the swamp at Vineyard. Since the swamp seemed too small to support any breeding size fish, the young one must have been washed there from a nearby stream during a storm.

All during September and October the number of fish of this species was decreasing in the small streams until on October 28, not a specimen could be found.



An examination of the mouth of this fish shows that it is papillose, and adapted to a bottom feeder; that is, located on the under part of the head, and not in the front as in other fish.



The Common Sucker  
(*Catostomus commersonii*)

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#### NOTES ON PERAMIMUM PUBÉSCENS (THE DOWNY RATTLESNAKE PLANTAIN)

By Earl H. Palmer

If one is very fortunate while walking through the woodlands in July or August he may see this beautiful uncommon but not rare member of the Orchid family. Although I have been visiting a particular locality (Falls Road near Rockland) for several years this last summer was the first that I have noted this species in blossom.

It was found growing on a hillside with a 45° slope in the shade of a beech tree. The soil (Manor loam) was moist from recent rains. At the foot of the hill, a little pond gives a moist touch to the atmosphere, which is so important to the growth of orchids.

The plant is easily recognized by the peculiarly veined leaves which grow in a rosette-like cluster at the base of the spike. They are ovate, thick and velvety to the touch. The leaves are dark green with olive green veins while the midvein has a narrow white border on both sides of it.

The spike is very downy, "densely glandular-pubescent," and has a few lancelet scales. The spikes vary in length from eight inches to twenty inches high. The flowers are creamy-white, sessil, and saccate; the roots, thick fleshy fibres which grow just below the surface of the soil. I have even noticed the roots growing above ground.

(Figure 1 after Britton & Brown; Figures 2 and 3 from specimen).

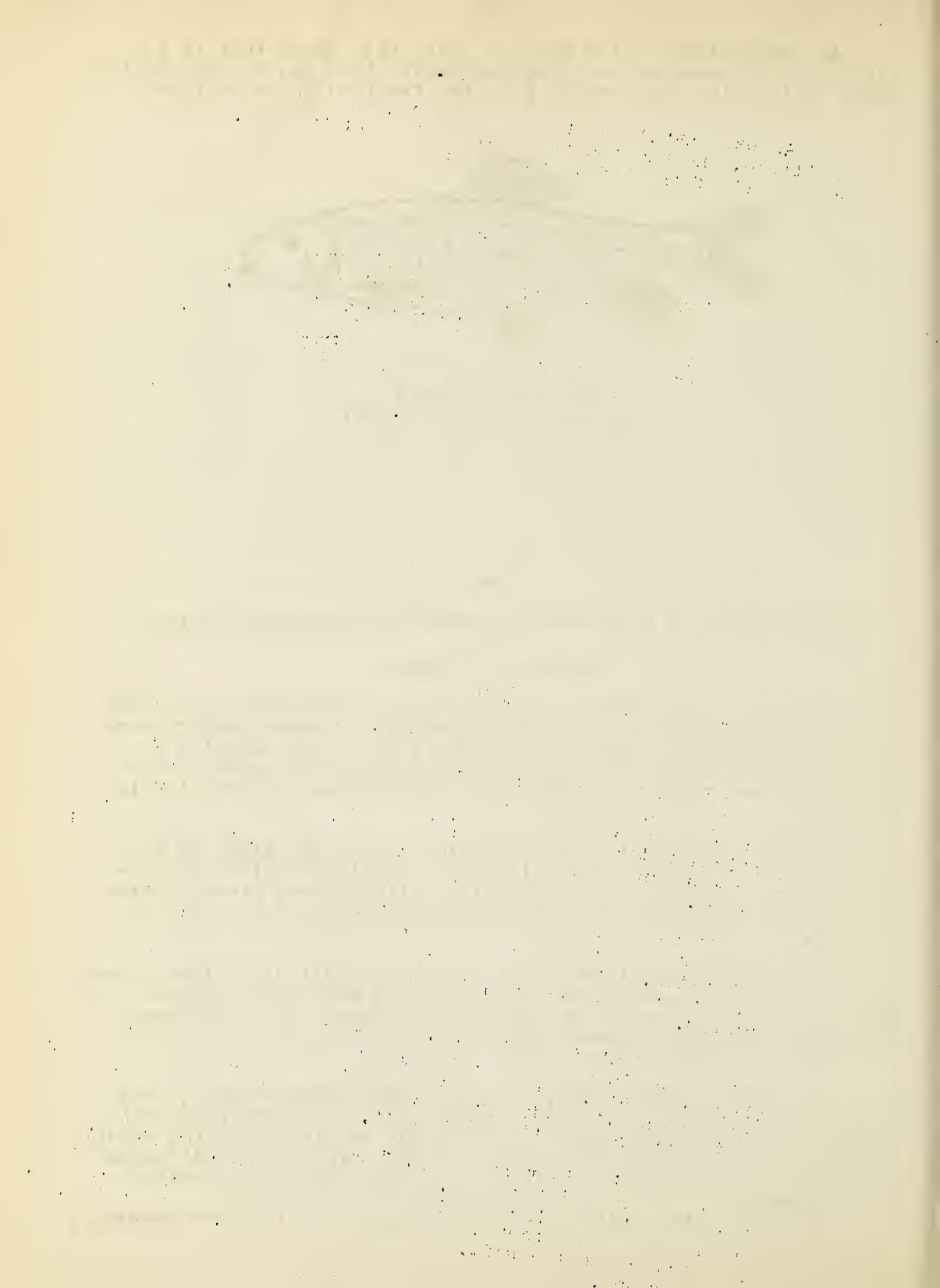




Figure 1

PERAMIUM  
PUBESCENS

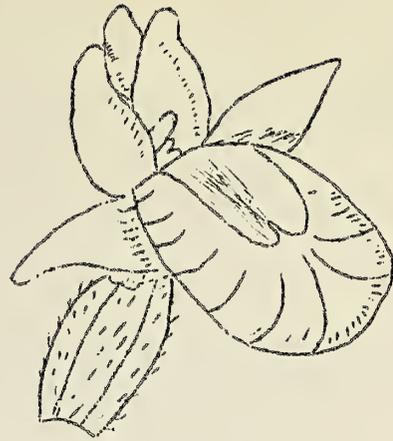


Figure 2

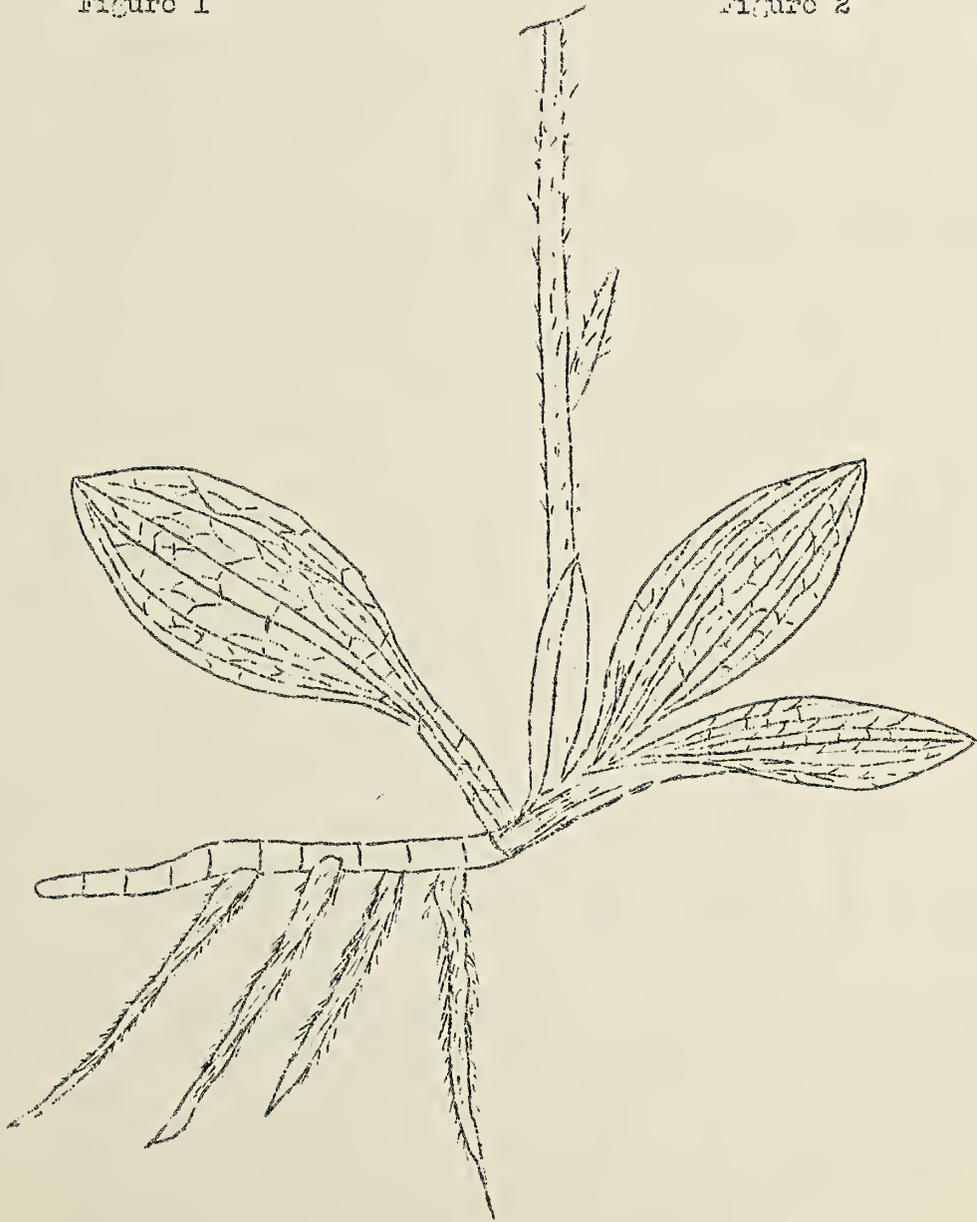


Figure 3



NOTESGeneral Meetings and Lectures of the Society

- November 6 - Talk by Mr. George Maugans - "Archaeological Excavations at Safe Harbor, Conowingo." Illustrated with motion pictures.
- November 13 - Talk by Mr. Frank Yingling - "Fish Collecting and Preservation."
- November 20 - Father William McClellan - "Notes and Studies of the Lizards of Maryland."
- November 27 - Lecture by Dr. John J. Rutledge of the Maryland Bureau of Mines - "The Coal Deposits of Maryland."

Lectures to Outside Organizations

- November 2 - Lecture to the First Form of the Gilman Country School by Mr. Gilbert C. Klingel - "Bird Life."
- November 4 - Lecture to the Young Peoples' Club, Holy Nativity Church, by Richard Webster. Subject - "The Hunting Wasp."
- November 14 - Lecture to Parents and Teachers Association at Essex School by Mr. H. Charles Robertson - "Maryland Snakes."
- November 15 - Lectures to Upper and Lower Schools of the Gilman Country School by H. Charles Robertson - "Poisonous Snakes."
- November 16 - Lecture to the Civilian Conservation Corps by Dr. Howard A. Kelly and Mr. H. Charles Robertson. "Snakes of the World."
- November 23 - Lecture to Troop 29, Boy Scouts of America, Edmondson Avenue and Grantley Street, by Mr. H. Charles Robertson. "Snakes of Maryland."
- November 2 - Lecture to troop 69, St. Johns M. P. Church by Mr. L. Bryant Mather, Jr. "How Coal is Formed."

Exhibitions

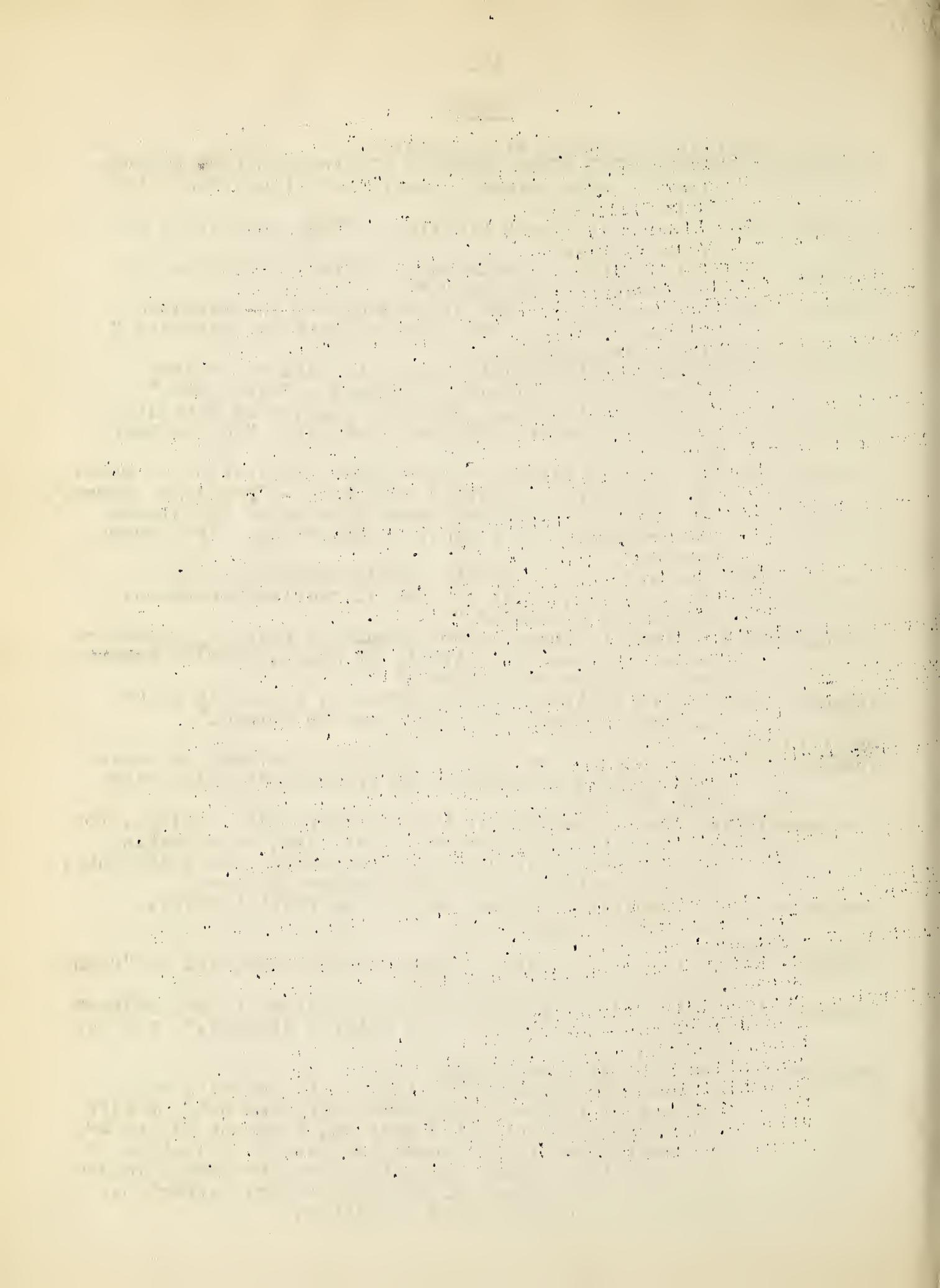
- November 1 to 30 - Exhibit of Natural History specimens of marine life typical of Maryland at the Gwynn's Falls Park High School.
- November 13-16, 19-21 - Exhibit at the Baltimore City College, for the Parents and Teachers Association, representing the day school students and the night school students. Natural History work of our Junior Division.
- November 16-30 - Exhibit at Branch #26, Enoch Pratt Library. Minerals of Maryland.

Junior Meetings

- November 3 - Meeting with lecture by Mr. Milton Oler, Sr. on "Making Plaster Casts of Leaves."
- November 17 - Fathers' and Sons' Night with lecture by Mr. Gilbert C. Klingel on "Benefits of Natural History." Tea was served.

The Maryland Outdoor Life Convention

A number of our members attended the meeting and banquet of the very successful Maryland Outdoor Life Convention held at Hotel Emerson, November 21 and 22. On exhibition at the Convention were a collection of the Society's nature photographs and the Model Indian Village. Mr. Edmund B. Fladung and Mr. Herbert C. Moore were the Society's delegates.



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*The Natural History*



*Society of Maryland*



**BULLETIN**

Volume V

DECEMBER, 1934  
Herbert C. Moore, Editor

Number 4

SOME HAUNTS OF *LYGOSOMA LATERALE* IN SOUTHERN MARYLAND

By William H. McClellan, S. J.

If the diminutive Ground Skink, *Lygosoma laterale*, is not generally classed among Maryland's lizards, the omission is not surprising. The generous and hospitable people of the southern counties are scattered over their fields, with few considerable towns, and few public lodgings where a stranger collecting zoological specimens might readily find a few days' accommodation. On the other hand, a private guest among them would rarely have interest enough in herpetology to improve the opportunity in that direction. It has merely been my own chance to combine such an interest with the leisure hours of a priest on transient duty and on yearly vacation.

It must have been in 1921 that I first recognized *Lygosoma* in St. Mary's County. The place was a large tract of timber between the Three Notch Road just north of Ridge and the main State Road opposite St. Peter Claver's Church. On a sunny day in April the lizard was basking on the upturned edge of a large fallen leaf, which its weight was not enough to disturb. I had a perfect view of the animal's figure and outer organs, and of the golden-bronze back bounded by the darker stripe along the side. But when I withdrew to prepare for a capture the lizard escaped unseen.

My captive specimens later came from another woodland tract nearby, just west of Beechville and extending south from St. Ignatius' Church to near the sources of Smith's Creek. Here there is a larger proportion of heavy pine. In most respects *Lygosoma* shares the habits of *Eumeces quinquelineatus* (the Five-Lined Skink), which is very abundant in the southern counties; but the latter's favorite tree is white oak, with sweet gum and swamp willow as second choices, whereas *Lygosoma* seems more at home in pine. Moreover, while both these skinks require more moisture and less direct sunshine than the Swift, it seems that *Lygosoma* can thrive in slightly dryer quarters than *Eumeces*. However, they have enough in common to frequent together the woods of St. Mary's County. Treading softly on pine-needles along the abandoned timber-trails, one often hears the sharp rustle of a *Lygosoma* darting to cover. Even then, if the eye can catch a parting



glimpse, the small brown body and wriggling motion closely resemble those of a newt, and the lizard must be seen at rest and close at hand to be recognized with certainty. In these woods, at any rate, I have uncovered two of them from their bark shelters in a single morning's hunt.

My largest specimen, somewhat over four inches long, was brought me by two Boy Scouts of St. Aloysius' Parish, Leonardtown. Of all places, they had picked it up beside the main street (here the State Road) just opposite the Rectory where I was staying, and "thought I might want it". This was early in May, 1934. Inquiry revealed that our opposite neighbor had recently stocked his back yard with cord-wood, the bark of which must have sheltered the lizard until it started in quest of deeper solitude and was noticed by the boys.

Perhaps few naturalists have seen a young *Lygosoma* in the act of emerging from its egg, yet Maryland has afforded even this novelty. From the wood below St. Ignatius' Church I received a female specimen captured by one of our students. The next day (about July 1st) she laid three eggs, of which, unfortunately, I have no recorded measurements; they must have been about 7 x 5 mm. In a medium of damp sawdust one of them somehow disappeared, possibly by shrivelling. The other two developed normally. At the end of about six weeks I brought them out to show to some friends, and found one of the young already out, and coiled, skink-fashion, in a perfect circle on the surface of the sawdust. It might have rested on a lady's thumb-nail with room to spare. On digging out the remaining egg, we immediately noticed a movement within the shell, and the next moment the lizard's head came through it while three of us were looking on. At the time, however, it was impossible to find food for the tiny creatures, and they were taken to the woods and released.

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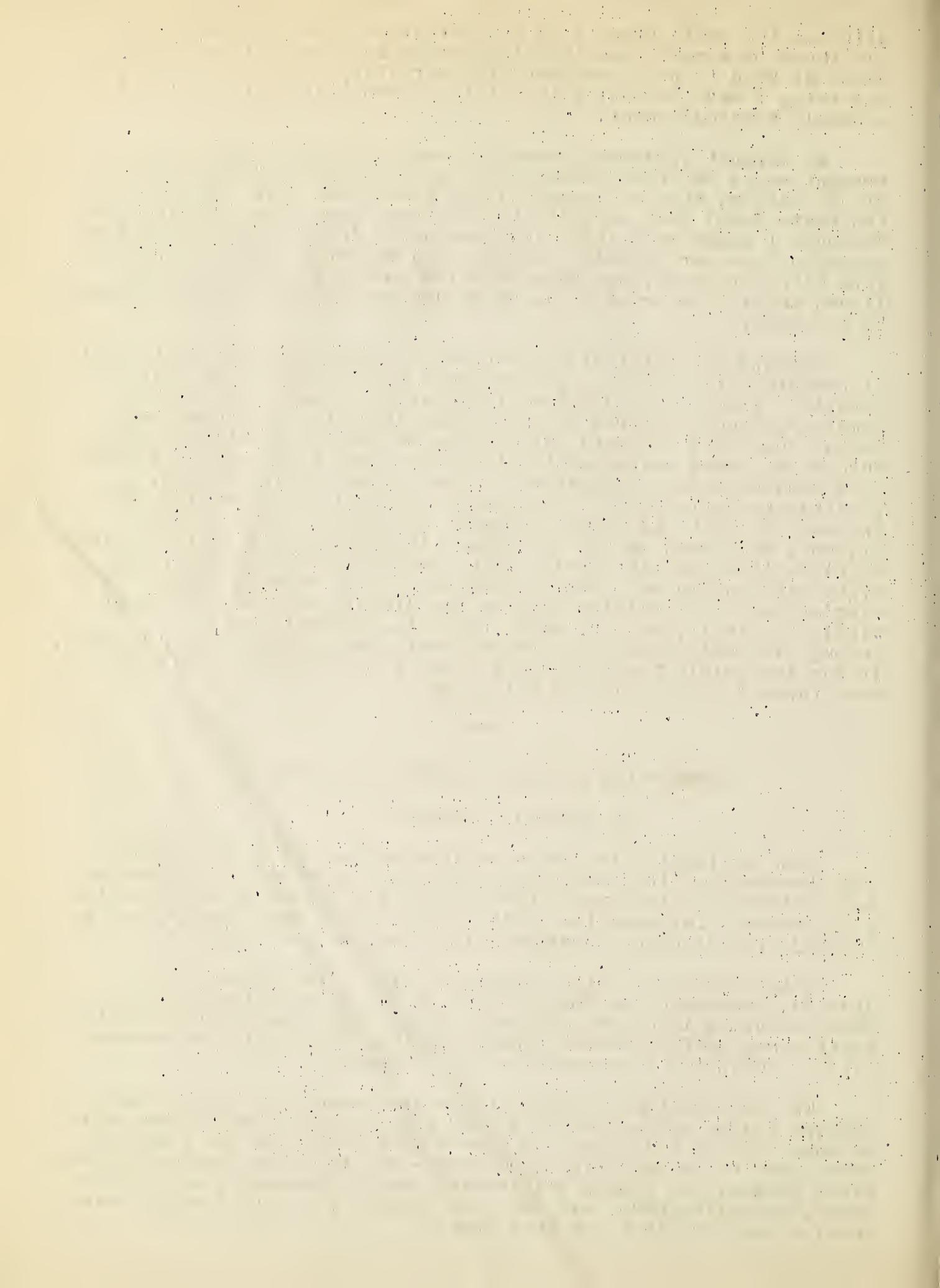
## MOUTH-ROT, A COMMON DISEASE OF SNAKES

By Carroll E. Wagner

From available literature on this subject (1), and from my own observations it appears that mouth-rot in snakes is a purely local disease of the gums. However, in some cases it develops into a deep-rooted inflammation of the jaw-bone and oral cavity, and in the majority of cases terminates in a generalized sepsis.

Klingelhoefer (1) differentiates between two forms of the disease, the acute, or "mucous form of mouth-rot," to which the snake succumbs in a few days, and the chronic form, from which the reptile may suffer several months and then may die or recover. This he calls the "caseous form of mouth-rot."

The observations recorded below are drawn from indigenous and foreign poisonous and non-poisonous snakes, all of which were sick or suspected of being so. Of United States species the following were found to be suffering from mouth-rot; three Blacksnakes, seven Water Snakes, one Timber Rattlesnake, two Copperheads, one Chicken Snake, one Milk Snake, and one Corn Snake. The only foreign snake studied was a Rainbow Boa from Brazil.



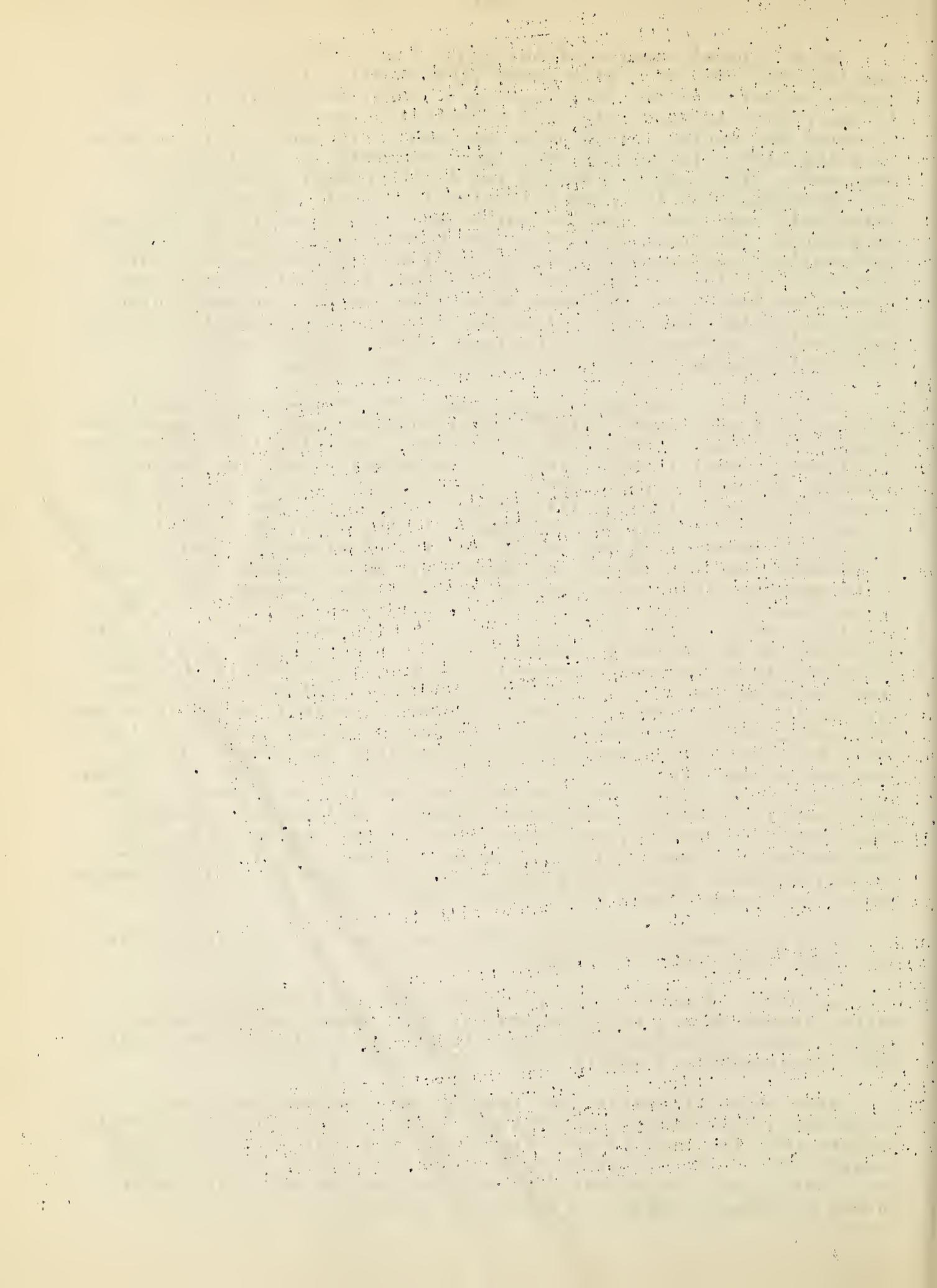
As a typical example of the acute form of the disease, we may take the case of a Milk Snake (*Lampropeltus triangulum*). This snake, captured in the early spring of 1934, was apparently lively and normal in captivity, fed voluntarily, and the tongue movement was rapid. After about two months it gave the impression of being sick. It refused food, and movements of the tongue became rare. The snake no longer lay in its normal position; it was stretched with its head held high in the air and was comparatively restless. Twenty-four hours after these first symptoms of illness, the upper and lower jaws were seen to be badly swollen. The swelling progressed to such a point within twenty-four hours that the snake's head appeared to be about twice its normal size. Around the teeth tiny postular spots were found. The snake died suddenly, with spasmodic coiling and a wavelike contraction of the belly wall. Autopsy showed the inner organs macroscopically practically unchanged, but well filled with blood.

As an example of the chronic course of mouth-rot we take the history of a Blacksnake (*Elaphe obsoleta obsoleta*). This snake was caught at the same time as the Milk Snake, and likewise was at first completely normal in captivity, fed voluntarily, and the tongue movement was very quick. After two months (a week before the Milk Snake) the first signs of illness were observed. The snake took no more water or food, lay abnormally in the cage, and almost ceased making any movement of the tongue at all. A slight reddening of the membrane of the throat was observed. After several days, tiny white caseous clumps were noticed on the mucous membrane of the upper jaw. The mouth did not close completely. The body appeared swollen. This condition lasted over a month, during which time the snake lay in an abnormal position, the head held high, often at an angle of ninety degrees. Several days before the reptile's death, the following conditions were noted: swollen inflamed upper right jaw; in the front portion, mucous membrane partially necrotic around the teeth, heavily covered with a yellowish caseous deposit which could be very easily detached; the upper left jaw showed similar changes and was likewise covered with a necrotic membranous tissue. The front part of the lower jaw-bone was visible and seemed to be eaten away; the mucous surface was greatly swollen, hemorrhagic, gelatinous, oedematous, and covered by a thick caseous film. In the back of the oral cavity the mucous membrane was likewise inflamed, swollen, oedematous, with a purulent necrotic film. Autopsy showed the inner organs to be filled with blood.

It is interesting to note that a snake with this disease cannot completely close its mouth.

A number of methods of treatment were tried such as tepid baths, warmed cages, bathing-pool for the snakes, sunning under Violet lamps. The most successful treatment was bathing the mouth with Hexylresorcinol Solution S.T. 37 (Sharpe & Dohme).

From other literature and from my own observations I have found that, generally, contributory factors to the disease of mouth-rot are that the cage is not warm enough and that it is not moist enough. The best preventive is to have the cage in a well heated place with a good sized bathing-pool for the snakes. This water should be changed often and warm water added.



BACTERIOLOGICAL EXAMINATIONS

From all the snakes which died of mouth-rot, microscopic examination of the mucous membrane showed tiny Gram-negative rods present in it. This bacterium closely resembled *Bacillus typhosus*. Autopsy of the snakes showed these bacilli in all the organs. Culturally examined, they proved to be identical with the bacilli of the mouth. The bacillus is about the size of the bacillus of Typhoid Fever and is present abundantly. It is easily stained with all the aniline dyes but is decolorized in Gram's Stain. The bacillus is very motile and possesses about eight to ten flagella.

Good growth is seen on infusion agar at room temperature and at 37°C. Gelatine is not liquefied nor is Loeffler's serum slant. The hemolysis on blood agar pour plates is gamma. Colonies are fairly large. All cultures give off a very foul odor.

## Cultural Characteristics

Glucose	acid only
Sucrose	negative
Lactose	negative
Xylose	negative
Indol	positive #
Nitrites	positive #
Mannite	acid only
Gelatine	negative
Loeffler's	negative

As soon as it had been established from seventeen cases of mouth-rot in snakes that the same microorganism was repeatedly isolated, the effect of pure cultures on normal snakes and other reptiles and amphibians was tried, in order to see to what degree this bacillus was pathogenic for the latter, and eventually to demonstrate the relation of this bacillus to mouth-rot.

Blacksnakes injected subcutaneously die within one to three days. Up to a very short time before death, the snake gives the impression of normal health. It can be clearly seen that about ten hours before death its movements are no longer as lively as before the injection. Suddenly the reptile becomes nervous, rears up, coils itself wildly around in the cage, and in most cases foams at the mouth. The movements become feebler and the snake dies. The foam contains masses of short Gram-negative rods, which are culturally identical with the bacillus before isolated. Autopsy reveals a hemorrhagic, serous exudate under the skin at the point of injection. The trachea is filled with blood as are also the inner organs. In the lungs, heart, and liver, the Gram-negative rods are found in large numbers.

By rubbing pure cultures in the mouths of Water Snakes (*Matrix sipedon*) which were clinically healthy, it was possible to reproduce the disease. The snakes died within thirty days. On the mucous membrane of the mouth was a caseous mucus.

I am greatly indebted to Dr. Tseo Chih-Chu of the National Medical College of Shanghai, China; Dr. J. Howard Brown, and Mrs. Isabella G. Schaub of Johns Hopkins Medical School for technical

Dear Sir,  
I have the honor to acknowledge the receipt of your letter of the 15th inst. in relation to the above mentioned matter. The same has been referred to the proper authorities for their consideration.

Very truly yours,

J. H. [Name]  
[Address]  
[City, State]

I am, Sir, very respectfully,  
Your obedient servant,  
[Name]

The enclosed copy of the report of the committee on the subject of the proposed amendment to the constitution of the State, is herewith submitted to you for your consideration. It is respectfully suggested that you may wish to refer the same to the proper authorities for their consideration.

I am, Sir, very respectfully,  
Your obedient servant,  
[Name]

assistance, and I am very grateful to Dr. Donald D. Sturgis of Arnold, Maryland, for the use of his snakes. It is my intention to publish in the future a complete report on this subject. The above is a preliminary report.

(1) Zentralblatt für Bakteriologie 77 (1929) J. Burtscher

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### NOTES

#### General Meetings and Lectures of the Society

- December 4 - Talk by Mr. Richard Von Hagel - "Field Work of the Department of Herpetology."  
 December 11 - Talk by Mr. Wilmer Bell - "The Chemistry Phase Rule and Its Application to Industry."  
 December 18 - Lecture by Dr. Howard A. Kelly "An Amateur's Excursions in the Field of Natural History." The lecture was illustrated by specimens, prints, and lantern slides.

#### Lecture to Outside Organization

- December 13 - Lecture to Biology Club of the Baltimore City College by Carroll Wagner. "History of Bacteriology and Bacteriological Technique."

#### Exhibition

- November 12 - December 3 - Exhibit of Taxidermy at the Central Branch of Enoch Pratt Library by Mr. William B. Tyrrell.

#### Junior Meetings

- December 1 - Talks by Donald Roberts - "The Coloration of Leaves", and Dale Doxen - "Chalk."  
 December 15 - Lecture by Richard Webster "A Summer's Work in Entomology."

Gift Collection - On December 1 a collection of forty Maryland minerals was presented to the Department of Geology of Johns Hopkins University.

#### Other Meetings

- December 19 - Special meeting of the Department of Entomology.

#### New York Trip

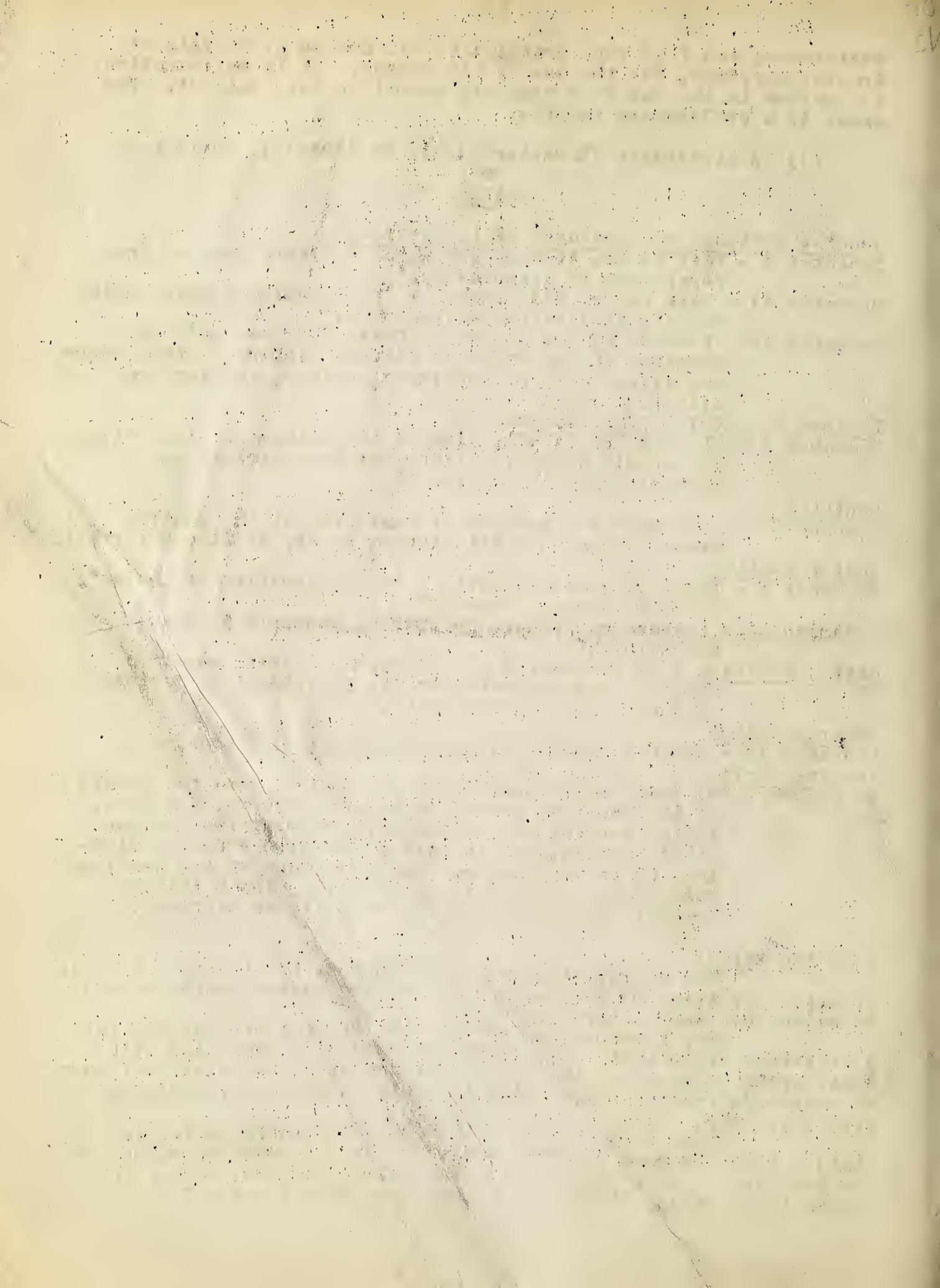
On December 30, twenty-five members of the Society were the guests of the American Museum of Natural History, New York. In the morning the laboratories were visited by the Staff members, and the afternoon was devoted to viewing the Museum proper. Every courtesy of the American Museum was extended to our members. The Baltimore and Ohio Railroad placed a coach at our disposal.

#### Feed the Birds!

The appeal of State Game Warden E. Lee Lecompte to help preserve our birds by feeding them during the winter months should be backed by every nature lover.

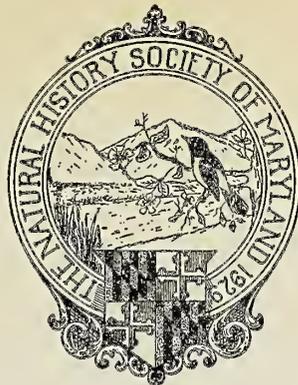
Mr. Lecompte suggests for the feeding of song and insectivorous birds that a wooden tray or vessel of some kind with small grain or suet be placed on the window sill, and also that suet be suspended from a swinging limb in a wire mesh bag or ordinary wire soap tray.

Describing another method of establishing a feeding station (perhaps more for rural sections) Mr. Lecompte says, "One of the best is - corn cobs on which the fodder remains, set up in Indian tepee style leaving the bottom open at all times."

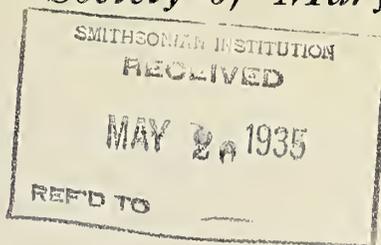


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The Natural History



Society of Maryland



# BULLETIN

Volume V

JANUARY, 1935

Number 5

Herbert C. Moore, Editor

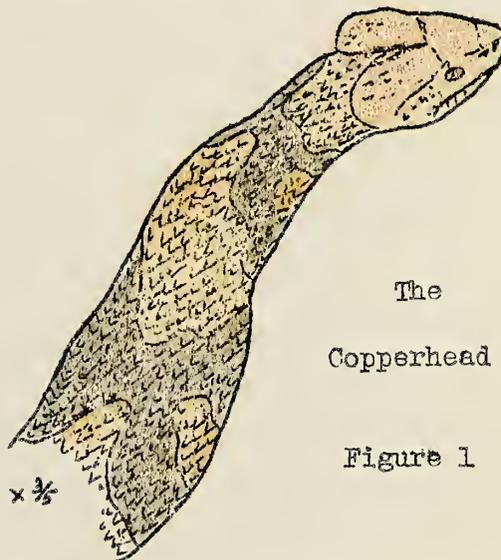
## COLLECTING THE COPPERHEAD

By H. Charles Robertson

It is generally believed that the Copperhead Snake (*Agkistrodon mokasen*) is rare in the State of Maryland, but this belief is not true. However, there are many sections of the State where its occurrence is spotty or where it is not found at all.

One of the best places for observing these reptiles is Allegany County where, high upon the rocky ledges, they are very common. Baltimore, Calvert, Carroll, Frederick, Garrett, and Washington Counties also provide excellent locations to collect and observe these serpents. I have not found them quite so common in Harford, Howard, and St. Mary's Counties.

The coloration of the Copperhead, for that of a dangerously poisonous reptile, is beautiful. Its ground color is pale-brown, pinkish, or sometimes a light reddish brown. A series of dark chocolate-brown blotches cross the body, beginning a short distance from the head and continuing the entire length. There are usually eighteen of the blotches which, when viewed from above, look like hour-glasses in shape, being narrow in the center and becoming wider on the sides. From the side these blotches appear like Y's inverted. The head is a uniform copper color and is not marked except for two tiny black dots. The underside is usually pinkish with a row of dark spots showing on each side.



The  
Copperhead  
Figure 1

New-born Copperheads are gray, and the blotches are either blackish or brownish until about two weeks pass, when they take on the brown shade and the copper color of the head. The tails of the

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young are a brilliant sulphur-yellow, a color that is retained until the serpent is about two years old. This yellow does not always fade entirely away, for many old specimens I have examined still show traces of yellow on the underside.

Some observers claim the yellow tail serves as a decoy in catching small prey that may be interested in a bright yellow grub in the leaves. It is believed young birds and sometimes frogs are attracted by this yellow tail and meet their ultimate end in mistaking the wiggling tail for a grub, while the body of the serpent is hidden under the leaves.

Copperheads are, on an average, about two and one half feet in length. Many examples collected were from thirty-two to thirty-eight inches in length. Occasionally four foot specimens are captured. A three foot Copperhead is a large example.

Several of the harmless serpents are sometimes mistaken for Copperheads and killed. This, no doubt, may be attributed to the fact that many of these other serpents have stout bodies marked with brown or reddish blotches.

The Corn Snake (*Elaphe guttata*) is often mistaken for a Copperhead because of the saddles of reddish brown on its back.

The Hog-nosed Snake (*Heterodon contortrix*) is also confused with the Copperhead. Hog-nosed Snakes have stout bodies and heads that look anything but harmless. (Figure 2)

Once while collecting at a favorite Copperhead den I heard a slight hissing sound near my foot in the underbrush and my first glance showed me what had created the sound. A two foot Hog-nosed Snake was spreading the anterior section of its neck and putting up quite a show.

These serpents (Hog-nosed Snakes) are absolutely harmless and I have never induced one to bite. When surprised or disturbed they are most unusual in their behavior, hissing and spreading the neck somewhat like a Cobra (*Naja*). If the observer continues to disturb the serpent it will roll over on its back as though dead. This is only a sham, for the serpent will crawl away to safety after several minutes have passed. Once while waiting for a Hog-nosed serpent to roll back on its crawling surface I bent over and picked it up, only to hear an exclamation of horror from a friend who had accompanied me on the trip. Having seen several Copperheads at different times he noticed the blotched pattern which led him to believe I had picked up a poisonous serpent.

A valuable point of identification is in the eye of the Copperhead. The pupil of the eye is elliptical. Rattlesnakes also have this type of pupil, which at once suggests nocturnal habits. Most non-venomous serpents have a round pupil.

Last year I began my outdoor observations in April, so as to be on hand when the serpents came out of hibernation. Attention was centered upon a den which had been "worked" several years before and which was known to house a goodly number of Copperheads. In the





Figure 2  
Hog-nosed Snake  
(*Heterodon contortrix*)

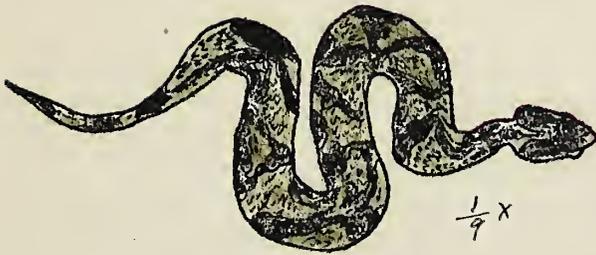


Figure 3  
Copperhead Snake  
(*Agkistrodon mokasen*)

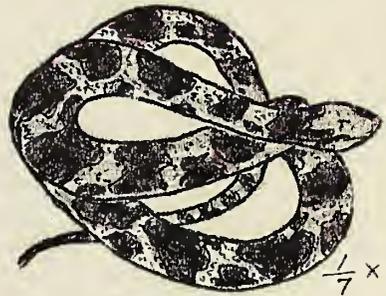
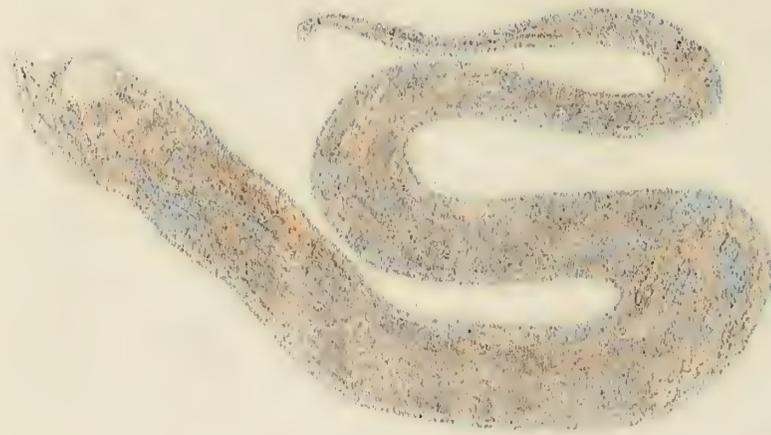
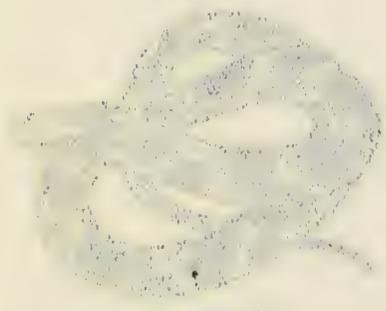


Figure 4  
Milk Snake  
(*Lampropeltis triangulum triangulum*)



2. 1877  
 (1877-1878)  
 (1877-1878)



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 1877  
 (1877-1878)

same den dwelt the Mountain Black Snake (*Elaphe obsoleta obsoleta*), a harmless species that lives in perfect harmony with the venomous serpent. The adults and the young of the Blacksnake live in the den with no apparent respect for the Copperhead, whose bite would be fatal. These Blacksnakes unlike the Black Racer are powerful constrictors and are believed to lead the Copperheads and Rattlesnakes to safety when danger threatens, this being responsible for another local name the "Pilot Blacksnake". The Blacksnakes have no interest in the Copperheads' safety although their living together might have prompted this belief. Blacksnakes of the species mentioned are believed in some localities to be the enemies of the Copperhead and Rattlesnake and it is thought that they kill these dangerous serpents. Those who claim to have witnessed a battle to the death between a Blacksnake and a venomous species have no doubt observed the common King Snake (*Lampropeltis getulus getulus*) in combat, for this species is a cannibalistic serpent, and is immune to the deadly venom of the Copperhead and Rattlesnake. King Snakes kill their prey by constriction. The Copperhead and Rattlesnake lack this power.

The first appearance of a Copperhead at the den was on April 27. The temperature in the den at the time - 11:45 A.M. - was 70°F.

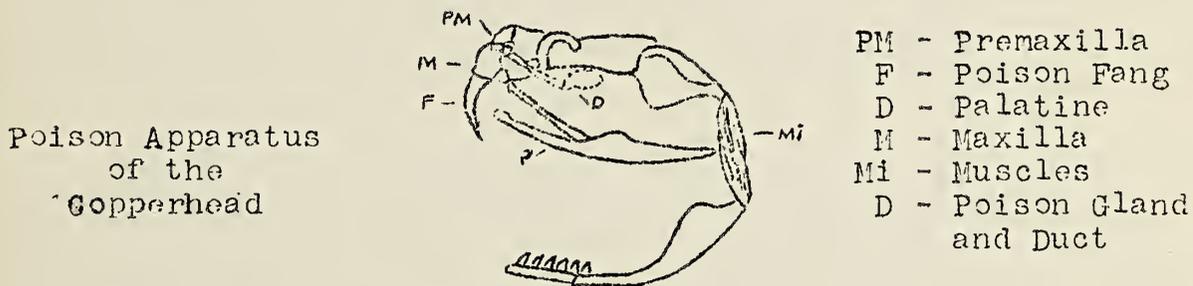


Figure 5

At one o'clock the temperature had risen to 74°F and several other specimens made their appearance. The adults seemed satisfied with lying between the ledges, but a young Copperhead about eighteen inches long crawled out. At three o'clock two other specimens came out upon the rocks and lay in coils where they could receive the full benefit of the life-giving rays of the sun. After sundown they sluggishly crawled back into the den.

The following day found several Copperheads in the same places as before. Basking with them was a three foot Mountain Blacksnake which quickly found its way into my collecting bag. While picking up the Blacksnake my hand came dangerously close to a Copperhead, but the reptile made no attempt to move and showed no signs of excitement.

Knowing the Copperheads to be of nocturnal habits, we took a trip to the locality at night. Two serpents were lying on a flat rock above the den. With the aid of a flashlight we carefully worked our way up to a position where a noose could be placed over their heads. With more than fifty feet of jagged rock below us our danger lay in being bitten by a Copperhead or in falling. My assistant held the light and guided the noose, the other end of which I was holding. At the proper time the wire was pulled, making



the serpent ours. The second Copperhead crawled out of reach.

Repeated trips were made to the den at night and on almost every trip we brought back a Copperhead. The hour between eleven and twelve seemed to be the best time. Trips made at an earlier hour found the serpents too far down among the rocks so that observation was difficult.

Further investigations made later in the season proved that the Copperheads came down from the ledges to the swamp area below. The serpents could be found bordering the swamp. Apparently they spent the entire season in the lowlands where there was an abundance of food. Many small rodents inhabited these lowlands, supplying the serpents with an ideal hunting ground.

This location just mentioned, Patapsco State Park, is being reforested by workers of the Civilian Conservation Corps. In the swamp area members of this Corps killed thirty Copperheads in one day. Several more seasons such as this will no doubt destroy all Copperheads in this section, as well as the valuable serpents. At this present rate reptile life in Orange Grove, Vineyard, and Glenartney will be exterminated in a short time. The Copperhead is the only poisonous serpent found there, although sixteen harmless species have been collected, proving that the territory was an ideal one for the study of reptiles. At Glenartney the Copperhead has been abundant in the heavily wooded hills. A specimen captured there two years ago measured four feet.

In August a large female was captured in the Glenartney district. On the eighteenth of September she gave birth to twelve young. The majority of these babies were six inches in length, the remainder between four and five inches. They were provided at birth with fangs and well developed poison apparatus. A bite from a baby Copperhead would be dangerous and could possibly cause death.

The color of these babies was a decided gray and the markings were blackish. All had sulphur-yellow tails. After eight days they were rapidly turning to the brown color and the heads were becoming a distinct copper color. Two tiny black dots were on the top of each head. By December they had grown from three to five inches and several were eleven inches long. They took small frogs (*Hyla crucifer*), until winter cut off this supply. Then they were successfully force-fed with a pipette full of well-beaten eggs and tiny bits of raw beef.

So perfect is the protective coloration of the Copperhead it can lie unnoticed among dry leaves when only a few feet away, and as a rule, it is better behaved than it is usually given credit for. On several occasions I have been very close to one of these snakes without knowing it, and still it did not bite. Being a sluggish serpent it prefers to lie perfectly still when an intruder comes along and never dashes away like most serpents. Seldom will it strike or bite unless stepped upon or otherwise disturbed. But if it is stepped upon or cornered it will strike with the speed of an arrow. Should one place a stick across the body of a Copperhead, holding it down, it will turn and bite the stick viciously. Sometimes in excitement it will bite its own body with no ill effects, for it is immune to its own and other Copperheads' venom.

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A Copperhead will inject approximately forty milligrams in one bite, according to the size and condition of the serpent. One drop of this venom properly injected could cause the death of a man. However, fatal accidents from this serpent are rare.

It is unwise to try to handle captive Copperheads with the belief that they will become tame. Captive specimens may become very sluggish in their actions and appear docile but when picked up usually turn and bite. They do not have to be coiled to bite.

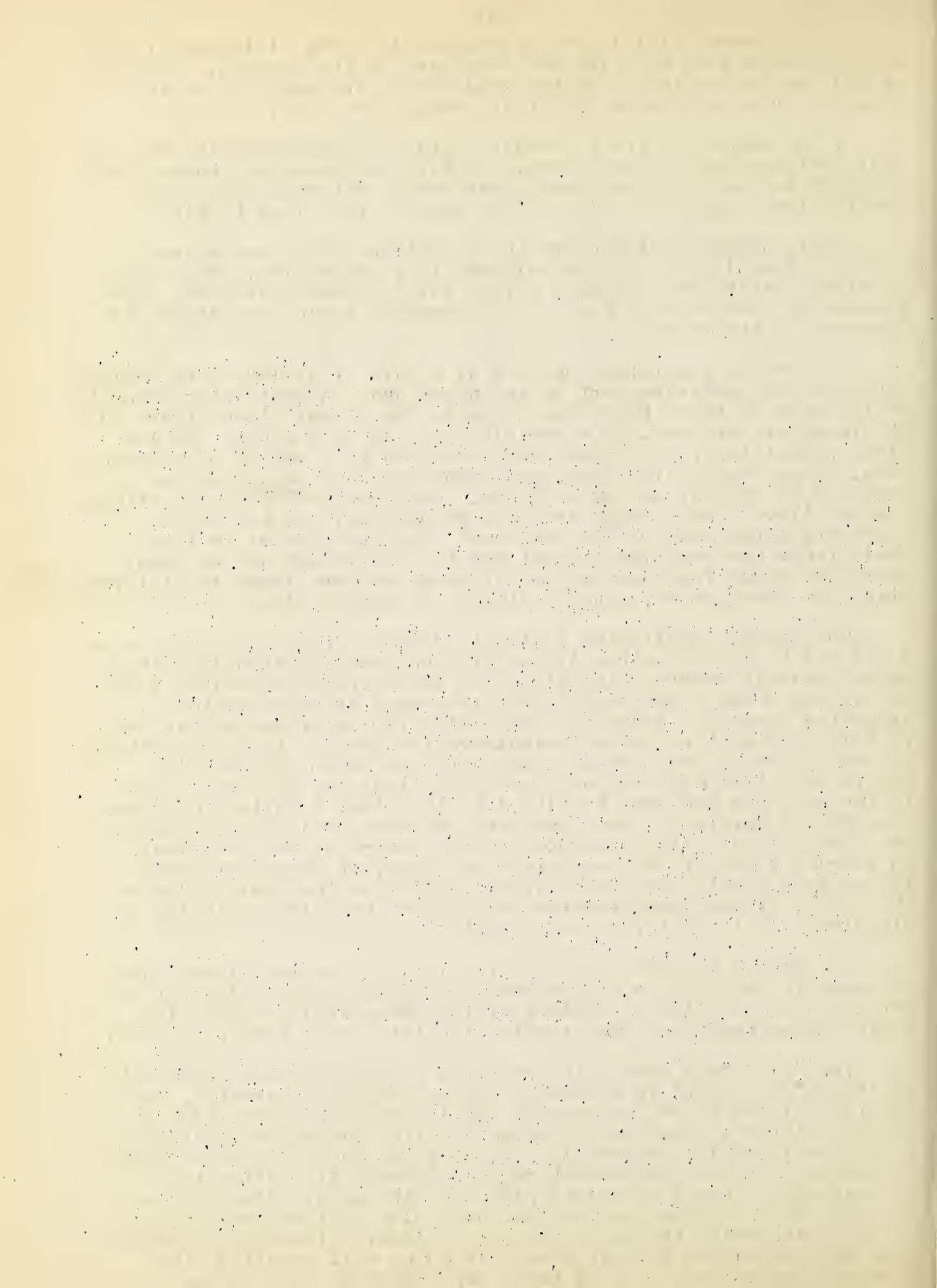
Small animals poisoned by the injection of the venom are affected immediately and are helpless in a short time. The prey is always bitten and poisoned before being consumed as food. Not possessing constricting power the Copperhead would soon starve if deprived of its venom.

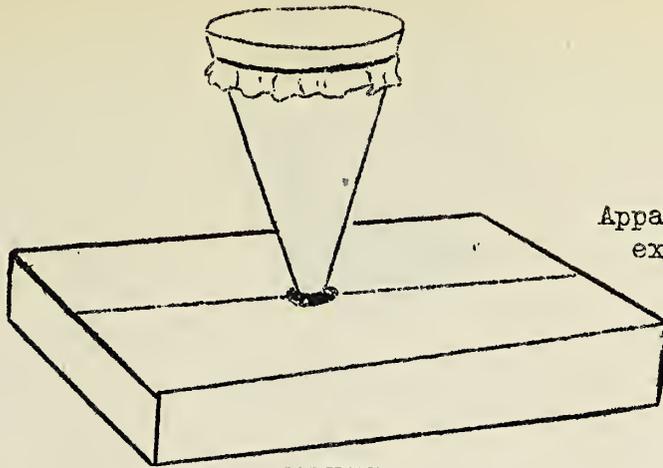
The poison apparatus consists of a pair of hollow teeth, called fangs, in the anterior part of the upper jaw. A duct which connects at the base of these fangs runs back to the gland. (See Figure 5). The fangs are attached to a movable bone and when not in use lie flat against the roof of the mouth, covered by a sheath of whitish skin. Copperheads like other poisonous serpents cannot be made harmless by pulling out these fangs. New ones grow in place within a short time. These fangs are shed frequently, the new fangs appearing along side of the old ones. Specimens about to lose their fangs are sometimes caught and the dual fangs may be seen. There are about fourteen or more of these reserve fangs in different stages of development, equally divided on either side.

The venom, a yellowish fluid, is derived from an almond-shaped gland which lies above the lip margin and when injected into an animal quickly destroys the blood and the carrying vessels. Venom is carried through the system from the wound by means of the lymphatic vessels. Venom when extracted for experimental use can be dried and kept in sealed containers for years. (An illustration of the apparatus used for the extraction of venom is shown in Figure 6). Poisonous serpents are held firmly by the neck close to the head and are made to bite into the cloth covering the glass cone-shaped container. Two tiny jets of venom, which are produced when the serpent bites, run down to the bottom of the container. In storing venom, if the container be glass, it should be protected from light, for light rapidly decreases the toxic value of the venom. Venom thus preserved can be put back into solution by dissolving it in a sterile salt solution.

Dr. Howard A. Kelly has what I believe to be the oldest tube of venom in the world - a tube nearly a hundred years old. It is not known at the time of writing if the venom still retains its toxic properties as no experiments with this venom have been made.

The "pit" from whence the serpents possessing this organ get the term "pit viper" is a sensory organ. Highly innervated, the pit is believed to be responsible for the accuracy with which the serpents strike. Experiments show that if a pit viper is blinded it can still strike accurately. Knowing the tongue to be a highly developed organ the experimenters also removed it. Still the serpent could strike an animal placed in its cage. Finally when the pits were removed, the serpent made slow strikes sweeping to one side as though trying to find the animal. Microscopic examination of sections of the pit showed it to be well supplied with nerves. The animals used by these experimenters were rats.





Apparatus used for the  
extraction of venom

Figure 6

### NOTES

#### Meetings of the Society

- January 8 - Talk by Mr. Elra M. Palmer - "Benefits Derived from the Natural History Society of Maryland."  
 January 15 - Talk by Mr. Edmund B. Fladung - "Development of the Natural History Society of Maryland."  
 January 22 - Talk by Mr. John B. Calder - "Barnacles."  
 January 29 - Talk by Mr. H. C. Robertson - "Treatment of Snake Bites."

#### Junior Meetings

- January 5 - General meeting and discussions.  
 January 19 - Lecture by Dr. Joseph L. Wheeler - "Museums, Collections, and Books as an aid to Amateur Scientists."

#### Trustees Meetings

- January 4 - Quarterly business meeting of the Society.  
 Committees appointed:- Nominating for two Trustees; G. C. Klingel, Chairman, Edward McColgan and Herbert C. Moore. Budget Committee: Elra M. Palmer, Chairman, John B. Calder, Gilbert C. Klingel, and Edmund B. Fladung, Ex Officio.

- January 12 - Special Meeting in connection with securing new building.

#### Departmental Meetings

- January 12 - Mineralogy.  
 January 9 - Entomology.

#### Lectures to Outside Organizations

- January 3 - To Troop 178, B.S.A. by Mr. H. C. Robertson - "Snakes of Maryland."  
 January 14 - To State Normal School by Mr. Earl H. Palmer - "Botany."  
 January 14 - To School #1 by Mr. Richard Webster - "Insect Life."  
 January 16 - To School #1 by Mr. L. Bryant Mather - "Rocks."  
 January 17 - To the Gilman Country School by Prof. John A. Frisch, S.J. "Ants and Their Ways."  
 January 23 - To the State Normal School by Prof. John A. Frisch, S.J. - "Ants and Their Ways."  
 January 18 - Talk over Station WFBR - School News Broadcast.  
 Resume of the talks of R. Webster and L. Bryant Mather at School #1.

#### Exhibitions, Gifts, and Loans

- January 12 - Exhibit of Rocks and Minerals at Branch No. 12, Enoch Pratt Library.  
 January 10 - Loan collection of rocks to Towson High School.  
 January 31 - Acknowledgment by National Museum of a gift of three mineral specimens - two of sepiolite from Bare Hills, and one of Deweylite from Soldiers Delight, Maryland.

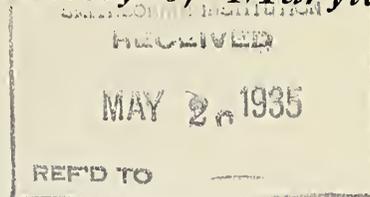


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*The Natural History*



*Society of Maryland*



## BULLETIN

Volume V

FEBRUARY, 1935  
Herbert C. Moore, Editor

Number 6

### THE SOCIETY'S NEW QUARTERS

By  
Edmund B. Fladung

Six years ago when the Founders of this Society drew up their Charter and Constitution they were imbued with the idea of having more than an ordinary Society of kindred spirits, an institution which would not only be engaged in research work, but one that would render services to the citizens of Maryland and especially of Baltimore. Article 3 of Section A of our Charter, and Article 2 of our Constitution read:-

"The object of the Corporation shall be to increase and diffuse knowledge of Natural History and to this end establish and maintain in the State of Maryland a museum and reference library, to collect and preserve objects of Natural History, to protect wild life from needless destruction, to provide facilities for research and publication, and for the pursuance of allied sciences and endeavors, and to offer popular instruction."

For the past six years the Society has been working to these ends. Many of these objects we have been able to fulfill beyond our original expectations. One dream is now being materialized - that is, to possess a building large enough where we can place on public exhibition the vast amount of material we have been collecting so that the results of our work will be at the disposal of those interested in diffusing the knowledge of Natural History.

We now have such a building. Though small, it furnishes room to expand and provides more and better facilities for research, -to render to teachers, students and pupils of our schools more service than heretofore.

At the commencement of this fiscal year we had no idea that we would be forced to expand so soon, although it would have been inevitable. However, the demands that have been made upon us during this year for services to schools, libraries, clubs, etc., have hastened this step.

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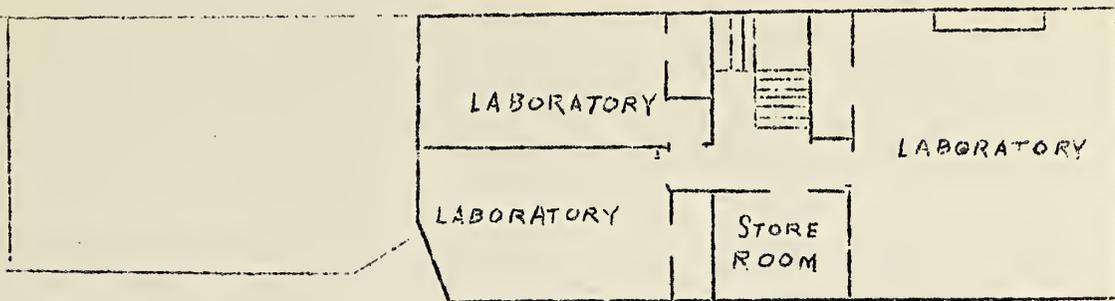
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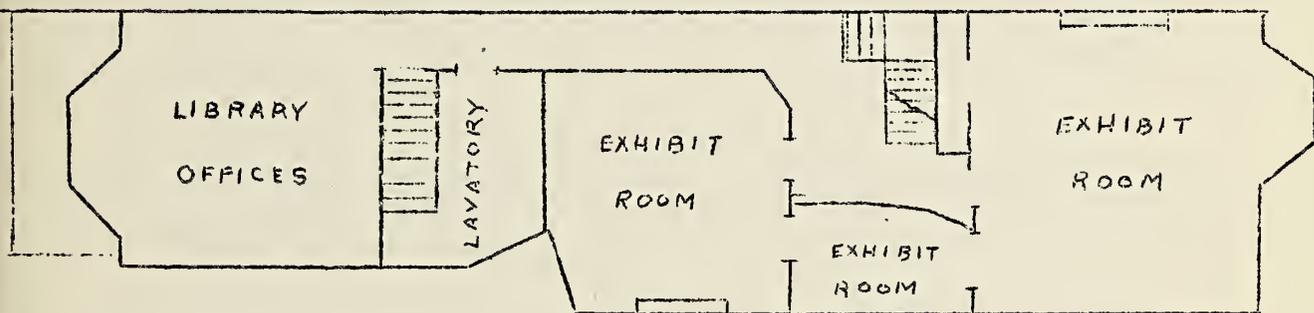
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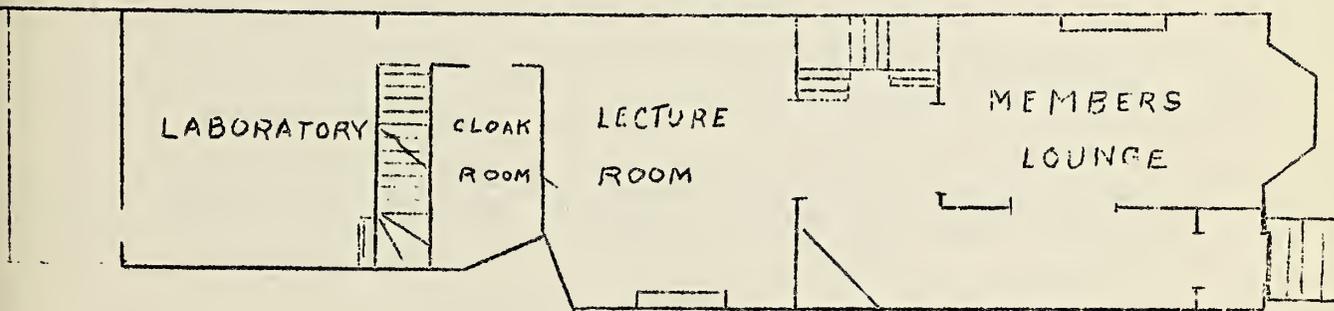
# FLOOR PLAN OF SOCIETY'S NEW HOME



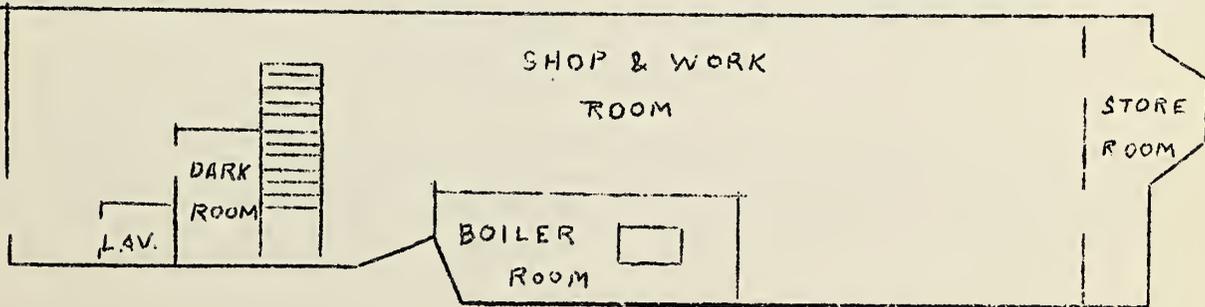
THIRD FLOOR



SECOND FLOOR



FIRST FLOOR



CELLAR



The Society's new quarters are at 2103 N. Bolton Street. A plan of the building accompanies this article and will give the reader an idea of the extent of our expansion. This will especially interest those who have been acquainted with the Society's quarters of the past six years.

We now have 3700 square feet of floor space whereas we only had 400 feet heretofore. Our lecture service at the Society had to be curtailed owing to our limited space. With our enlarged quarters we can accommodate more persons, our lecture room being so located that the hall and members' lounge will take care of an excess audience.

The library has now plenty of room for expansion. Also there is office space for the officers where they may perform their duties.

We have sufficient room to exhibit many of our specimens which have been housed in the homes of our members. The rooms are so located that visitors will have a clear passageway to them. Moreover, the members' lounge and hallways can be used if more exhibition space is needed.

But the most needed space of all is for laboratories and work-rooms. For these, the third floor and cellar lend themselves admirably. Each department will have working space as well as space for storage of its collections.

A part of the cellar will be quite appropriate for a dark room in which to make lantern slides, etc., and a shop for building cases and other necessary adjuncts.

Besides these added facilities the members will have a commodious room in which to lounge and chat, and also a suitable room for hats and coats.

We trust with the above acquisitions the Society will be able to hasten much of its work and facilitate the many other projects it is contemplating.

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Relative Frequencies of the Pulsations of the Anterior and Posterior  
Contractile Vacuoles in *Paramecium multimicronucleatum* and *Paramecium*  
*caudatum*  
Preliminary Report

Fortner (1924) reports that the posterior contractile vacuole pulsates more rapidly than the anterior in *Paramecium caudatum*. Child and Deviney (1926), Eisenberg (1926) and Port (1927) report that the anterior vacuole pulsates more rapidly. The latter is in accord with Child's axial gradient theory.

Fifty-one individuals of *Paramecium multimicronucleatum* were studied by timing the pulsations of the anterior and posterior contractile vacuole simultaneously, for as many successive pulsations as possible. In only 6 individuals with a total of 122 pulsations did the anterior vacuole pulsate more rapidly. In the remaining 45 individuals, with a total of 1132 pulsations, the



posterior vacuole pulsated more rapidly by from .03 to 3.16 seconds.

Early results of studying *Paramecium caudatum* by the same method indicate that the posterior vacuole pulsates more rapidly also in this species. A complete report of both these studies will be published later.

#### References

1924 - Fortner, H. Uber die physiologisch differente Bedeutung der kontraktilen Vakuolen bei *Paramecium caudatum*, Ehrbg.: Zool. Anz., 60:217.

1926 - Child, C.M. and Deviney, E. Contributions to the physiology of *Paramecium caudatum*. Jour. Exp. Zool. :43, 257-312.

1926 - Eisenberg, E. Recherches sur le fonctionnement de la vesicule pulsatile des infusoires, (Par. caud. Stein), dans les conditions normales et sous l'action des certains agents experimentaux; pression osmotique et electrolytes. Arch. Biol. Liege-Paris; 35: 441-464.

1927 - Port, J. Beitrag zur Temperaturwirkung auf die Pulsation der Vakuolen bei *P. caud.* Protoplasma; 1(4), 566-580.

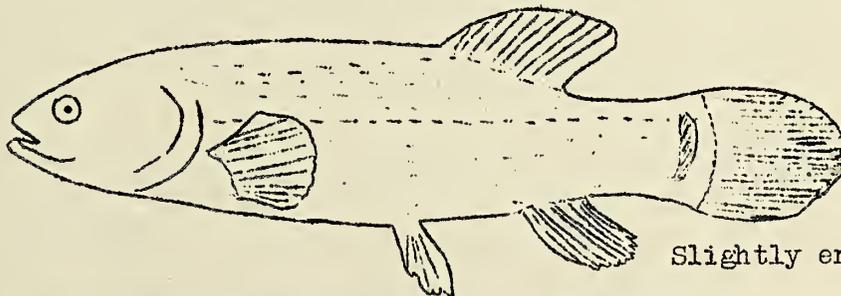
John A. Frisch, S.J.

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#### ONE OF THE ORDER HAPLOMI

By Frank C. Yingling

In the lowland pools and swamps there is a small sluggish, carnivorous fish, *Umbra pygmaea*, the Eastern Minnow, which is closely related to the pike family and belongs to the family of Umbridae or Mud Minnows.



Slightly enlarged

*Umbra pygmaea* (The Eastern Mud Minnow)

Due to the draining of the swamps at Vineyard in Baltimore County these fish were abundant in the stagnant water of the small pools. Over fifty specimens were collected, examined, and later released in streams in the vicinity. The fish ranged in size from 40 mm. to 85 mm. The smaller fish were of a light brown, the larger an olive green with about twelve longitudinal pale stripes.

From the specimens examined it appears that the spawning of



this fish is most likely in late March and early April. A ripe female 76 mm. in length was taken in March. Later this specimen spawned approximately 1200 eggs of a milky white each about 1 mm. in diameter. This female was a very dark green and the stripes very distinct and dark. After spawning the stripes faded and the color changed to the usual olive green.

Whether this fish is a nest builder or not, little is known. According to the observations of one aquarist who kept a pair in a tank, the male hollows a nest in the algae where the female spawns.

This fish I find to be abundant in certain localities, principally in swamps where there is a heavier vegetation than in rivers or streams. They have been observed at Conowingo in the pools below the dam and especially at Vineyard.

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### NOTES

#### General Meetings and Lectures of the Society

February 5 - Talk by Mr. Milton Oler, Jr. - "A Description of Ancient Dinosaurs." Illustrated with plaster casts of original models by Mr. Oler. (Made to scale).

February 12 - Talk by Mr. Francis O'Rourke - "Plant Nomenclature."

February 19 - Lecture by Dr. William S. Pike "Crater Lake, Grasshopper Glacier, and Heat Activity of Yellowstone Park." The lecture was illustrated with colored motion pictures.

February 26 - Talk by Mr. Woodward Burkhart - "Three Important Indian Village Sites of Maryland." Illustrated with Indian artifacts.

#### Special Lecture

February 15 - The first of a series of illustrated lectures for the general public was given at the Central Branch of the Enoch Pratt Library by Mr. Gilbert C. Klingel. This lecture was entitled - "Exploring the Bottom of the Chesapeake."

#### Lecture to Outside Organization

February 21 - Lecture entitled - "Insect Life" to the Science Faculty and Science Club of the Clifton Park Junior High School by Mr. Richard Webster. Illustrated with specimens.

#### Exhibition

February 15 - Exhibit of Minerals at the fifth anniversary celebration of Boy Scout Troop #175.

#### Junior Meetings

February 2 - Talk by Mr. Ned Crosby - "The Use of Specific Gravity and Magnetism in Determining Minerals."

February 16 - Lecture by Mr. H. Charles Robertson - "Snakes of the World." Illustrated.

#### Other Meetings

February 9 - Special meeting of Board of Trustees.

February 23 - Special meeting of Curators.



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*The Natural History*



*Society of Maryland*



**BULLETIN**

Volume V

MARCH, 1935

Number 7

Herbert C. Moore, Editor

BIRD NOTES FROM HONGA, MARYLAND

By W. Bryant Tyrrell

In the fall of 1933 I spent three weeks, from September 23 to October 15, at Honga, Hoopers Island, Maryland. During this interval most of my time was taken up by my work and therefore my attention to the bird life of the island was limited. However, when the work was nearing completion I was able to take several short trips to nearby localities. Notes were made whenever possible, but they are not complete.

Honga is a small village on the northern or upper end of the most northernly island of the group of three Hooper's Islands, located on the eastern shore of Chesapeake Bay, in Dorchester County, in the southern part of the eastern shore of Maryland.

Hooper's Islands, as well as some of the other islands of the eastern shore of the Chesapeake Bay have long been known as a fall migration route for hawks and other birds and during the late fall, winter, and early spring the waters, which abound with natural food, are visited by thousands of ducks, geese, and swans. The islands, which are bounded on the east by the Honga River, and on the west by Chesapeake Bay (except at the northern part, where they are separated from the Bay by Tar Bay and Barron Island) are a group of three long, narrow, low-lying islands, extending in a northwest, south-easterly direction, the highest point of which does not exceed twenty feet above the water. A large part of the margins of the islands are swampy, though there are stretches of gravel and in some places sandy beaches. There are some wooded areas, but the greater part of the land is clear and is used as pasture, or is occasionally farmed, although most of the inhabitants make their living from the water--fish, crabs, oysters.

The localities visited included a number of different types of country, all typical of the region. On the way to, and only a few miles distant from Honga, the Blackwater marsh, a federal game preserve, was crossed, though unfortunately but little time was



spent there. On the afternoon of Sunday, October 8, a walk was taken through the evergreens to a wide, marshy area to the south and east along the Honga River. On October 9, a short time was spent in the late afternoon on an area known locally as "the Great Marsh", in the hope of finding some shore birds which were said to abound there. This area, which is on Chesapeake Bay, has a sandy beach, back of which are alternately marshy areas and open water. The Bay was crossed twice in a fishing boat to Cedar Point; once in beautiful weather and the second time on a cold, dull, rainy day with frequent short squalls. At Cedar Point there is a wide, sandy beach backed by a low growth of trees and there the most conspicuous bird was the eagle. The last trip was taken to a mixed wood of virgin timber near Golden Hill, where the peculiar gray form of the fox squirrel is found. There we found some of the forest-loving birds which were not seen elsewhere.

On several days there were distinct migrations. On October 4 and 9 there was a heavy hawk migration. One could see them in the air most of the time and literally thousands were killed for food, for the people of the island would rather eat hawk than chicken. On the night of October 12, which was clear and cool, with a bright moon, there was a migration of small birds, with Warblers in abundance, and on the morning of the 13th the yard was full of small birds. At about the time I was leaving, the duck and geese migration was just starting, the first few flocks being seen.

The following is the list of birds observed:

Loon--*Gavia i. immer*--On September 28 one was seen flying over Tar Bay; on the 29th five more were seen; on October 12, when crossing to Cedar Point, several were seen in Chesapeake Bay; and on October 13 many were seen.

Double-crested Cormorant--*Phalacrocorax a. auritus*--on October 13 one was seen on a pond net stake near Cedar Point.

Great Blue Heron --*Ardea h. herodias*--a common bird around the marshes.

Canada Geese--*Branta c. canadensis*--on October 13 one flock was seen, the first of the season.

Black Duck--*Anas rubripes tristis*--on September 22, two were seen over the Blackwater marsh and on October 9 seven were seen on the "Great Marsh".

Pintail--*Dafila acuta tzitzihoa*--Captain Sam Tolley reported seeing two over the Bay on his trip to Cedar Point on September 29, and on the 14th of October reported several flocks.

Ducks and Geese are birds over which there is considerable controversy on the Eastern Shore of Maryland. The local hunters claim that all the good shooting grounds have been bought by wealthy interests and it leaves no place for the little fellow to hunt. But they will hunt - so most of their hunting is done illegally at night, with a light. Several experiences were related to me, one of which



I shall repeat. Two men had been baiting a certain bar for some time, watching it to see when the geese were numerous. One dark night the two of them started out in a fast power boat - faster than the game warden's. As they came near the bar they could hear the geese, so they got into a skiff and rowed slowly in the direction of the birds. When they were close they turned on a powerful light with which they saw a group of birds, thirty or forty feet in front of them. One barrel of a heavily loaded 8-gauge gun was fired into the flock. With the report the entire flock, possibly several hundred birds, rose. When the birds were gone the two men picked up seventeen dead birds, making no attempt to chase the cripples. Upon arriving home they picked the birds, packed them in ice, and kept them until they were wanted. Ducks are taken in the same way, and I was told that as many as two hundred had been killed with one shot.

Turkey Vulture - *Cathartes aura septentrionalis* - one of the commonest birds.

Sharp-shinned Hawk - *Accipiter v. velox* - on September 30 one was collected; two were seen on October 1, flying just over the tops of the bushes; on October 4 and 9 many were seen, all flying low.

Cooper's Hawk - *Accipiter cooperi* - an immature female was collected on September 30, and many were seen on October 4 and 9, flying quite high.

Northern Red-shouldered Hawk - *Buteo l. lineatus* - an immature bird was collected by H. Hall, on October 11.

Broad-winged Hawk - *Buteo p. platypterus* - a few were seen on October 4 and 9.

American Rough-legged Hawk - *Buteo lagopus s. johannis* - one was seen near Golden Hill on October 13.

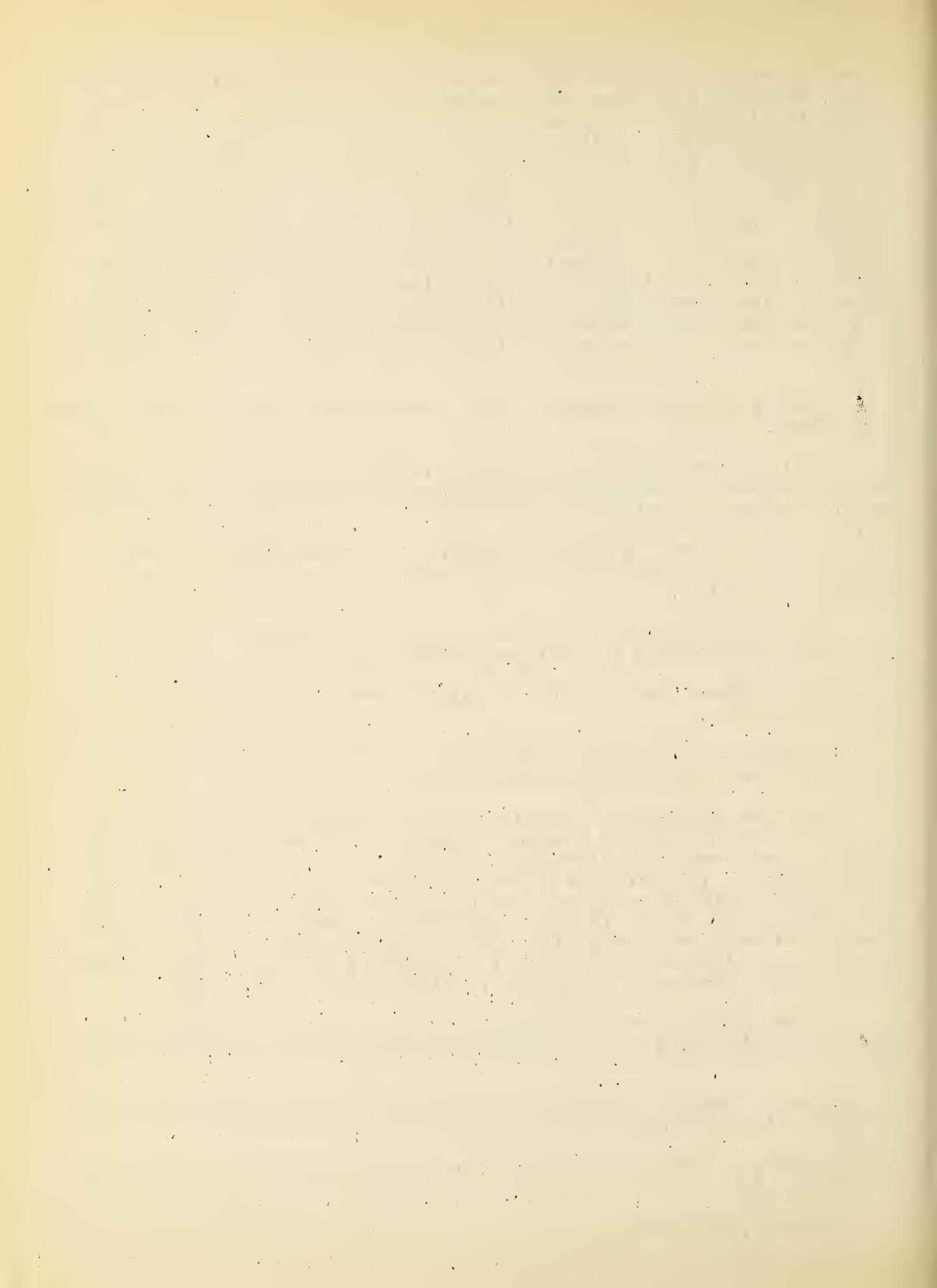
Southern Bald Eagle - *Haliaeetus l. leucocephalus* - at Cedar Point on both October 12 and 13, a number of these birds were seen; at one time four old white-headed birds and six or seven immature were in view. The principal food of eagles is fish, and when the unmarketable fish were thrown overboard, the eagles were not long in coming after them. It was interesting to watch the gulls, which always followed the boat, give way as an eagle approached. They seemed to just spread out and let the eagle take its pick, and when he had gone, back they would come, until another eagle appeared.

Marsh Hawk - *Circus hudsonius* - one was seen over Blackwater Marsh on September 22, and another was seen near the house on October 9.

Osprey - *Pandion haliaetus carolinensis* - several were noted at Cedar Point on October 12 and 13.

Duck Hawk - *Falco peregrinus* - one was seen over the Great Marsh on October 9.

Eastern Pigeon Hawk - *Falco c. columbarius* - reported to be quite



plentiful during the fall migration, though I did not see any. H. Hall collected one on September 23, and also has a mounted one in his collection.

Eastern Sparrow Hawk - *Falco s. sperverius* - an adult male collected on October 2.

During the fall migration there is a heavy flight of hawks. The birds follow the land along the eastern shore of the Chesapeake Bay, usually flying with a northwest wind. At times hundreds are in sight. Elmer Hall and his son Harold, residents of the Island, have a collection of mounted birds which contains the following, all taken on Hoopers Island:- Goshawk, Sharp-shinned Hawk, Cooper's Hawk, Red-tailed Hawk, Red-shouldered Hawk, Broadwing Hawk, Rough-legged Hawk, Bald Eagle, Marsh Hawk, Osprey, Duck Hawk, Pigeon Hawk, Sparrow Hawk.

Coot - *Fulica a. americana* - two small flocks of five or six were seen on October 12; one was collected October 13; reported to be exceedingly abundant a little later.

Killdeer - *Oxyechus v. vociferus* - quite common, often heard during the day flying high. Twice heard at night, on the 28th and 29th of September.

American Woodcock - *Philohela minor* - one collected on October 4, but shot too badly to save.

Spotted Sandpiper - *Actitis macularia* - one seen at Cedar Point on October 13.

Least Sandpiper - *Pisobia minutilla* - two in a flock of Sanderlings at Cedar Point on October 12.

Sanderling - *Crocethia alba* - three collected from a flock at Cedar Point, October 12.

Herring Gull - *Larus argentatus smithsonianus* - common.

Ring-billed Gull - *Larus delawarensis* - common, but not as abundant as the former species; one collected.

Laughing Gull - *Larus atricilla* - common, several collected.

Common Tern - *Sterna h. hirundo* - several seen on September 28; one collected on the 29th.

Eastern Whip-poor-will - *Antrostomus v. vociferus* - one collected on October 3.

Eastern Kingfisher - *Megaceryle a. alcyon* - an immature female collected on September 29; one seen at Cedar Point.

Northern Flicker - *Colaptes auratus luteus* - Flickers or "Hanners" as they are locally called, are considered quite a delicacy and are hunted each fall on their southern migration.

It was interesting to hear the men talk of them.



Hanner Poles - tall straight poles are erected in suitable locations, usually near the house or in a clearing near the house, and early in the morning the men sit under these poles until a number of birds "pitch" up on them and then they fire, often getting four, five or even more with one shot. On September 29, there was a northwest wind and the birds came down with that wind. They were surely abundant; one could see them everywhere. The 30th, Saturday, was a beautiful, clear, calm day with nothing much for the men to do, so they all went out to shoot birds. Some hawks were killed, but the hanners suffered most. A thousand birds must have been killed on that day; two men shot sixty-six, another forty-eight, another twenty-five, another nine, and so on over the entire island.

Yellow-bellied Sapsucker - *Sphyrapicus v. varius* - one seen on October 4.

Eastern Phoebe - *Sayornis phoebe* - on September 28 one was seen near the house; and another at Cedar Point on October 12.

Tree Swallow - *Iridoprocne bicolor* - several flocks flying over on October 8.

Northern Blue Jay - *Cyanocitta c. cristata* - one was heard near Golden Hill on October 13, though H. Hall reported it quite common at times.

Eastern Crow - *Corvus b. brachyrhynchos* - a common bird at all times.

Fish Crow - *Corvus ossifragus* - not as abundant as the former species.

Tufted Titmouse - *Baeolophus bicolor* - one seen near Golden Hill, October 13.

Red-breasted Nuthatch - *Sitta canadensis* - one seen in the yard on October 8; and again at Cedar Point on October 12.

Carolina Wren - *Thryothorus l. ludovicianus* - on October 8 one was seen; and again on the 12th at Cedar Point.

Mocking Bird - *Mimus p. polyglottos* - one collected October 11.

Brown Thrasher - *Toxostoma rufum* - one was seen in the fig tree in back of the house September 20, October 3, 4, and 8.

Eastern Robin - *Turdus m. migratorius* - one heard singing a feeble song on October 8; noted again on the 12th and 14th.

Eastern Hermit Thrush - *Hylocichla guttata faxoni* - one collected on October 13.

Eastern Bluebird - *Sialia s. sialia* - a few were seen on October 11; also at Cedar Point on the 12th; and on the 14th near Golden Hill they were quite abundant.

Eastern Golden-crowned Kinglet - *Regulus s. satrapa* - one in the yard the morning of October 12; and several were seen near Golden Hill on the 14th.



Eastern-Ruby-crowned Kinglet - *Corthylio c. calendula* - one seen at Cedar Point on the 12th of October; on the 13th a boy brought one to me which he had killed with a stone.

Starling - *Sturnus v. vulgaris* - abundant; and, as elsewhere, a pest. In former years a good crop of figs were usually harvested, now the starlings eat them as fast as they ripen.

Cape May Warbler - *Dendroica tigrina* - on October 13 one was seen in the yard. Hundreds of warblers arrived the night of October 12 and on the morning of the 13th the low trees and bushes were full of them, but I was not able to take time to identify them.

Myrtle Warbler - *Dendroica coronata* - one seen on October 3.

Meadlowlark - *Sturnella m. magna* - one or two were seen or heard nearly every day.

Eastern Red-winged Blackbird - *Agelaius p. phoeniceus* - usually to be seen over the marshy areas, though no large flocks were noted.

Purple Grackle - *Quiscalus q. quiscula* - a few seen on October 13.

Eastern Goldfinch - *Spinus t. tristis* - a few seen every day or two.

Red-eyed Towhee - *Pipilo e. erythrophthalmus* - several seen on October 3 and again on the 8th; a pair collected on October 14.

Slate-colored Junco - *Junco h. hyemalis* - two were seen on October 3 and by the 14th they were an abundant bird.

Eastern Song Sparrow - *Melospiza m. melodia* - first noted on October 3; seen often after that; one making a poor attempt to sing on October 9.

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#### NOTES

Meetings and Lectures at the Society - March 5 - Talk by Mr. Joseph White - "Fish of the Family Cyprinodontidae." March 12 - Talk by Mr. Elmo Masters - "Building a Nature Trail." March 19 - Talk by Mr. Charles Svec - "Soil as a Factor in Plant Growth." March 26 - Annual Meeting of the Society. The President delivered his annual address on the growth and progress of the Society during the past fiscal year. Reports were submitted by the Secretary, Treasurer, the Curators of the various Scientific Departments, the Editor of the Department of Publication, the Director of the Department of Education, and the Librarian.

Lectures to Outside Organizations - March 15 - The second of the first series of lectures to the public at large was held in the Auditorium of the Central Branch of the Enoch Pratt Library. Rev. John A. Frisch, S.J. delivered the lecture, the subject of which was "Ants and Their Ways." March 27 - Lecture entitled "Snakes of Maryland" to the Clifton Park High School by Mr. Elra M. Palmer. March 27 - Two lectures entitled "Snakes of Maryland" were given to two Science Classes of the Public Evening High School by Mr. Elra M. Palmer.

Exhibitions - March 29 - A fourteen day exhibit of minerals, plants, and insects was installed in School No. 1.

Junior Division - March 1 - Talks by Robert Wheeler "Rock Formation in the Baltimore Area" and Elias Cohen, "The Life History of the Garter Snake." March 16 - Lecture by Mr. Frank Yingling "Fishes of Maryland."



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*The Natural History*



*Society of Maryland*

**BULLETIN**



Vol. V No. 8

APRIL, 1935

\$1.00 a Year

**ZEOLITES OF THE GABBRO OF BALTIMORE CITY**

By Walter E. Price, Jr.

The zeolites are a group of well defined hydrous silicates closely allied chemically with the feldspars, but different from them in that they contain water of crystallization. They are characterized by a moderate hardness of from 3 to 5.5, a low specific gravity of from 2 to 2.5, and are easily fusible with intumescence at from 2 to 3. The name zeolite, from the Greek meaning boiling stone, describes appropriately their peculiar action before the blowpipe. Acids easily decompose them with the separation of silica in either a powdery or gelatinous form. Optically they all possess a low index of refraction and weak birefringence. Most commonly they occur white; they are rarely colored. The zeolites are secondary minerals found in cavities in the basic igneous rocks such as basalt, diabase, gabbro, etc. The most noted localities for zeolites in the United States are Table Mt. at Golden, Colorado, and in New Jersey at Bergen Hill, and West Paterson.

The gabbro of Baltimore County is a medium to coarse grained, granular, completely crystalline rock of a black to dark green color. It is composed of pyroxene and dark plagioclase feldspar. The greater parts of the north and northwestern sections of Baltimore City are covered by this rock. There are several good exposures in various quarries and stream valleys in the city.

The most abundant zeolite occurring in the Baltimore area of gabbro, or "trap" as it is commonly called, is laumontite  $CaAl_2Si_4O_{12} \cdot 4H_2O$ . It is found in greatest abundance at the Woodberry Trap Rock Quarry. There it occurs along all the joints in the rock, and frequently it is found in beautiful groups of slender prismatic, white crystals that have filled in the larger spaces between the joints. Sometimes it occurs with calcite crystals which are unmodified rhombohedrons, a rare form for calcite. Some of these calcite crystals occurring with the laumontite are golden-yellow in color, and are penetrated by white laumontite crystals, showing clearly that the laumontite developed first, and



then the calcite formed around it. This golden calcite luminesces strongly after a short exposure to ultra-violet rays. Along the banks of Gwynns Falls, near Franklintown Road, laumontite is also found in rather stout, but imperfect crystals. A comparatively rare form of laumontite occurring at Woodberry, is laumontite pseudomorph after analcite (see below). These pseudomorphs occur as trapezohedrons in a matrix of finely crystalline laumontite. They are a dull white color, and specimens have been found as large as one inch in diameter.

Ranking next in attractiveness to laumontite at Woodberry, is apophyllite,  $K_2O \cdot 8CaO \cdot 16SiO_2 \cdot 16H_2O$ . (1) It is rather rare there, occurring in clear, sparkling, small crystals about 1mm in size.

Heulandite,  $(Na,Ca)_3 Al_5 (Al,Si) Si_{14}O_{40} \cdot 10H_2O$  is another zeolite found in the Woodberry trap occurring in finely crystalline masses with a pearly luster. It also is among the rare ones there.

A zeolite occurring at Woodberry, which is easy to distinguish from the others, is stilbite  $(Ca,Na)Al(Al,Si)Si_6O_{16} \cdot 5H_2O$ . Its white, flat, radiating groups stand out clearly on the rock surfaces.

In the gabbro of the Gwynns Falls valley small, white, acicular crystals of natrolite,  $Na_2 Al_2 Si_3 O_{10} \cdot 2H_2O$ , occurring with analcite,  $Na_2 Al_2 Si_4 O_{12} \cdot 12H_2O$ , have been found. The natrolite is unattractive but the small white, vitreous trapezohedrons of analcite are very beautiful. The largest analcite crystal found measured 7mm in diameter.

- (1) Apophyllite is not a zeolite but is included here because it is closely related in its occurrence.

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#### A SHORT TRIP TO THE EASTERN SHORE (Notes on the Spring Birds of This Section)

By Henri C. Seibert

We built our campfire in a pine woods seven miles west of Berlin, Maryland; and prepared for the night. Before going to bed, however, we searched the neighboring streams for frogs but only found the leopard and the green along with some spring peepers. The spadefoot is known to occur here but although we searched diligently we were unable to locate any. The weather had been very inclement for over a week and consequently the number of amphibians was at a minimum.

The hoots of a horned owl and sporadic spring peeper choruses were the only sounds to break the stillness of the night. The sky had cleared up and we hoped for good weather during the day, but by daybreak the sky was overcast and remained so until nightfall.

As we rose in the early morning, the first birds to greet us were the pine and yellow throated warblers. Both were in song and fairly common in the pine wood areas. As the sky became lighter, Black and White warblers, redstarts, yellow-throats, wood thrushes,

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and oven birds joined their notes to the cheerful noises of an early spring morning.

We had come to this region expressly to visit the cypress swamp that was about 250 yards away. This swamp is part of the Pocomoke River system and possesses all the features characteristic of a typical cypress swamp. The water was dark brown and very placid; the shores were extremely boggy with tree roots winding in and out of the soft ground, and here and there cypress knees from the few remaining cypress trees protruded above the water. A white violet (*Viola lanceolata*) was very abundant, growing in clusters wherever the soil was above water. But it was not the flora that attracted our attention; it was the multitude of birds all about us - a veritable ornithologist's paradise.

This was the typical haunt of the prothonotary warbler, and indeed we found this bird everywhere; it was one of the more common species. Great blue herons flew overhead going both up and down stream. At one time we spotted a lone egret flying upstream, to be followed a moment later by a pair of wood ducks. We stood on a little bridge over the river and from this spot we observed blue-grey gnatcatchers, scarlet tanagers, Louisiana water-thrushes, parula, blue-winged, Kentucky, myrtle, and worm-eating warblers, Carolina chickadees, black-billed cuckoos, white-eyed, red-eyed, and yellow-throated vireos, all this without budging an inch!

As we were about to penetrate the swamp we looked up and saw a pileated woodpecker pass over our heads and disappear behind the trees.

In the deeper recesses of the swamp we continued to find the warblers, many of which were new to our ever growing list. We ran across an old nest of a yellow-crowned night heron and as we were returning, one of these birds was seen.

By this time most of the morning had passed and it was time for us to leave this haven of birds. We proceeded to Ocean City but we only found the herring and laughing gulls and a single greater yellow-legs. Therefore we went on to Bethany Beach and rode along the coast to Rehobeth. Our luck was very much better for we saw many interesting and unusual birds. Spotted, semi-palmated sandpipers, ringed and black-bellied plovers, blue-winged teal and greater and lesser yellow-legs were all on the sand bars and adjacent shallow waters. Quite remarkable was the number of ospreys. At one time I counted 37 in the air! It is well known that eagles chase these birds to force them to drop their fish but this time the osprey's enemies were his brothers. The minute any one of these birds captured a fish the others started pursuit until the prey was given up. The new owner would then be immediately beset by others until he, too, was forced to abandon the fish. One fish I watched changed from one bird to another three times.

We saw a pair of least terns and scoters of indeterminable species on the seaward side of the narrow peninsula. A harsh whistle drew our attention to boat-tailed grackles that haunted the water's edge together with sharp-tailed sparrows.

As we proceeded up the coast we encountered the marsh and

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pigeon hawks, American bittern, and another rarity, the little blue heron. We brought our trip to a close by visiting the Delaware City marshes. The weather was now so severe that we were unable to observe for any length of time, but we did see coots and some Florida gallinules.

When we reached home we amassed our records and discovered that we had recorded 106 different birds, which, considering the bad weather conditions, was not at all unsatisfactory.

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### STUDIES OF NUTRITION IN PARAMECIUM

Phelps in a recent report on the nutritional needs of Paramecium reaches the conclusion that two elements are necessary, and that both are particulate. One element is a suitable living bacterium and the other is some particulate matter in the medium. In his historical summary of the question Phelps makes no mention of two papers by Chejfec (2,3.) In these papers Chejfec reports that he has cultured Paramecium on a suspension of *B. coli* in tap water. The cultures have to be renewed every two or three days, because the bacteria presumably do not multiply in the tap water. If this is done the animals can be cultured indefinitely on such suspensions.

Chejfec's transfers from hay infusion media to the *B. coli* suspensions are probably contaminated by the bacterial flora of the hay infusion, since he does not sterilize the animals but merely keeps them in tap water for ten hours, before making the transfers. Succeeding transfers may however be pure. The suspensions of *B. coli* may contain nutritive material, contrary to Chejfec's implied assumption, due to his method of preparing these suspensions by washing the bacteria from peptone agar slants by means of a pipette. These two possibilities are now being investigated.

But, apart from these objections, even if valid, it would seem that in Chejfec's method a particulate substance in the medium is not necessary for the continuous culture of Paramecium.

- (1) Phelps, Austin, 1934. Studies on the Nutrition of Paramecium. Arch. Protist., 82: 134.
- (2) Chejfec, M., 1928. On the Nuclear Reorganization in Paramecium caudatum. Acta Biol. Exper., 2: 89.
- (3) Chejfec, M., 1929. Die Lebensdauer von Paramecium caudatum in Abhängigkeit von der Nahrungsmenge. Acta Biol. Exper., 4: 73.

John A. Frisch, S. J.

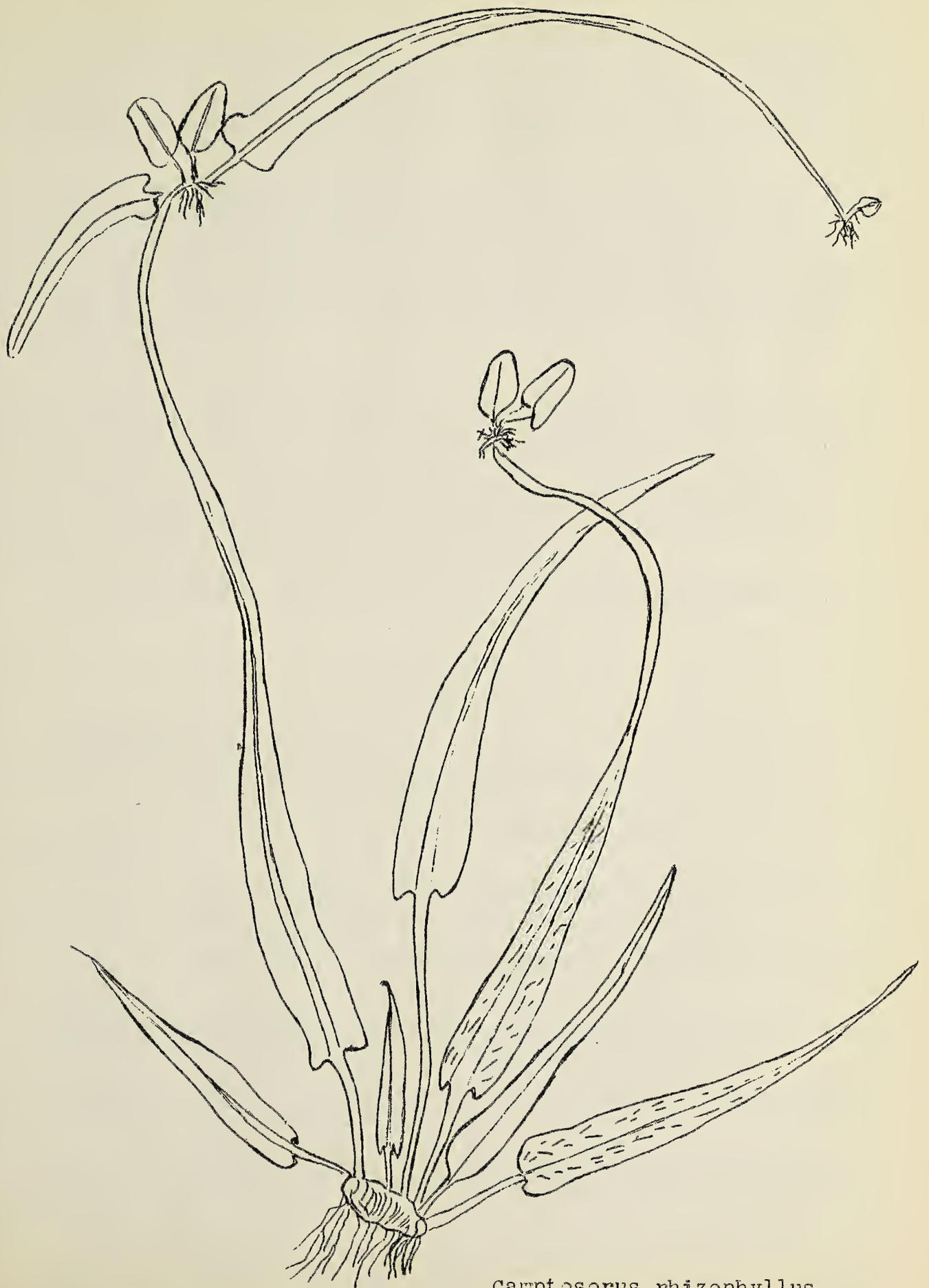
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### THE WALKING FERN (*Camptosorus rhizophyllus* (L.) Link)

By Earl H. Palmer

At the sudden bend of the river, when the bank faces north, and where the creviced limestone hill rises suddenly before you - there look for this quaint fern. The Walking Fern flourishes most





*Camptosorus rhizophyllus*



abundantly in cool, damp, well-shaded limestone regions, but it has been reported growing on sandstone; shale; gneiss, quartzite, and granite. In one locality; the writer has found the *C. rhizophyllus* growing in great profusion on moss covered limestone surrounded by many species of ferns - *Dryopteris marginalis*, *hexagonoptera* and *noveboracensis*, *Adiantum pedatum* and others.

The name, Walking Fern, has given rise to many confusing ideas. The fern has no feet to walk on; true to the Pteridophyta, it produces spores, but this plant has another form of reproduction. The filiform frond bends over, touches soil and takes root thus giving rise to a new plant by the ultimate withering of the connecting tissue; in this way the plant "walks". The connections are usually slow to die and thus we find three and four generations linked together.

The fronds rise in circular tufts from black rootstocks. They seldom grow upward more than a few inches before they bend over and take root. The base of the frond is heart shaped and tapers off to a slender tip. The fronds vary in length from one to fourteen inches. The earlier fronds are short and blunt tipped, devoted apparently to vegetative functions only. The sori are oblong, irregularly scattered on either side of the veins and usually parallel or oblique to the mid-rib.

The *Camptosorus rhizophyllus* remains green the entire year.

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#### NOTES

##### Meetings at the Society

April 2 - Talk by Mr. Walter E. Price, Jr. - "Geological Features of the Baltimore Area." Illustrated.

April 16 - Talk by Mr. Edward McColgan - "Camera Lenses." Illustrated.

April 23 - Talk by Mr. Richard E. Stearns - "The Excavation of Shellfield Indian Villages in Maryland." Illustrated.

April 30 - Talk by Mr. Herbert C. Moore - "Vulcanism." Maps.

##### Exhibits

April 8 - 12. Exhibit of typical woodland scene with plants and animals at the Baltimore Flower Show. First Prize.

April 17 - May 1. Exhibit of Indian artifacts at the Enoch Pratt Library, Mt. Washington Branch.

April 15 - May 7. Exhibit of birds in conjunction with the commemoration of the Audubon Centenary - Enoch Pratt Library, Central Branch.

##### Junior Meetings

April 6 - Talks by Joseph Lutman and Govane McClees - "Diving Helmets."

1890  
The first of the year was a very dry one, and the crops were much injured. The weather was very hot, and the ground was very hard. The crops were much injured, and the yield was very small. The weather was very hot, and the ground was very hard. The crops were much injured, and the yield was very small.

The second of the year was a very wet one, and the crops were much injured. The weather was very cold, and the ground was very soft. The crops were much injured, and the yield was very small. The weather was very cold, and the ground was very soft. The crops were much injured, and the yield was very small.

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The fifth of the year was a very dry one, and the crops were much injured. The weather was very hot, and the ground was very hard. The crops were much injured, and the yield was very small. The weather was very hot, and the ground was very hard. The crops were much injured, and the yield was very small.

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April 20 - General meeting.

Lectures to Outside Organizations

April 5 - At Catonsville Elementary School by Mr. W. Bryant Tyrrell - "Birds, Bird-banding, and Feeding."

April 8 - At Forest Park High School by Mr. John B. Calder - "Maryland Fossils."

April 9 - At Hamilton Junior High School by Mr. L. Bryant Mather, Jr. - "Minerals of Maryland."

April 11 - At Baltimore City College Evening High School - three lectures by Mr. Elra M. Palmer - "Some Maryland Insects."

April 11 - At the Biological Club, Baltimore City College by Donald Roberts - "Frogs, Newts, and Salamanders."

April 11 - At the Baltimore City College - three lectures by Richard Webster - "Representatives of the Insect Orders."

April 16 - At Forest Park High School Ethical Club by Mr. John W. Calder - "Maryland Fossils."

April 17 - At Baltimore City College by Richard Webster - "Representatives of the Insect Orders."

April 19 - At Catonsville Elementary High School by Mr. W. Bryant Tyrrell - "Eagles and Ospreys."

April 24 - At All Saints Parochial School by Harry Putsche - "Snakes and Their Ways."

April 26 - At St. Mary's Star of the Sea Parochial School by Harry Putsche - "Snakes and Their Ways."

April 29 - At Forest Park High School Girls' Leader Club by Mr. John B. Calder - "Maryland Fossils."

Special Meetings and Lectures

April 12 - Reception to the biology teachers of Maryland Schools. Lecture by Dr. John A. Firsch, S.J. - "Wild Flowers of Maryland."

April 13 - Lecture to the Maryland State Biology Teachers' Convention by Mr. Elra M. Palmer - "Collecting, Preparing, and Preserving Laboratory Materials."

April 26 - Reception and opening of the Society's new building to members and friends.

April 27 - Trustees Meeting. Election of Officers: President - Mr. Edmund B. Fladung; Vice President - Mr. Gilbert C. Klingel; Secretary - Mr. John B. Calder; Treasurer - Mr. Edward McColgan.

Committees

Executive - Mr. Gilbert C. Klingel, Chairman, Mr. John B. Calder and Mr. Edward McColgan. Membership - Mr. John B. Calder, Chairman, Mr. Herbert C. Moore, Mr. Elra M. Palmer. Finance - Mr. Edward McColgan, Chairman, Mr. A. Llewellyn Jones and Mr. Herbert C. Moore. Museum - Mr. Edmund B. Fladung, Chairman, Mr. Gilbert C. Klingel and Mr. Elra M. Palmer.

THE HISTORY OF THE

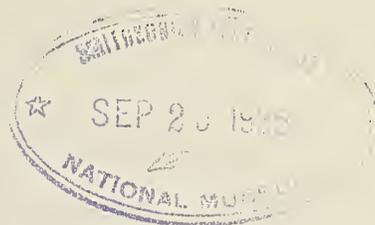
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The Natural History



Society of Maryland

## BULLETIN



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MAY, 1935

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### A BRIEF HISTORY OF THE COPPER MINE AT BARE HILLS, MARYLAND.

By Herbert C. Moore

The Bare Hills are now located less than a mile from Baltimore City, near the suburban section known as Mt. Washington. That portion of the Hills where the chrome mining operations were carried on is near Falls Road (see article by Elra M. Palmer - "Chrome Ore in Maryland", Vol. V, No.1), while the copper mine is on Smith Avenue. Old Pinlico Road connects Falls Road and Smith Avenue. As Baltimore City increased in size, Bare Hills, quite naturally, became closer. In the 60's the Hills were seven miles from the city.

Copper was discovered at Bare Hills in the days when Smith Avenue was a mere dust road. The earliest reference appears to be a Maryland law case dated 1848, deciding a dispute which had its beginning in 1844 and 1845.

Sometime prior to 1844, copper had been discovered on the farm of Thomas B. Watts, who desired that the deposits should be explored and worked. (In reality, he was the reversioner, his mother possessing a life interest in the land.) He, very probably, having little money, and knowing nothing about mining, entered into an agreement with Thomas Petherick, a mining engineer of some repute, for the exploration of the copper on the farm. In the agreement Watts received one dollar consideration and a promise of a full fifteenth part of all the minerals after the same had been rendered fit for smelting, clear of all expenses. Petherick paid Watts \$30.00 "to make an excavation to the shaft sunk on the copper ore on the farm." Apparently a small shaft had been already made.

In December, 1844, Petherick transferred his interest to Isaac Tyson, Jr. This gentleman attempted to hold Watts to his agreement, but Watts, perhaps advised that he had made an unequal contract, treated it as null. Tyson brought suit for specific performance. The case was argued by some of the most noted lawyers

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the specific procedures and protocols that must be followed when recording transactions. This includes details on how to categorize expenses, how to handle receipts, and how to ensure that all entries are properly documented and reviewed.

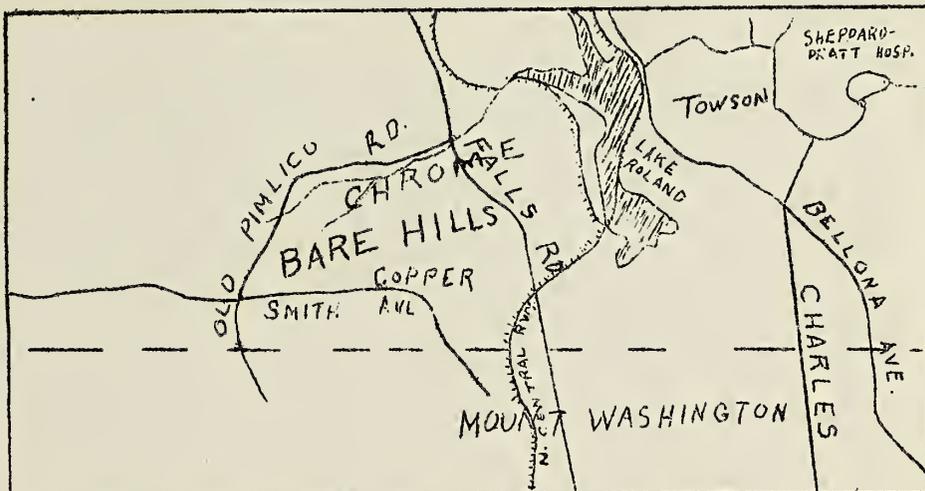
3. The third part of the document discusses the role of the accounting department in maintaining these records. It highlights the need for regular audits and reviews to ensure that the records are accurate and up-to-date.

4. The fourth part of the document provides a summary of the key points discussed and reiterates the importance of strict adherence to the established procedures and protocols.

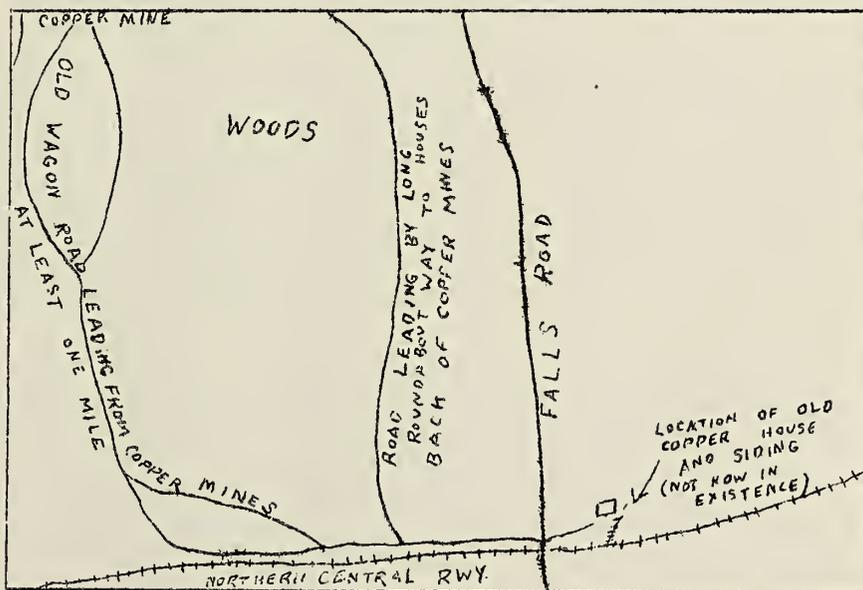
5. The final part of the document concludes with a statement of commitment to maintaining the highest standards of accuracy and transparency in all financial reporting.

6. The document is signed by the Chief Financial Officer, who is responsible for ensuring that all financial reporting is accurate and compliant with applicable laws and regulations.

BARE HILLS



After Maryland Geological Survey Map  
 (Showing location of Copper and Chrome sections)



(Original rough sketch of the old road leading from the  
 Copper Mine to Bare Hills Station in the 1860's.)

Figure 1

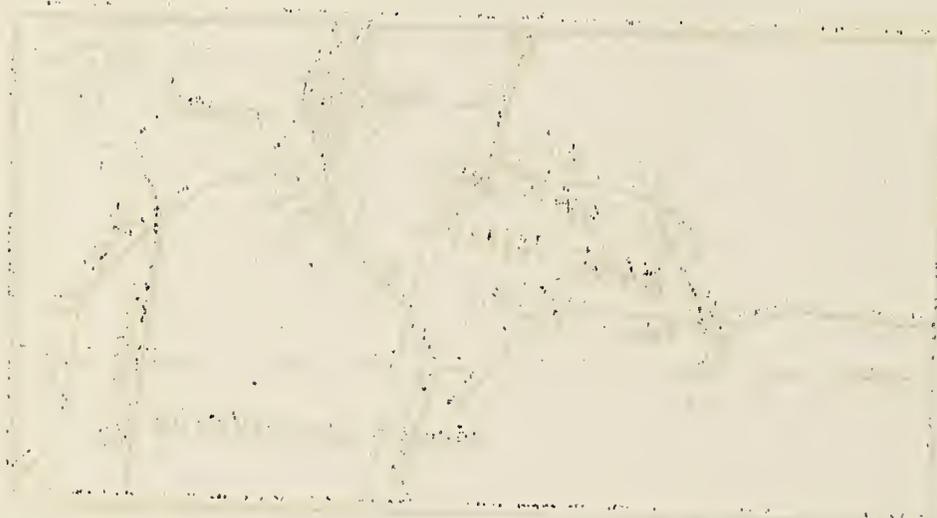


Figure 1: A rectangular plot showing a complex network of lines and points, possibly representing a field layout or a data visualization.

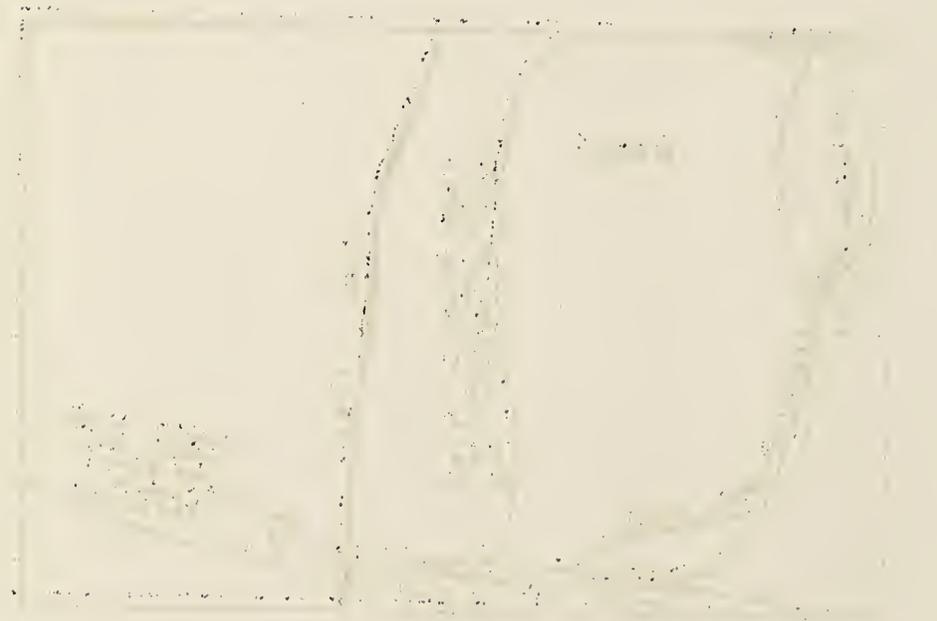


Figure 2: A rectangular plot showing a large, irregular shape with internal lines, possibly representing a field layout or a data visualization.

of the time - Reverdy Johnson and J.H.B. Latrobe for Tyson, and T. Parkin Scott for Watts. The Court decided that the agreement was one-sided. Petherick (or his assignee, Tyson) could, under the agreement, use the mine if it were found productive, but if found otherwise, he could just lag along, doing nothing, and all the time depriving Watts of revenue which he might be able to get from somebody else who knew better how to work it, or by using the property for other purposes. Therefore, the contract was not mutual.

Subsequently it seems, from an isolated allusion in Scarf, the great Maryland historian, that Tyson did dally with the mine. Others also endeavored to mine the copper there. However, the operations between 1845 and 1855 were carried on none too successfully, although the shaft was dug to a depth of 350 feet. The drainage of water, always a great question at the Bare Hills copper mine, and the hoisting of the ore and rubbish were effected by means of a small steam engine of 4 horse power, the water being drawn up in buckets through a small irregular shaft which struck the vein at the depth of 140 feet, below which point another small opening was made on the dip of the vein about 180 feet. In 1855, Dr. William H. Keener acquired a small interest in the mine, and in 1858, he purchased a controlling interest. Captain Edward Powers, his superintendent, abandoned the combined use of shaft and slope, widened the slope and extended it to the surface.

In 1860 the Bare Hills Copper Mining Company was incorporated by Act of the General Assembly of Maryland. Later, in 1864, the company was reorganized with Keener as president, and work commenced on a greater scale. Up to 1864 the shaft, which was not vertical but on an incline of 45 degrees, had been dug to a depth of 590 feet. The new system of pumping and hoisting was effected by a steam engine cylinder with two boilers, 25 feet long and  $3\frac{1}{2}$  feet in diameter. An ore crusher was attached to the engine with a pair of rollers 18 inches in diameter and 14 inches in length, and three jigger machines of the oblong type, for sifting, were used. Other very important improvements were made, such as a suitable dressing house for the ore (84 x 45 feet), an office, smith's shop and carpenter's shop, magazine, dwelling for the captain, and four blocks of miners' houses, each 50 feet.

In 1864 the mining company had a capital stock of \$500,000 in 100,000 shares of \$5.00 each. All was apparently subscribed to at the time or within a short period, for two dividends on the total capital stock were declared before 1866, but the working capital was not absorbed at the outset as was so often done. Furthermore, \$25,000 was loaned on good security. Keener, before 1864, had explored the levels and exposed to easy access enough ore, so that it was not necessary to spend a great deal in sinking the shaft.

During the first two months of the new company's operations, over 175 tons of ore were mined. Only twelve miners were working at the time.

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From March, 1864 to March, 1865, 700 tons were taken from the mine, and the shaft was dug fifty feet deeper to the 650 foot level. (See sketch).

During the month of May, 1864, alone, 80 tons of ore were brought to the surface by 25 miners, and in June, 1864, 40 hands were engaged at the mines. Thereafter, until 1867, the average was 25 men, 9 for exploration and 16 to work the ore.

A resumé of the period 1863 - 65 shows; in 1863 - 432 tons of 2,352 lbs. of 11 1/2-100 per cent of copper were mined with a value of \$21,558. In 1864, 700 tons - value about \$54,300. In 1865 about 75 tons a month. In June, 1864, a dividend was declared of 2 1/2 per cent - \$12,500., on the capital stock of \$500,000., and in December, another of 4 per cent, or \$20,000.

Weed in "Copper Deposits of the United States" writes that Dr. Lehmann, once chemist at the Baltimore Copper Works, reported yearly shipments prior to 1864, as varying between 2000 - 2500 tons of 15 - 20 per cent ore. Inasmuch as the records of the Baltimore Copper Works were destroyed by fire and his figures are mostly from memory they are probably not so accurate as the ones given by the copper mining company itself.

The records between 1865 and 1868 do not seem to exist. In July of this latter year, a great cloudburst and flood, mentioned in Scarf and other Maryland histories as the worst one Baltimore ever had, inundated much of the section around Jones Falls and the Patapsco River, washed away half a dozen bridges, including the bridge at Mount Washington, broke the dam which stored up the water pumped out of the mine, used for dressing the ore, flooded the mine, and stopped work for sometime. (This flood is described vividly in the American and Commercial Advertiser of July 24, 1868. Several people were drowned in Baltimore City, while at Ellicott City over thirty persons lost their lives.)

The water was pumped out, and the mines functioned intermittently from 1867 to 1887. The shaft during this period reached 900 feet in depth, inclining under Smith Avenue. For the ten year period 1866-77, the annual output was from 800 to 1,200 tons of "cobbed ore", averaging 18 per cent copper, with 1000 to 1500 tons of "hatched" ore or concentrates. From 1866 to 1887 the shipments gradually lessened, averaging about 50 tons a month of 18 per cent "cobbed ore" from 1883 to 1886. At that time copper was worth a price of about 15¢ a pound. (\$54.00 per ton). The gross valuation from 1864 to 1887 was then about \$1,750,000. for 32,500 tons of 18 per cent material.

In 1880, according to the Tenth Census report, the mine yielded 17 tons of concentrates, from which 1,275 pounds of copper were produced. The mine was undoubtedly 'dying' in the 80's. In the same year the Mineral Hill Mine near Finksburg, Maryland, yielded 164,640 pounds of copper - quite a difference.

In the late 90's the mine was operated again. A number of

THE UNIVERSITY OF CHICAGO  
DEPARTMENT OF CHEMISTRY  
CHICAGO, ILLINOIS

TO THE HONORABLE CHIEF OF BUREAU OF CHEMISTRY  
WASHINGTON, D. C.

SIR: I have the honor to acknowledge the receipt of your letter of the 10th inst. and in reply to inform you that the same has been forwarded to the proper authorities for their consideration.

I am, Sir, very respectfully,  
Yours truly,  
[Signature]

Very truly yours,  
[Signature]

Enclosed for you are the following documents:

1. A copy of the report of the committee on the subject of the proposed change in the name of the Department of Chemistry.

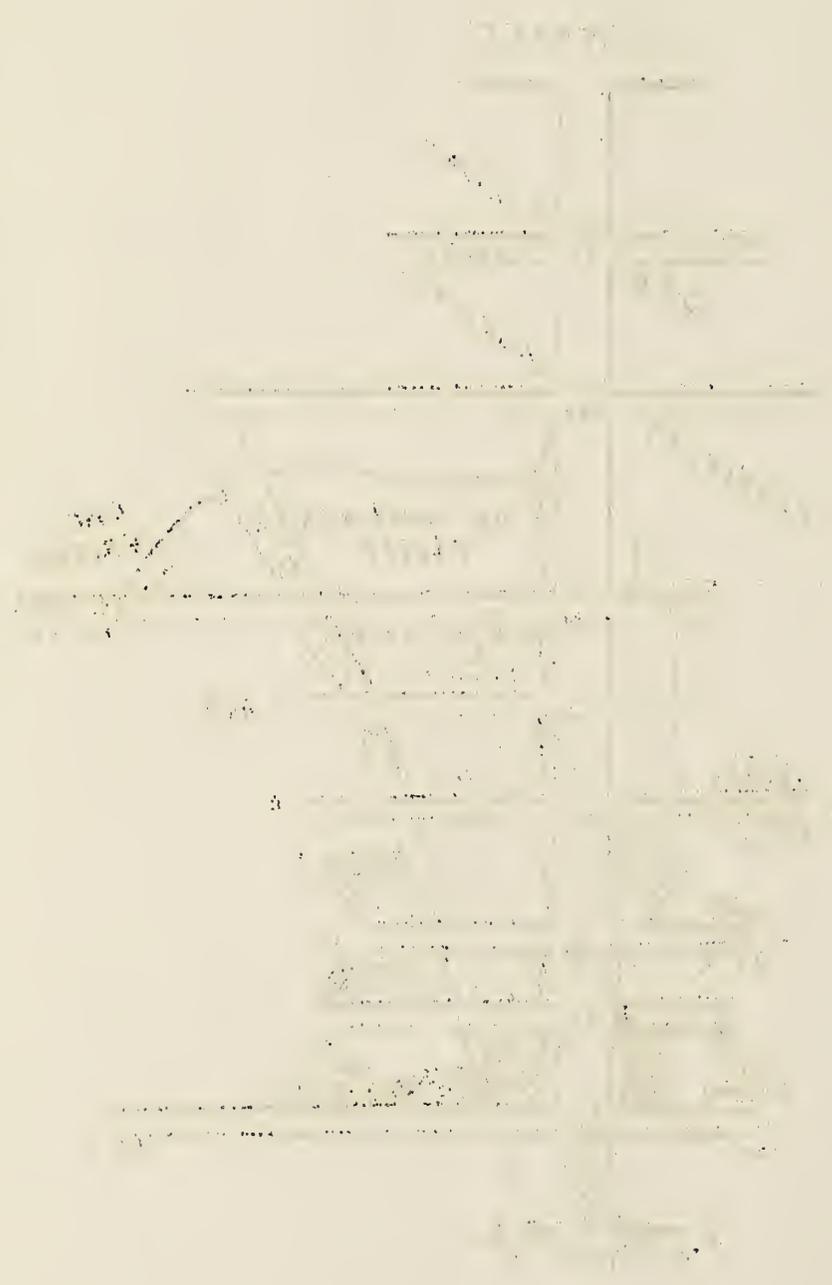
2. A copy of the report of the committee on the subject of the proposed change in the name of the Department of Chemistry.

3. A copy of the report of the committee on the subject of the proposed change in the name of the Department of Chemistry.

I am, Sir, very respectfully,  
Yours truly,  
[Signature]



1. The first part of the paper is devoted to a general discussion of the problem. It is shown that the problem is well-posed and that the solution exists and is unique.



The second part of the paper is devoted to a detailed analysis of the solution. It is shown that the solution is smooth and that it satisfies the boundary conditions. The third part of the paper is devoted to a numerical analysis of the solution. It is shown that the numerical solution is accurate and that it converges to the exact solution.

Mt. Washington residents became stockholders in an unsuccessful company. Very little was done - in all six carloads of ore went to a New Jersey smelting company. The fact that the company exchanged stock for provisions at the general store, for the services of a mason who erected foundations, and for other material shows that it was in a weak financial condition. According to the stockholders and one former director who were interviewed "there were some honest officers of the company and some dishonest ones." In any event, the stockholders lost their money.

During this last venture, new machinery, an air compressor, and other equipment were set up. One nearby resident states that after all the money was gone, coal, which kept the steam engine going - on which the pumps depended - could not be purchased; the mine filled up with water again. And truly, so it is now.

After this last disastrous enterprise during which the property was mortgaged and sold, it came into the hands of the present owner, a resident of Washington, D. C.

Another phase of this history is presented by men who were workers in or above the mine many years ago. In this connection, credit should be given Mr. J. Doheny, who worked in the mines as a boy in 1866 and 1867, Mr. Joseph Burns, who now lives where the old copper house near the siding at Bare Hills' Station once existed, and who formerly lived in the old miners' houses not far from the mines, Mr. George Gambrell, who worked above the copper mine as a boy, and who later performed the masonry work referred to heretofore, and Mr. J. Starr, who worked there in the 80's.

The period of greatest prosperity was apparently in the 1860's. In those days, however, wages were not high. The miners received about \$1.50 a day, the surface men \$1.25, and the boys - 50¢. The surface men and boys worked in one shift, ten hours - ten hours of daylight; the miners worked in three shifts, eight hours each, and since it was always 'night' in the mine, it mattered not at all. The miners used candles, either stuck in clay on their stiff hats or placed on a rock.

The ore was mined by means of hammer and black blasting powder. Later the air drill came into use, a method by which air was pumped down a pipe to the apparatus. Dynamite was not used in the earlier days, - it was hardly known - instead they used blasting powder which was put in a hole with a fuse. If the hole was wet, they made a paper cartridge. The rock foundations of the old powder house lie where the house itself once stood, a hundred yards or so from the mine.

A wooden cart with an iron frame was pulled up a three foot gauge track by a cable on a drum, run by the engine. It took from four to five minutes for a load to reach the top, for the cable on the drum moved slowly.

After the ore arrived at the surface, the solid pieces of copper were removed, the "dead" or dreg (pronounced by the miners "dradge") was thrown away, and the remainder crushed, after which it was given to the boys to sift. Next, the copper concentrates were put in a trough and washed by water which was pumped up from the mine and dammed up.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data. The text also mentions that regular audits are necessary to identify any discrepancies or errors in the accounting process.

Furthermore, it is noted that the accounting system should be designed to be user-friendly and efficient. This helps in reducing the time and effort required to enter and process data. The document also highlights the need for proper segregation of duties to prevent fraud and ensure the integrity of the financial information.

In addition, the text discusses the role of the accounting department in providing valuable insights into the company's financial performance. By analyzing the data, management can make informed decisions regarding budgeting, cost control, and overall business strategy. The document also mentions the importance of staying up-to-date with the latest accounting standards and regulations.

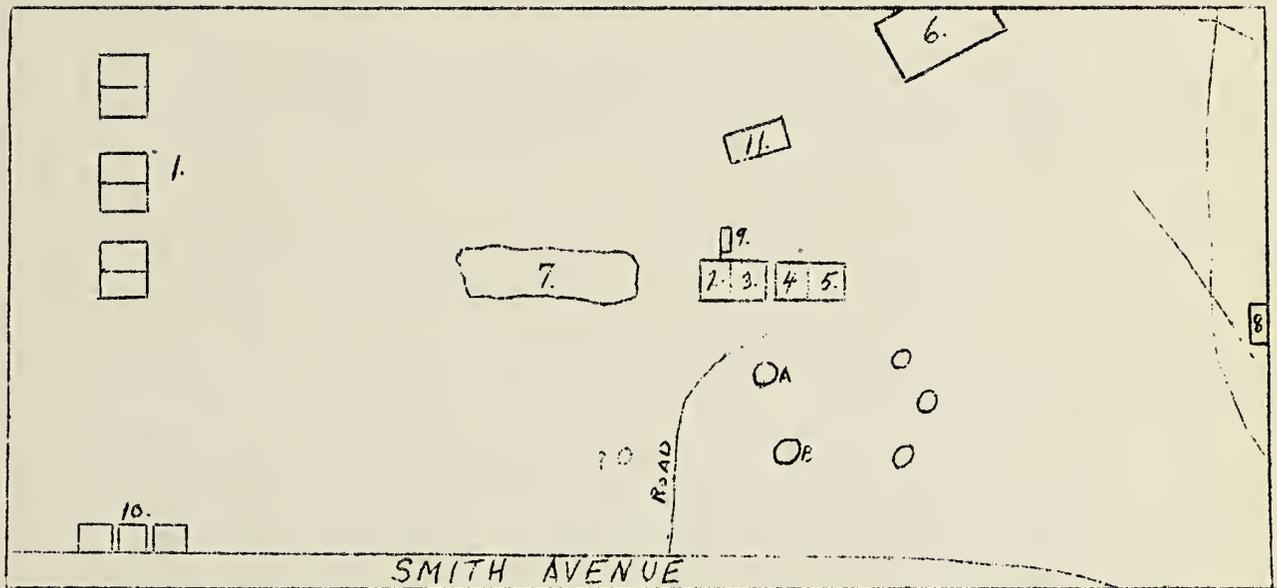
Overall, the document stresses that a robust accounting system is essential for the success of any organization. It provides a clear framework for how to set up and maintain such a system, ensuring that all financial activities are properly recorded and reported. The text concludes by stating that a well-implemented accounting system can significantly enhance the financial health and stability of the company.

The document also includes a section on the importance of data security. It advises that all financial data should be stored securely and protected from unauthorized access. This can be achieved through the use of strong passwords, encryption, and regular backups. The text also mentions the need for a disaster recovery plan to ensure that the data can be restored in the event of a system failure or natural disaster.

Finally, the document emphasizes the importance of communication and collaboration between the accounting department and other departments within the organization. This ensures that all relevant information is shared and that the accounting system is properly integrated with other business processes. The text concludes by stating that a strong accounting system is a key component of a successful business strategy.

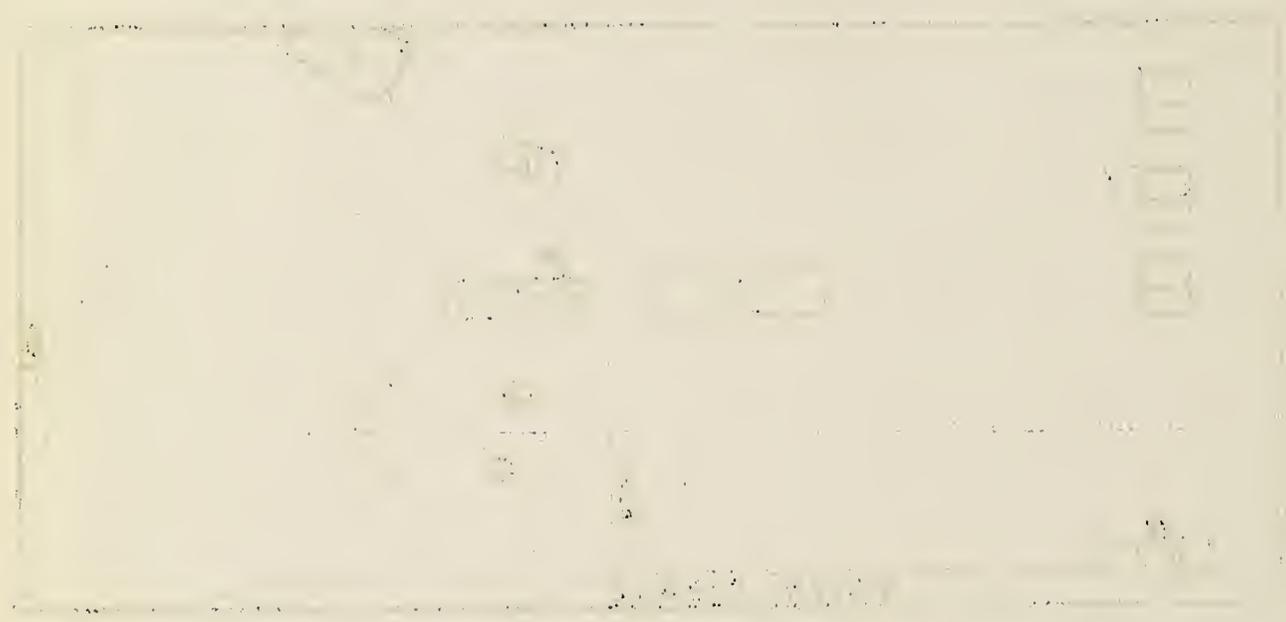
In conclusion, the document provides a comprehensive overview of the key elements of a successful accounting system. It covers everything from data entry and processing to reporting and analysis. By following the guidelines outlined in the document, organizations can ensure that their financial data is accurate, secure, and easily accessible. This will enable them to make better financial decisions and improve their overall business performance.

ROUGH SKETCH OF THE BARE HILLS COPPER  
MINE SECTION AS IT PROBABLY APPEARED IN 1900  
(Constructed from the present ruins)



- 1 - The three old double houses - dating to the late 50's or early 60's. (At that time miners' habitations.)
- 2 - Boiler
- 3 - Engine
- 4 - Crusher
- 5 - Cobbing House
- 6 - Captain's (Superintendent's) House
- 7 - Where water pumped from mines was dammed up. (Reservoir)
- 8 - Powder House
- 9 - Air Compressor (Supplying air for the air drills)
- 10 - Houses - probably dating back to the 80's
- 11 - Office of Mining Company (Probably erected in the 60's)
- Ⓐ - Main mine opening
- Ⓖ - Opening leading to main shaft (leading more directly from engine house)
- 0 - Minor openings

THE UNIVERSITY OF CHICAGO  
DEPARTMENT OF CHEMISTRY  
5400 SOUTH DIVISION STREET  
CHICAGO, ILLINOIS 60637



1. The apparatus is used for the distillation of liquids with boiling points between 40°C and 150°C. The condenser is water-cooled. The receiver is cooled with ice water. The column is packed with 10 mesh porous polymer beads. The flow rate is controlled by a valve at the bottom of the column. The pressure is maintained at 1 atm. The temperature of the column is 50°C. The distillate is collected in the receiver. The residue is collected in the bottom flask. The apparatus is used for the separation of mixtures of liquids with different boiling points. The efficiency of the separation is high. The apparatus is easy to use and maintain. The cost is low. The apparatus is suitable for laboratory use.

The ore, in the earlier period, was taken by horse and wagon through a natural cut in the hills to Bare Hills Station, where a copper house and a siding were located on the Northern Central Railway (formerly the Baltimore and Susquehanna). Old residents do not recollect the copper house and siding as being there in the 70's so this route through the hills was probably abandoned in the 60's. The siding was about a mile from the mine. A hundred yards from where it once stood specimens of copper, which probably had been dropped there over sixty years ago were found by Mr. Burns and the writer. The copper sent to the copper house near the siding was transported to Canton. At a later date the ore was taken down Smith Avenue to the Mt. Washington Station, instead of by the old route. (See sketch of the old roads leading to Bare Hills Station).

Most of the miners lived around Bare Hills. Six or seven of the old miners' houses were still in existence and occupied a few years ago, and the old mining company office is now used as a dwelling.

As for amusements, old miners declare, with a sigh, that whiskey was one of the very few.

No laws had been passed in the third quarter of the last century in regards to child labor. Two of the men from whom information was obtained worked as boys, dressing the ore on the surface of the mines. Mr. Doheny, who was eleven years of age when he worked at the mine, says that there were at least ten other boys between the ages of twelve and eighteen working there at the same time. He was the youngest. Most of the boys had stopped school in the fifth or sixth grades. He says that the boys were fired daily for various pranks by old Captain Cooper, and then, as they started to leave, were called back again. The captain, he added, was superstitious about whistling in or near the mines, believing accidents would follow. Happily, however, there does not seem to be a record of any.

Practically all of the miners were Irish. (Every person interviewed was very emphatic about this point). This was especially true in the early period of the mine's history. So far as can be traced, no slaves were used in working the mine before the Civil War, and certainly not in Tyson's time, for he was a strict advocate of abolitionism. Old residents do not remember even seeing free negroes thereabouts.

The ruins of the old engine house, the foundation where the air compressor rested, the foundations of the old powder house, the old reservoir (about 75 feet x 20 feet) where the water was stored up (now empty), a water filled shaft, the old office, the captain's house, and a few houses in which the miners lived, besides the hills of 'dead' materials, are about all that are left on the surface to show what was once a busy mine. (See diagram, which from present appearances, attempts to illustrate how mine district looked in 1900).



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17. Prospectus of the Mineral Hill Mine, Carroll Co., 1860. (Valuable contemporary references.)
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NOTESMeetings at the Society

May 8 - Talk by Mr. A. Llewellyn Jones - "History of Principio Furnace."

May 14 - Talk by Mr. Irving E. Hampe - "Mammals of Maryland,"  
Illustrated

CHAPTER IV

The first part of the book is devoted to a general survey of the subject.

The second part is devoted to a detailed study of the various aspects of the subject.

The third part is devoted to a study of the various methods of the subject.

The fourth part is devoted to a study of the various results of the subject.

The fifth part is devoted to a study of the various applications of the subject.

The sixth part is devoted to a study of the various conclusions of the subject.

The seventh part is devoted to a study of the various prospects of the subject.

The eighth part is devoted to a study of the various problems of the subject.

The ninth part is devoted to a study of the various questions of the subject.

The tenth part is devoted to a study of the various issues of the subject.

The eleventh part is devoted to a study of the various topics of the subject.

The twelfth part is devoted to a study of the various subjects of the subject.

The thirteenth part is devoted to a study of the various branches of the subject.

The fourteenth part is devoted to a study of the various fields of the subject.

The fifteenth part is devoted to a study of the various areas of the subject.

The sixteenth part is devoted to a study of the various domains of the subject.

The seventeenth part is devoted to a study of the various spheres of the subject.

The eighteenth part is devoted to a study of the various regions of the subject.

May 21 - Talk by Mr. L. Bryant Mather, Jr. - "What Maryland Is Made Of."

May 28 - Talk by Mr. Roger Hecklinger - "Iron Pyrite in the Manufacture of Sulphuric Acid."

Junior Meetings - May 4 - Talk by Clyde Reed - "Maryland Violets." May 18 - Lecture by Mr. Irving E. Hampe - "The Mammals of Maryland."

Exhibits - May 15 to June 6. At Enoch Pratt Library, Branch 12 - Minerals. May 22 to May 27. Exhibit at Maryland State Normal School - Plants. May 28 to May 31 Exhibit at Maryland State Normal School - Insects and How to Collect and Preserve Them.

#### Lectures to Outside Organizations

May 1 - To Troop 17 B.S.A. by Mr. A. Llewellyn Jones - "The Bare Hills Deposits."

May 15 - At Gilman Country School, by Mr. Gilbert C. Klingel - "Diving in the Chesapeake."

May 16 - At Citizens Conservation Camp, Avalon, Maryland, by Mr. Gilbert C. Klingel - "Diving in the Chesapeake."

May 17 - To Troop 17 B.S.A. by Mr. A. Llewellyn Jones - "The Bare Hills Copper and Chrome Mines."

May 22 - To Science Club, Baltimore City College by Richard Webster - "Insects of Maryland."

May 24 - To Troops 23 and 100 B.S.A. by Mr. H. C. Robertson - "Snakes of Maryland."

May 28 - To Knights of Columbus by Dr. John A. Frisch, S.J. - "Ants and Their Ways."

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#### REPORT OF ROCKS AND MINERALS OUTING, MAY 19, 1935

Every year the Rocks and Minerals Association of Peekskill, New York, sponsors National Rocks and Minerals Day. In every state of the Union parties gather and proceed to devote the day to collecting minerals. 1935 saw the Third Annual Outing. The Natural History Society has led the last two in Maryland.

A party of eighteen gathered at the meeting place on the morning of the 19th. The early arrivals had an opportunity to visit the nearby headquarters of the Society, where the laboratories and collections were inspected. With a fine day for collecting the party left in high spirits, and the localities mentioned below were visited. At the Jones Falls location some interesting pot-holes and faults in the rock were examined, and throughout the day many photographs were taken of the formations.

(1) Near Baltimore at Lansdowne in the sedimentary deposits - massive hematite, limonite, wood replaced by limonite, lignite, concretionary siderite, and ironstone sand concretions.

(2) In Baltimore at Jones Falls Quarry in gneiss - albite, microcline, biotite, garnet, ilmenite, stilbite, and pyrite.

(3) Falls and Clipper Mill Rds., in Baltimore. Found in pegmatite, - microcline, muscovite, garnet, tourmaline, apatite, and autunite.

(4) In Baltimore at Woodberry Trap Quarry - in gabbro - laumontite and calcite crystals.

(5) Near Bare Hills, Baltimore County at the McMahon Quarry in the Cockeysville Marble - phlogopite, tremolite, brown and black tourmaline, and rutile.

Walter E. Price

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice to ensure transparency and accountability. This section also outlines the procedures for handling discrepancies and the role of the accounting department in reconciling accounts.

Furthermore, the document highlights the need for regular audits to identify any potential issues or irregularities. It states that the audit process should be conducted by an independent party to provide an objective assessment of the financial statements. The results of the audit should be used to improve internal controls and prevent future errors.

In addition, the document provides a detailed overview of the company's financial performance over the past year. It includes a comparison of actual results against budgeted figures and identifies the key factors that contributed to the overall success or challenges. This analysis is intended to provide management with valuable insights for strategic planning and decision-making.

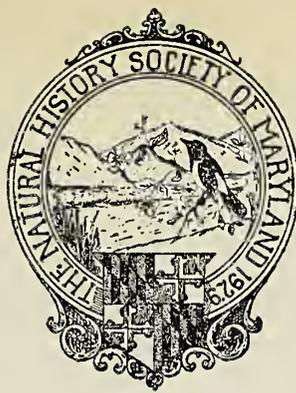
The document also addresses the company's compliance with applicable laws and regulations. It confirms that all financial reporting is done in accordance with the relevant accounting standards and that the company has implemented robust internal controls to mitigate risks. This section serves to reassure stakeholders of the company's commitment to ethical and legal practices.

Finally, the document concludes with a statement of appreciation for the support and cooperation of all employees and stakeholders. It expresses confidence in the company's future growth and success, and reiterates the commitment to providing accurate and timely financial information. The document is signed by the Chief Financial Officer and the President of the company.

The following table provides a summary of the key financial metrics for the year. It shows a steady increase in revenue and a decrease in expenses, resulting in a significant improvement in profitability. The company's financial position remains strong, with a healthy balance sheet and a solid cash flow. These results reflect the company's operational efficiency and effective financial management.

In conclusion, the document provides a comprehensive overview of the company's financial performance and internal controls. It highlights the company's commitment to transparency, accuracy, and compliance. The financial results are positive, and the company is well-positioned for continued growth and success in the future. The document is intended to provide stakeholders with the information they need to make informed decisions.

The document is prepared in accordance with the requirements of the relevant accounting standards and regulations. It is intended to provide a clear and concise summary of the company's financial performance and internal controls. The information provided is accurate and reliable, and it is intended to provide stakeholders with the information they need to make informed decisions.



**BULLETIN**

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Vol. V No. 10

JUNE, 1935

\$1.00 a Year

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SOME IMPLEMENTS COLLECTED FROM THE INDIAN MOUNDS OF  
FLORIDA BY OUR DEPARTMENT OF ARCHAEOLOGY.

By Richard E. Stearns

During June, 1930, we decided to take a trip to lower Florida for the purpose of studying the shell mounds. On this trip we were fortunate, for we located several town sites on the west coast of Florida as well as two on the east coast.

The first mound encountered, situated about ten miles below St. Augustine on the Ocean Shore Boulevard, was very large, faced the Atlantic Ocean and extended several hundred yards westward into the inland passage. The Spaniards in the early days of St. Augustine referred to it.

A series of sites clustering about the inlets a few miles south of Daytona Beach was also visited.

On the west coast of Florida, a shell mound on Sneads Island in Tampa Bay was inspected, as well as a shell field on the Alafia River, which drains into Tampa Bay.

In the Ten Thousand Island district a large shell mound was found at Naples and two others on Marco Island.

Since 1930, we have twice revisited these sites and have collected a large quantity of artifacts. Many photographs were taken too. Since the largest collection of implements we found came from the Ten Thousand Island district, we shall discuss the principal types of this locality.

Inasmuch as no stone of suitable quality for fashioning cutting implements was found in lower Florida, shells acted as a substitute. The most common types are axes and hammer<sup>s</sup> made from whole conch shells (*Fulgur perversum*). Holes or notches were knocked in the sides to accommodate the handle, and the beak was ground to a sharp edge (Figure 1), or left to wear flat as in the case of a hammer (Figure 2).

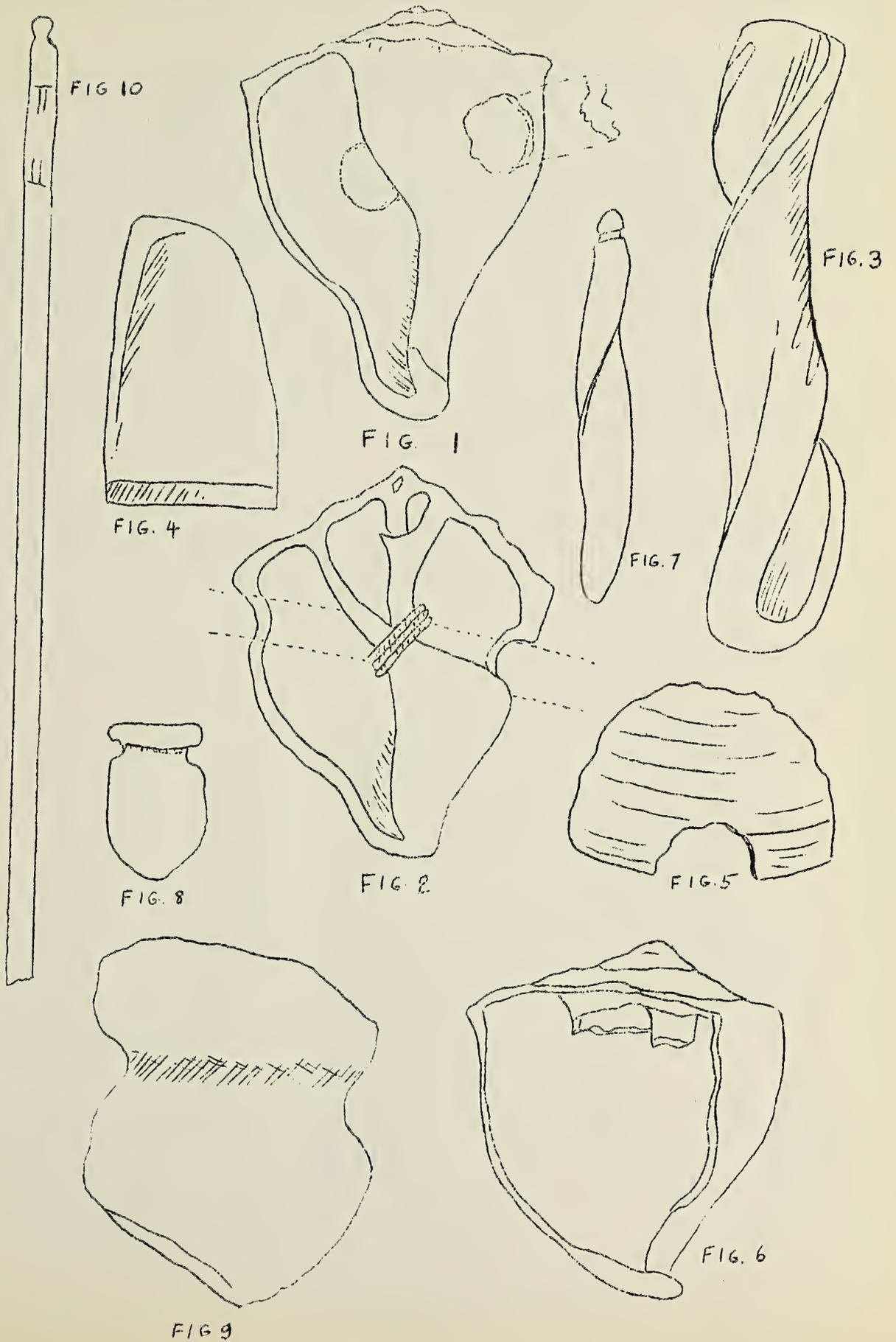


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A few gouges were found made from the collumella of *Faciolaria* (Figure 3), and celts made from the sides of *Fulgar perversum* (Figure 4).

Net sinkers, fashioned from the round shell clam (*Venus mortoni*) were collected quite frequently. (Figure 5).

A drinking cup made of *Fulgar perversum* is shown in Figure 6.

Also many pendant ornaments were found, - two fashioned of shell, one of fossil bone, and the rest of line rock, the only stone available from which anything could be made. Figure 7 illustrates the shell pendants, and Figure 8 those of line rock.

A groove hammer of line rock, the only one found, is shown in Figure 9.

Some pointed implements of bone were unearthed, an example of which is depicted in Figure 10. It is shown full size, but it is minus the point. Two engraved marks may be seen below the grooved end.

Pottery fragments were very numerous in these mounds and a large number of decorated pieces were collected. From a study of the fragments the vessels seem to have been of the shapes shown in Figure 11. Some are plain while others have incised designs about the rims as shown in Figure 12.



FIG. 11

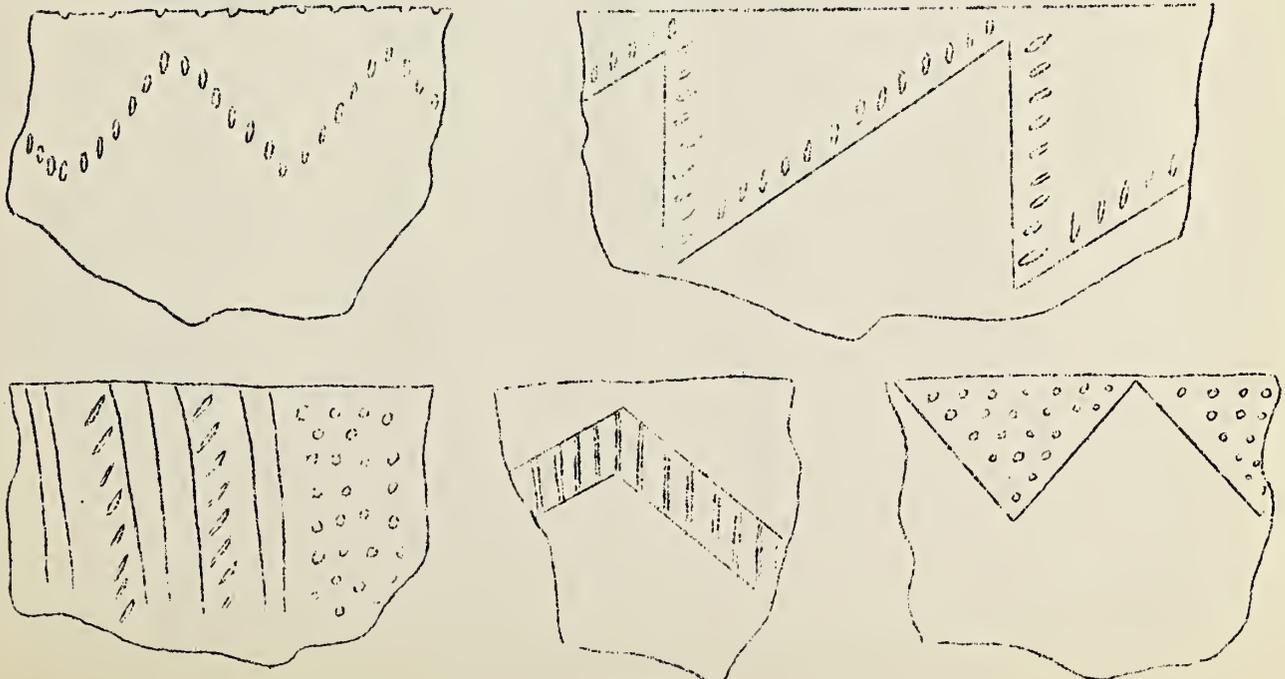
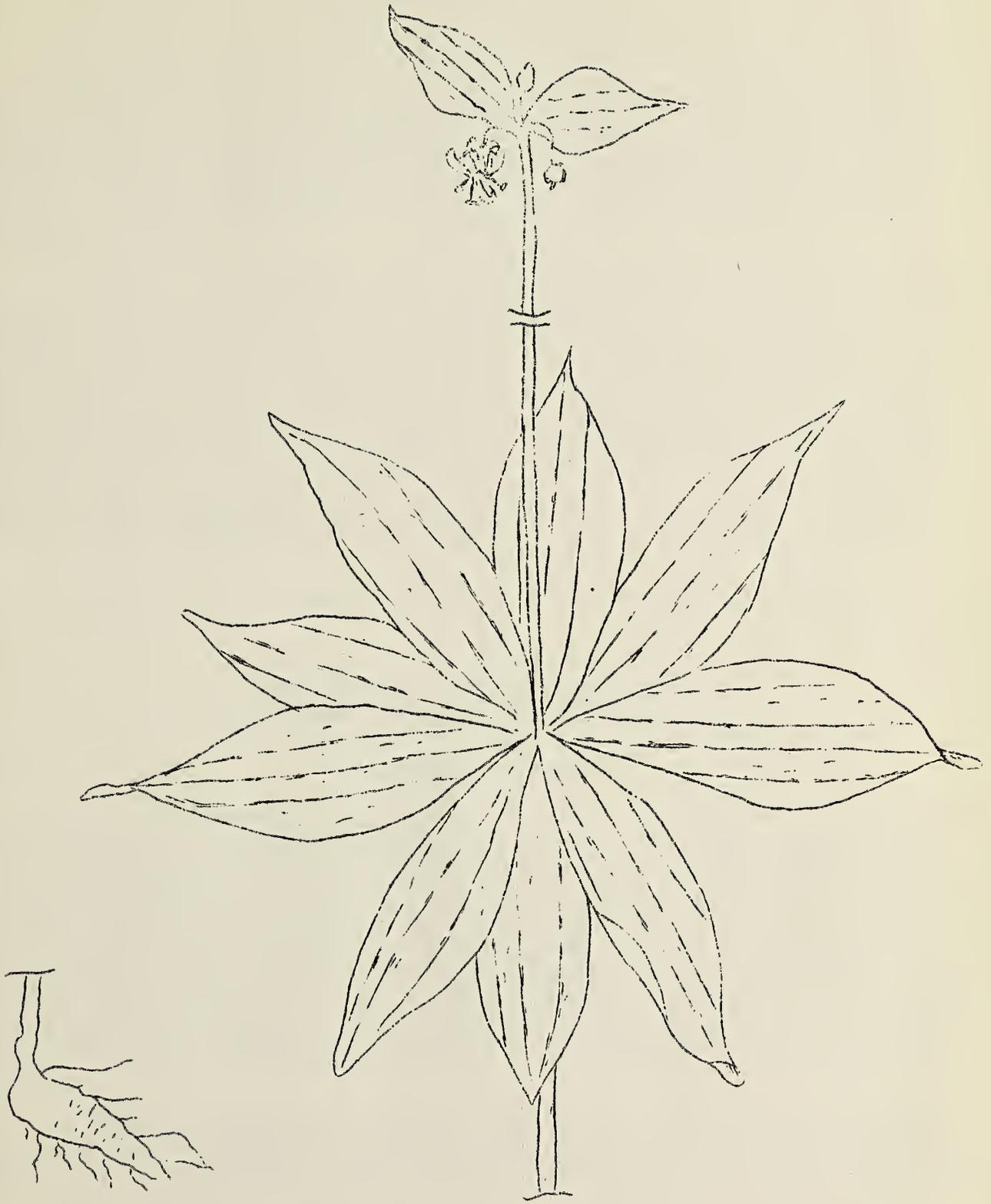


FIG. 12





*Medeola virginiana* (L.)



*Handwritten botanical label, possibly identifying the species.*

THE INDIAN CUCUMBER-ROOT  
(*Medeola virginiana* L.)

By Earl H. Palmer

This plant, native to most of our shaded, moist woodlands, had a part in the Indian diet, as the name implies. The white, crisp root tastes like our cucumber of commerce. The Indians of North America found the root edible and used it extensively as a food. Joseph E. Harned in his book, "Wild Flowers of the Alleghanies," says that the *M. virginiana* was used as a cure for "torpid livers."

The average specimen has a wooly stem twelve to eighteen inches high but when found in very rich, marshy lands it often reaches a height of twenty-four inches. It can easily be recognized by the ovate, lance-shaped leaves arranged in a whorl about mid-way up the stem. There are usually nine leaves - I have counted seven and eight, but nine is the average for most plants. The leaves are pale green with dark green ribs. Also the tip of the wooly stem bears two or three smaller leaves, of the same shape as the lower ones, and two or more flowers which are pale green with five to six stamens and a pistil. The little purplish berries often furnish food for our smaller birds.

During May and June this plant will be found in bloom.

--\*

NOTES ON THE WHITE-FOOTED MICE  
(*Peromyscus leucopus noveboracensis*)

By Irving E. Hampe

The white-footed mice are among the most common and most widely distributed mammals in North America. The genus, *Peromyscus*, includes more species and geographic races than any other genus of North American mammals. *Peromyscus leucopus noveboracensis* is found in the Upper Austral and Transition zones of the Eastern United States and Canada, extending from Nova Scotia to central Minnesota, thence south through the humid parts of Nebraska and Kansas, and eastward to the Atlantic coast, following quite closely the boundary between the Lower and Upper Austral Zones on the south and that between the Transition and Canadian Zones on the north.

A typical specimen, from the Society's collection, measures six and three-quarter inches total length, three and one-eighth inches tail vertebrae, and thirteen-sixteenths of an inch hind leg.

The color of the pelage varies a good deal. In the adult of both sexes, the upper parts are usually dark brown with a yellowish tinge, slightly darker along the median line from the shoulders to the base of the tail. In some specimens I have trapped, the median line is almost black. There is some black about the eyes



and at the base of the whiskers. The tail is sharply bicolor, blackish above and white below. The feet and under parts are pure white. Immature specimens are a mixture of black and gray on the upper parts, with the median line almost completely black, with the under parts and feet white, and the tail blackish above and white below.

The food of the white-footed mice consists of seeds, nuts, snails, insects, and the flesh of dead animals. In several instances they have been observed eating the eggs and young of birds. All of the specimens in my collection were caught in traps baited with meat. They store seeds and nuts for the winter. I have trapped several of these mice at my bird feeders during the winter months. They are rather a nuisance because they carry away all the food they cannot eat and leave none for the birds.

This species breeds from early spring until fall, and evidently produces three or four litters. The litters contain from three to seven young. A litter of four young was found in a cabin at Glenartney, Maryland, in April, 1935. They build a bulky nest of any soft material available. The nest may be in a burrow, under a log, or in an abandoned bird nest. The use of bird nests has been observed many times by me in the Patapsco State Forest Reserve. In one particular case, the nest of a White-eyed Vireo was appropriated as soon as the young birds had flown. I had returned expecting to collect the nest when I discovered that a mouse was using it to raise a family of four. The nest was discovered on the ground the following week, ripped apart.

The enemies of these mice are many. They fall prey to the hawk, owl, bluejay, and shrike among the birds, to the mink, weasel, skunk, fox, and shrew among the mammals, and also to snakes. When trapping the white-footed mice, it is not unusual to find only part of the carcass left in the trap. This is usually the result of the work of shrews. Occasionally a mouse is found with its skull ripped open while the rest of the animal is not disturbed. This may be the work of mink or weasel.

Individuals of this genus have been known to sing a prolonged and musical song somewhat similar to the notes of a canary.

The white-footed mice make very interesting pets and will eat readily in captivity. They are beautiful little creatures and their habits are of sufficient interest to gain our consideration. However, they are not of much economic importance since they usually live in the woods instead of open fields, so that the damage they do to crops is not great. (The blame lies mostly with the meadow mouse, *Microtus*).

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#### NOTES

##### Meetings at the Society

June 4 - Talk by Mr. Andrew Goss, "Birds of the Families of Woodpeckers, Crows and Jays. Picidae and Corvidae."

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June 11 - Talk by Mr. T. Milton Oler, Sr., "Making Plaster Casts of Natural History Specimens."

June 18 - Talk by Mr. John B. Calder, "Fossils and How to Preserve Them."

June 25 - Talk by Mr. Edward Crosby, "Heat and Electrical Phenomena in Minerals."

#### Junior Meetings

June 1 - Talks by Francis Wise, "Calcite Deposits of Woodberry", John Gleim, "Spiders", and Robert Hurder, "Cockeysville Minerals."

June 15 - Talk by Mr. Elra M. Palmer, "Reorganization Program."

#### Exhibits

June 7 to July 6 - Branch 7, Enoch Pratt Library, "Minerals."

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#### Field Work for This Summer Season

Field work comprises seventy per cent of the Society's activities. Throughout the year various departments are constantly in the field. With the coming of summer and vacation time all of the departments are making special plans for extensive field work.

Some departments are planning expeditions to cover a period of two to three weeks, while others are preparing to make special studies which cannot be made any other time.

One of the most outstanding of the former is being made by the Department of Paleontology. For the past four years this department has been making special studies of the Miocene deposits of Maryland. This year the department will start its work on the Eocene deposits of Maryland.

Another is that of the Department of Marine Research which will launch a new marine project. This is the "Bentharium", an undersea tank from which observations and photographs of marine life can be made. This work promises to reveal much new data and matter relative to the life of fish and other marine forms.

Many important facts and discoveries are expected from this summer's work.

Edmund B. Fladung

THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

RESEARCH REPORT

1950

BY

ROBERT H. BROWN

AND

WILLIAM R. HAYES

AND

ROBERT W. WOOD

AND

ROBERT W. WOOD

RESEARCH REPORT

ON THE

REACTIVITY OF

ALIPHATIC

PEROXIDES

IN

THE

REACTION

WITH

HYDROGEN

PEROXIDES

AND

HYDROGEN

PEROXIDES

6.73  
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*The Natural History*

*Society of Maryland*



**BULLETIN**

Vol. V No. 11

JULY, 1935

\$1.00 a Year

**COBBS ISLAND AND THE BLACK SKIMMER**

By Edmund B. Fladung

There is a desire in almost every naturalist to visit certain places that have been visited and where studies have been made by naturalists at previous times. Such a place depends upon the branch of Nature in which the individual is interested, and to a lover of birds such a place is Cobbs Island. In looking over an old register, the possession of "Captain" George Cobb, who was then Game Warden of the island, I noted many well known names of bird lovers therein, notably Audubon and Chapman.

We left Baltimore, June 24, 1932, by automobile and arrived at Oyster, Virginia, the following day at 9:30 P.M. "Captain" Cobb who was aware of our coming provided us with a launch to convey us and our equipment to the island, on which we arrived an hour later.

Cobbs Island is one of a series of small islands off the coast of Virginia about eight miles from the mainland. To the north is Hog Island and to the south are Wreck Island and Smith's Island.

Cobbs Island is a sandy, flat plain about four miles long and at its greatest width two miles wide, with marshes along the west coast. With the exception of marsh grass, there was only one bush upon the island. There was no water supply, excepting the rain water which was caught in barrels, and could only be used for washing purposes. The drinking water had to be brought from the mainland.

With the exception of the United States Coast Guard, the only other inhabitant of the island was "Captain" George Cobb, the Game Warden, who maintained a sort of hotel for many years, which was destroyed by fire and was replaced with a less pretentious building to accommodate sportsmen and naturalists.

The island was settled by Nathan Cobb about a century ago. It seemed from the story told by "Captain" Cobb, that the family tried to eke out a living by evaporating the sea water for its salt. This venture proved unsuccessful. Nevertheless some part of the family continued to reside there and finally established a hotel for sportsmen, who found a paradise of game and fish. With these came the egg and plume hunters, who almost exterminated the Royal and Caspian Terns.

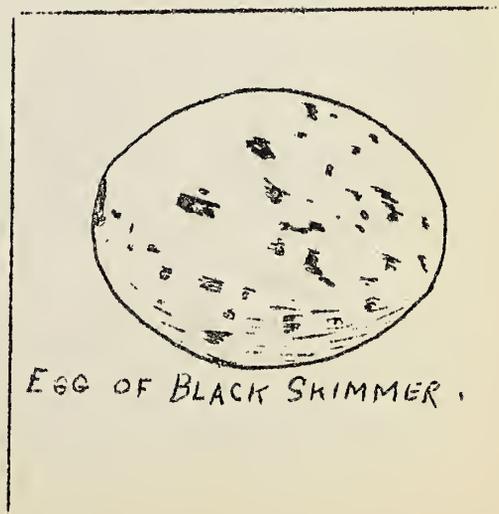
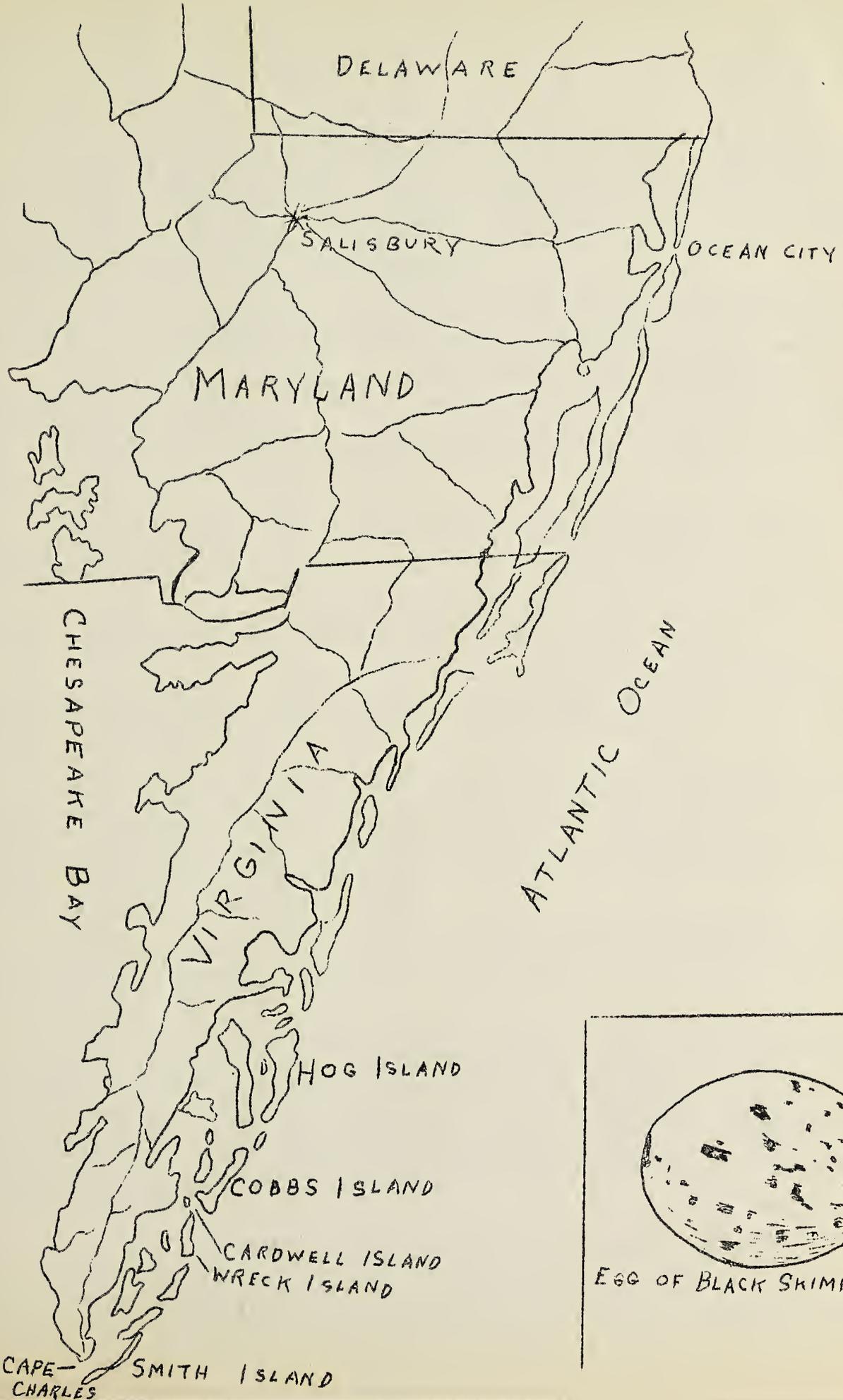
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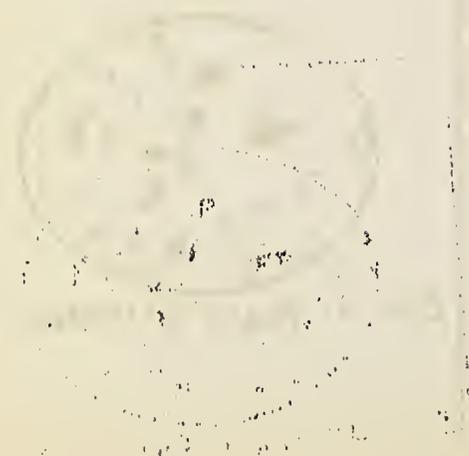
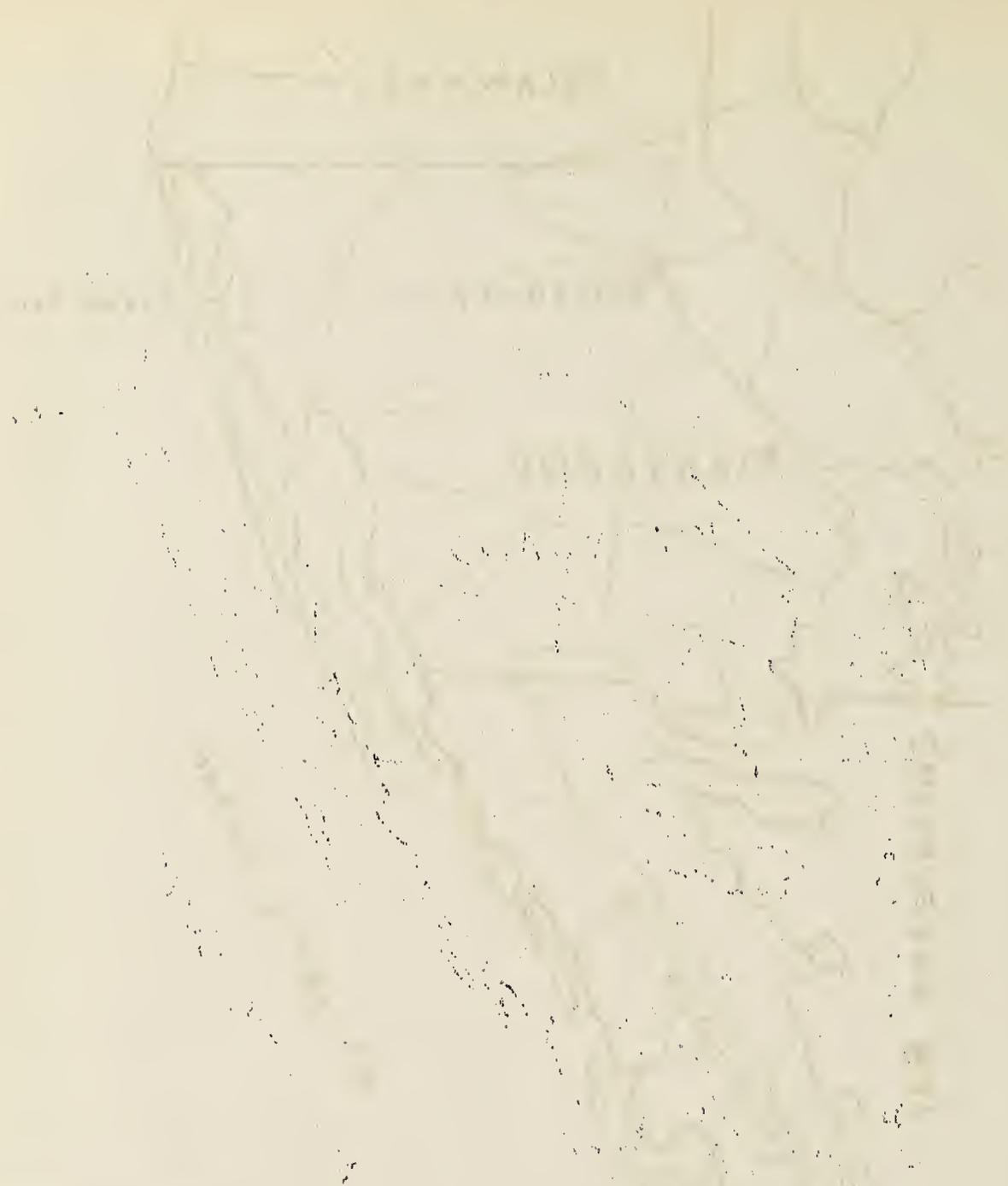
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EGG OF BLACK SKIMMER.



BRUSSELS  
 1850  
 1851  
 1852  
 1853  
 1854  
 1855  
 1856  
 1857  
 1858  
 1859  
 1860

The object of our trip was to study and photograph the gulls, terns, and black skimmers, but previous to our arrival a storm had destroyed the entire nesting colony of the laughing gulls and terns, so our entire study was directed to the black skimmers (*Rynchops nigra*) which were at the height of their breeding season.

The ornithological history of the island has been a stormy one. Gale-driven seas swept over it, not only destroying the nests of beautiful, graceful birds, but continually reducing the size of the island. It has been estimated that two miles of the island's length has thus been reduced. During the storm of August 23, 1933, the warden, George Cobb, lost his life.

There was one colony of skimmers on the north end of the island, but by far the greater colony was on Cardwell Island, which was, no doubt, at one time a part of Cobbs Island, and which is now separated by a narrow inlet. Here we found the birds by the thousands. Everywhere we walked were nests, sometimes so close together that we had to be careful not to tread upon them. The nests were found in every stage of development from the depression just scooped out of the sand, to the young chicks.

The nest of the black skimmer is a hollow depression from four to five inches in diameter and about one inch in depth. There were from one to five eggs in each nest, or the same number of young.

The eggs are cream white and buff white, with many chocolate spots. They are about 1.75 X 1.35 inches. (See figure).

The young leave the nests several hours after hatching and are found everywhere, but are hard to distinguish, owing to their coloration which blends in admirably with the sand.

I did not see the young fed by direct contact with the parent. The parent seemed to drop the food from overhead, sometimes from quite a distance, and the young would follow the parent and pick it up as does a baby chick. How long this method of feeding is continued I cannot say, as our stay was not long enough and there were no young over seven days of age.

The old birds arrive from the south sometime during the month of May, but egg laying does not commence until the latter part of June or first part of July.

The adult is not a graceful bird upon land. The legs are short, giving the creature a rather squatty appearance. The neck is rather long and the tail somewhat short. The bill is black with a red base, and is uneven, the lower mandible being longer than the upper. But in flight the bird is very graceful. It is truly an imposing sight with its long, black topped wings and underneath a pearly white, as it flies rapidly skimming the water for food, while uttering its bark-like call.

Upon our arrival hundreds of these birds took to wing, with their loud barking cry, always flying directly at the intruder and then swerving around to the water's edge. After we were settled in our blinds, the birds readily returned. They do not stay for any

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...the third is the fact that the ...

...the fourth is the fact that the ...

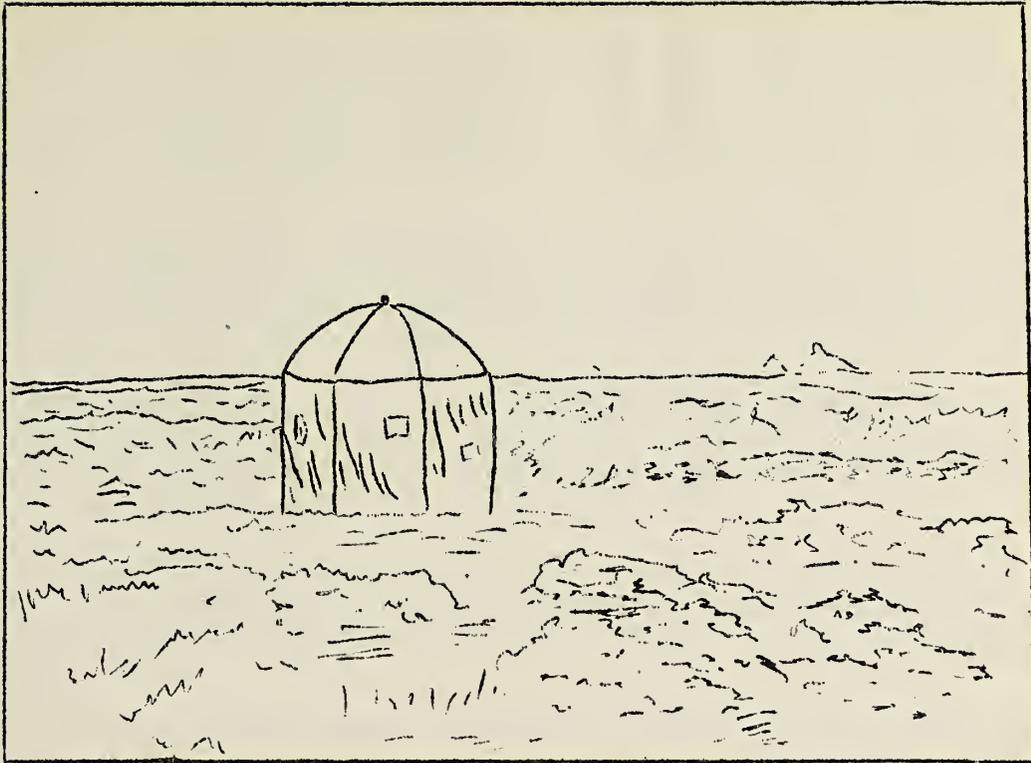
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...the sixth is the fact that the ...

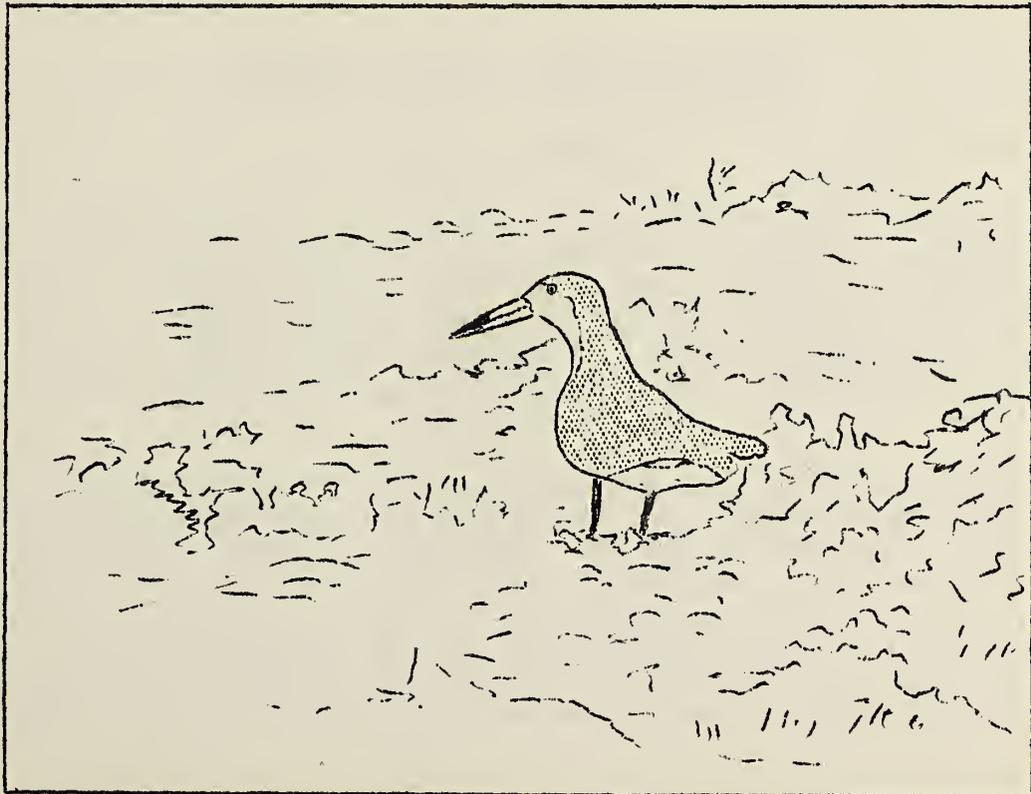
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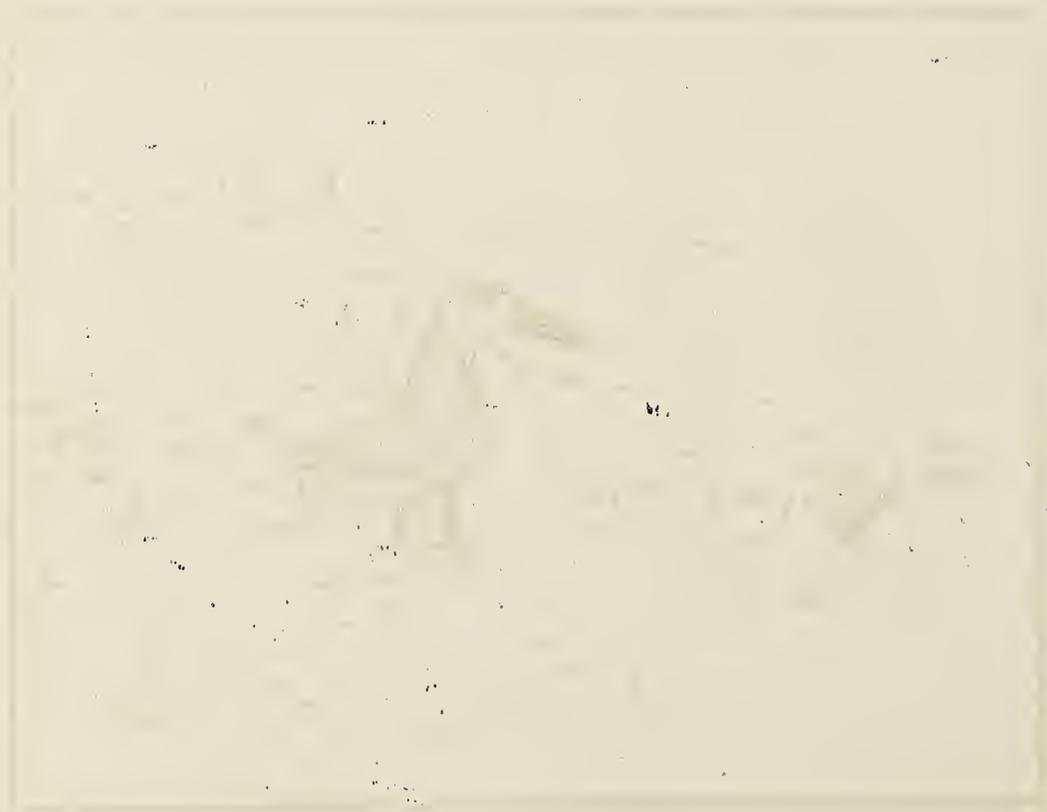
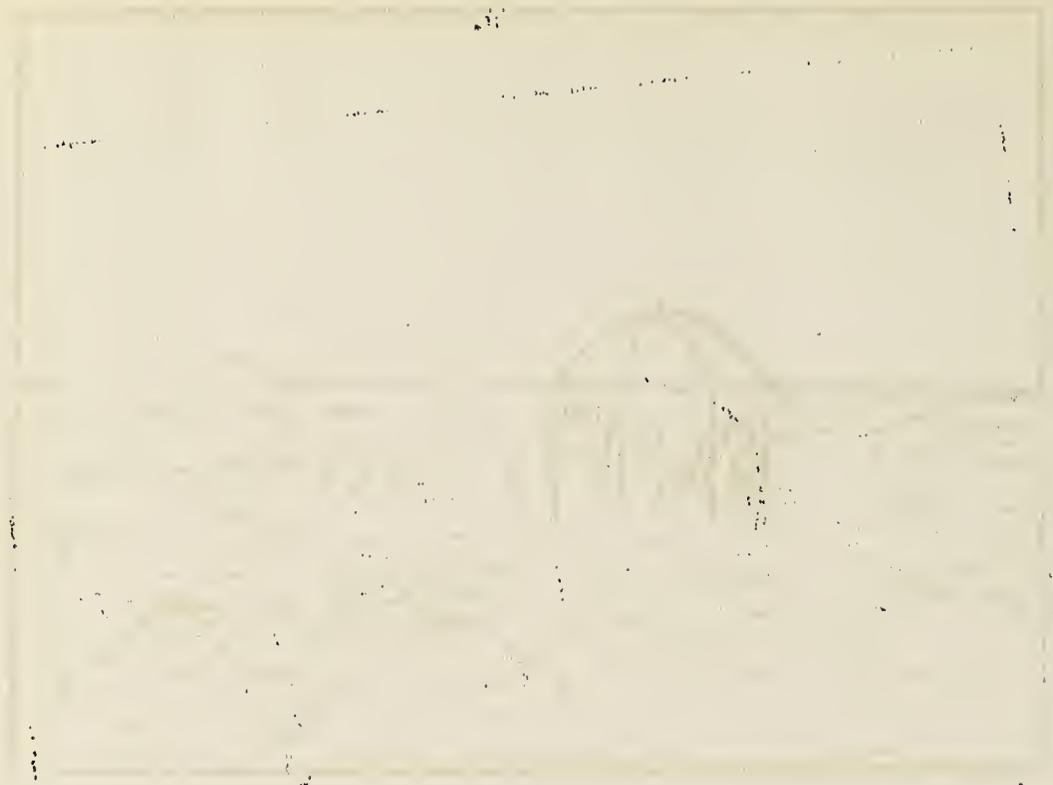
...the ninth is the fact that the ...



Bird Blind



Black Skimmer



length of time on the nest. I should say about five minutes at the longest. They then fly away and return after five or six minutes, repeating the performance. This brief period on the nest may have been owing to the heat of the day. The birds may remain longer upon the nest when the temperature is lower. There was never more than one bird at a nest at any time.

When taking off, the bird does not fly from the nest at once but seems to glide for some distance before taking to flight. In returning to the nest it always alights some distance from the nest and then, as it were, glides to it.

Flying was always accompanied with a barking noise, even when the bird was not frightened. When disturbed, the nearest part of the colony would all take to flight and then the noise would become deafening.

In feeding, the birds would fly close to the surface, every now and then dipping their long bills into the water, allowing the water to drain from both sides of the mandibles, thereby retaining the food.

When at rest the birds seemed to squat close to the ground, facing the wind.

All of our observations and photographs were made from the blind or tent here shown. Without this it would have been impossible to accomplish much.

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HABENARIA GRANDIFLORA (BIGEL)  
(LARGE PURPLE FRINGED ORCHIS)

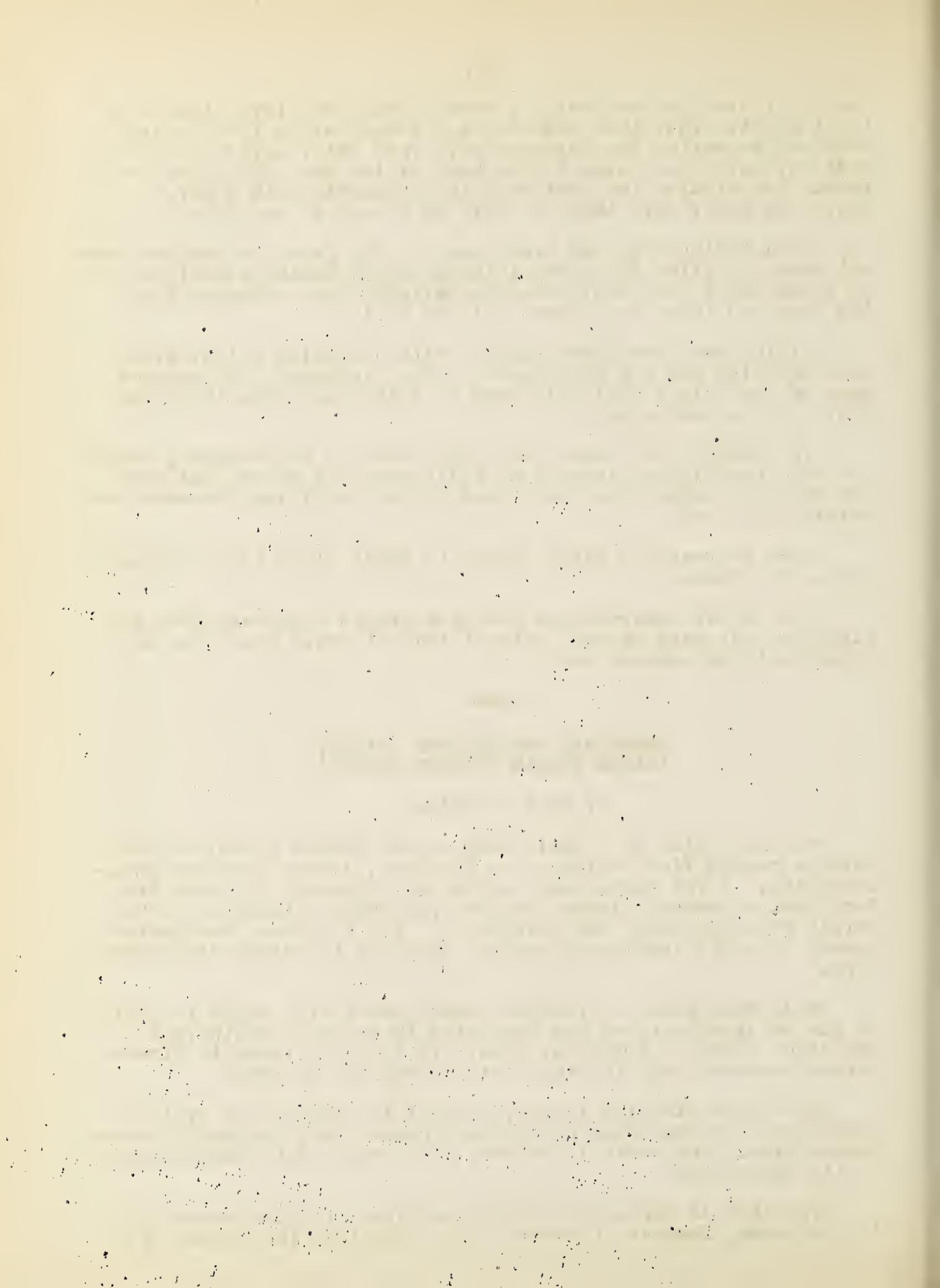
By Earl H. Palmer

One day while on a field trip around Owings Mills, we entered a marshy field which, from the road, looked drab and uninteresting. A few steps were sufficient, however, to prove the fact that a cursory glance does not pay while botanizing. The Purple Fringed Orchis was everywhere. All together, we counted upward of sixty specimens, ranging from ten to thirty-six inches high.

This most regal of fringed orchis has a wide range in spite of its retiring nature; New Brunswick to Ontario, westward to Michigan, south to North Carolina. It is to be found in flower during June and July in rich, moist woods and meadows.

The large clasping leaves, several in number, are oval or lanceolate; between four and twelve inches long, and one to three inches wide. The stalk is grooved and covered with small leaves on its upper half.

The stem is capped by a large purplish or lilac raceme of long spurred, feathery blossoms. The beautiful fan spread lip

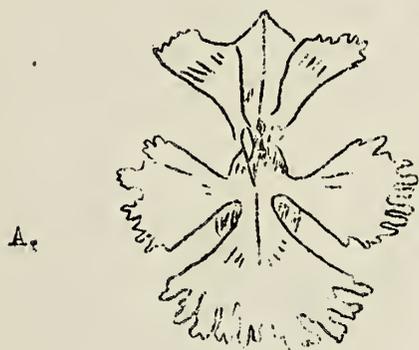


has three divisions and varies in width from a half inch to an inch. An examination of sketch "A" will show that the lower division of the lip is grooved. The two side divisions of the lip, as Grey once remarked, "aid in hindering approach" from those directions. Naturally the visiting insect will land on the middle division, walk up the groove, which leads directly to the nectary within the spur.

"The two anther cells are widely separated, but little divergent; their lower ends projecting strongly forward, bring the naked discs just into line within the orifice of the nectary." (1)

The dainty fluttering blossoms with their bracts, green and pointed, their long spurs making a loose feathery-like raceme, suggested to Baldwin, "a flock of birds struggling to get a foot hold on the same branch." Nothing is more descriptive of this beautiful plant.

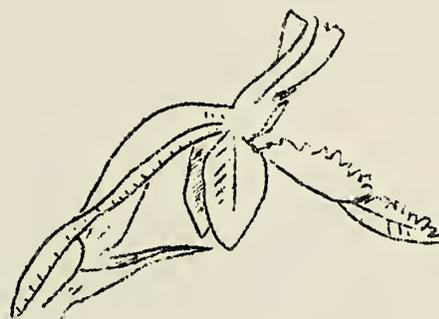
(1) Gibson, Wm. H. - "Our Native Orchids".



A.

Natural Size

Front View

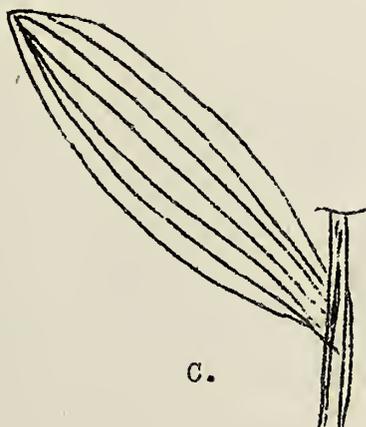


B.

Natural Size

Side View

*Habenaria  
grandiflora*



C.

x 1/2

Leaf and Stem

The first part of the paper deals with the general principles of the theory of the structure of the cell wall. It is shown that the cell wall is a complex structure, consisting of a number of layers of cellulose fibers, which are arranged in a regular, repeating pattern. The thickness of the cell wall varies from a few microns to several tens of microns, depending on the type of cell and the stage of its development.

The second part of the paper is devoted to a detailed study of the structure of the cell wall of a certain type of plant cell. It is shown that the cell wall of this cell is composed of a number of layers of cellulose fibers, which are arranged in a regular, repeating pattern. The thickness of the cell wall varies from a few microns to several tens of microns, depending on the type of cell and the stage of its development.

The third part of the paper is devoted to a detailed study of the structure of the cell wall of a certain type of plant cell. It is shown that the cell wall of this cell is composed of a number of layers of cellulose fibers, which are arranged in a regular, repeating pattern. The thickness of the cell wall varies from a few microns to several tens of microns, depending on the type of cell and the stage of its development.

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Fig. 1. Cell wall of a certain type of plant cell.



Fig. 2. Cell wall of a certain type of plant cell.



Fig. 3. Cell wall of a certain type of plant cell.

NOTESMeetings of the Society

- July 2 - Talk by Mr. Elra Palmer - "Geologic Time and Paleontological Problems."  
 July 9 - Talk by Mr. Harry Putsche - "The Bee." Illustrated.  
 July 16 - Talk by Mr. Joseph White - "Fish of the Family Cyprinidae." Illustrated.  
 July 23 - Talk by Mr. Earl H. Palmer - "Ferns, Their Growth and Development." Illustrated.  
 July 30 - Talk by Mr. Gilbert C. Klingel - "The Bentharium."

Special Lecture Courses

- July 15, 22, and 29 - On Mineralogy by Mr. Walter E. Price, Jr.  
 July 15, 22, and 29 - On Photography by Mr. Edward McColgan and Mr. Edmund B. Fladung.  
 July 17, 24, and 31 - On Botany by Mr. John B. Egerton.  
 July 17, 24, and 31 - On Public Speaking by Mr. Elra M. Palmer.

Junior Meetings

- July 6 - Talk by Mr. Elra M. Palmer - "Geologic Times and Paleontological Problems."  
 July 20 - Talk by Mr. Earl H. Palmer - "Short History of Botany and Some Special Plants."

Exhibits

- July 15 - August 3 - Exhibit of two scale models of Dinosaurs, at the Enoch Pratt Library, Central Branch.  
 July 1 - 31 - Exhibit of Indian Artifacts, at Enoch Pratt Library, Branch #7.  
 July 10 - August 9 - Exhibit of Sea Shells, at Enoch Pratt Library, Branch #12.  
 July 18 - August 17 - Exhibit of Nature Photographs, at Enoch Pratt Library, Branch #12.

Special Meetings

- July 13 - Trustees Meeting; Staff Appointments, Mineralogy, Walter E. Price, Jr., Curator, A. Llewellyn Jones, Research Associate; Paleontology, Elra M. Palmer, Curator; Botany, John B. Egerton, Curator; Marine Research, Gilbert C. Klingel, Curator; Entomology, Dr. John A. Frisch, Curator, F. Stansbury Haydon, Research Associate; Herpetology, Harry C. Robertson, Curator; Ornithology, Irving E. Hampe, Curator; Archaeology, Richard E. Stearns, Curator; Education, Elra M. Palmer, Director; Publication, Herbert C. Moore, Editor; and Library, Earl H. Palmer, Librarian. The President is Chief of the Staff.  
 July 27 - Meeting of entire Staff.



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The Natural History



Society of Maryland

**BULLETIN**



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Vol. V No. 12

AUGUST 1935

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BIRD BANDING

By Edward McColgan

Ornithologists have long realized that the mere study of collected specimens could not give a satisfactory knowledge of bird life, but study of the living bird was difficult on account of its powers of sustained flight and especially on account of the habit of seasonal migration common to so many species.

One of the great difficulties was the identification of the individuals. A bird or a flock would be observed at a certain point, disappear, and others of the same species would be noted at another place, but was this a continuation of the same observation or was this an arrival of an entirely different group? Here was a creature covered with feathers, which were moulted at least once a year, so that marking the feathers would be useless. A mark on beak or claws would be too small, and if put on by branding or like means, would cause suffering. The great naturalist Audubon hit on the idea of attaching tiny silver rings to the birds' legs. These fitting like tiny bracelets, would cause no suffering, and if marked, furnish a permanent proof of identity. A Stork marked by such a ring, in Berlin, about 1880, returned the following year with a second ring inscribed "Bombay, India, sends greeting to Berlin".

As time went on the plan was extended and, when the bird protection law was passed, this work was placed in the hands of the Department of Agriculture. It is carried on by institutions and individuals, including members of our Society, to whom Federal and State permits are issued. Without these permits, bird trapping is illegal. Should any one find dead, or accidentally capture a banded bird, he or she should send its number and letter to the Bureau of Biological Survey, Washington, D.C. This also applies to banded game birds shot while hunting.

Among the results obtained, the following are noted in, "A Decade of Bird Banding" by F. C. Lincoln; Smithsonian Reports, 1932.

The fact was discovered that there is an east and west migra-



tion in addition to the ordinary north and south one. Some examples:

A Duck Hawk banded at Mohonk Lake, New York, was retaken at Grand Island, Nebraska; a Coot banded at Green Bay, Wisconsin, was killed at Essex, Connecticut; a Junco banded at Crystal Bay, Minnesota, was retaken at Demarest, New Jersey; while another Junco banded at Paoli, Pennsylvania, was retaken at Jamestown, North Dakota. Two Purple finches, one banded at Sault Ste. Marie, Michigan, the other at Katona, New York, were retaken together at Milton, Massachusetts.

A number of instances of long distance flights were proved. Two Great Blue Herons banded at Waseka, Minnesota, were retaken in Central America. A Pintail Duck banded at Ellenwood, Kansas, was retaken at the mouth of the Kober River, 3300 miles away. A Blue-wing Teal banded at Kearney, Nebraska, was retaken at Santa Marta, Columbia, 2600 miles. A Duck Hawk banded at Kings Point, Yukon Territory, was killed at Duchesne, Utah, 2000 miles. A Purple Finch banded at Hyde Park, Massachusetts, was retaken at Nacogdoches, Texas, 1400 miles, and a Mourning Dove banded at Fort Riley, Kansas, was killed at Apipiluco, Mexico.

And from the same article we have an account of a most interesting discovery; that of the route of the Arctic Tern. This was for a long time one of the mysteries of ornithology. The bird's breeding range is circumpolar, while in winter it has been found south to the Antarctic continent, but it is practically unknown on the North American coast south of Long Island. In 1927-28, Dr. Austin banded several hundred of these terns on the coast of Labrador. One was recovered on the west coast of France, another from Natal, South Africa. The last had been banded as a chick, and was less than four months old when found, and it had flown 8000 miles at least. Another return showed that an Arctic Tern banded in Maine was found in southern Nigeria. It now appears that the American birds cross the ocean and join their European fellows, then follow the coasts of Europe and Africa to their winter quarters in the Antarctic regions.

There have also been some remarkable cases of longevity among the smaller birds which were only supposed to live a few years. "Bird Banding Notes", a publication of the Biological Survey, gives the following instances:

A Wren-Tit, banded March 25, 1925, by E. D. Clabaugh, in Strawberry Canyon, near Berkeley, California, was last observed February 21, 1934 - ten years old, at least.

A Bronze Grackle, banded June 26, 1925, at Indianapolis, Indiana, by S. E. Perkins, III, was found dead at Riverside Park, Indiana, March 21, 1934 - nine years at least, probably ten.

A Purple Finch, banded at Northeast Harbor, Maine, on June 21, 1924, by Mrs. Eleanor S. Morgan, was trapped and released at Bar Harbor, Maine, April 28, 1933, by Mrs. Effie A. Anthony.

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A Meadowlark, banded June 14, 1926, at Ridley Park, Pennsylvania, by Mr. and Mrs. John A. Gillespie, was shot February 16, 1935, at Beaufort, North Carolina. Ten years old.

A Blue Jay, banded November 26, 1925, at Baldwin, New York, by K. W. Baasch, was found dead June, 1934. Nine years old.

There are several other records of small birds, some of which run to eleven and twelve years, the particulars of which are not available.

A small station is now being operated by the author at his home. Among the points noted so far is the great difference in the returns of the various species. Twenty-four mourning doves were banded at this station during one season and twelve returned. On the other hand, only one return was obtained, and one found dead, out of forty-eight White-throated Sparrows banded in two seasons. From one hundred and four purple grackles banded in two seasons, two returns and four reports of birds killed or found dead were obtained. The doves, it will be noticed are of a family noted for its homing qualities. Whether the other cases are to be attributed to intelligence in the bird, or to lack of affection for its old habitation is uncertain. In this connection it may be mentioned that the Blue Jay, generally considered an intelligent bird, is one of the easiest of all to trap and returns quite freely. On the other hand this may be attributed to its other quality of greediness. Certainly at some seasons it can be heard every day, but will not come near the trap, while at other times the birds will crowd into it.

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## SOME EXTINCT AND RARE BIRDS IN MARYLAND

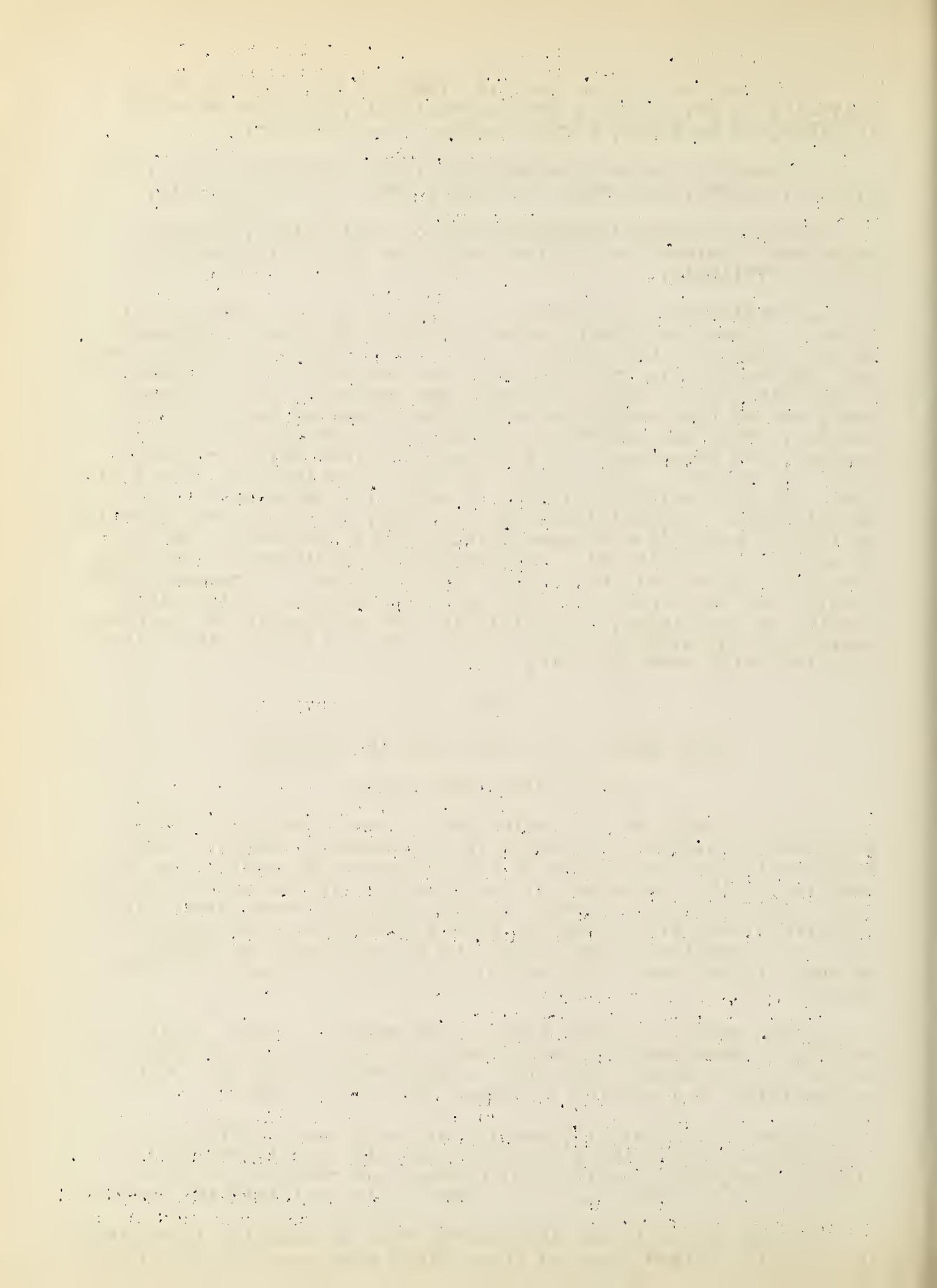
By R. Bruce Overington

The phenomena of the extinction of some species of birds is probably governed by changes in temperature, habits, enemies, food shortages, development of new and stronger species, or the changing of the contexture of the country. In the universal laws which govern change we notice intelligence and every living thing is particularly fitted for its part in existence. When changes come and a species is not adapted to the new order of things, it must either change its habits, its complex makeup, or become extinct.

Whole orders of birds have become extinct because of inability to meet changing conditions. In some cases, branches of one or more of these orders may be preserved to-day due to the adaptability of a species to change its mode of living.

Audubon (1780-1851), speaking of the Passenger Pigeon (*Ectopistes migratorius*), says that the air was literally filled with pigeons, that the light of noonday was obscured as by an eclipse, and for three days they came on in undiminishing numbers.

How different is the last record from my locality in Maryland! In the fall of 1888 three of these birds were seen and shot near



Laurel. Still later, however, in August, 1893, three others were reported by Mr. F. C. Kirkwood, as having been seen by him in the Dulaney Valley, and he also states that several flocks of 40 to 60 were seen that fall, one near Ellicott City and one in the Green Spring Valley.

In the extinction of this bird which at one time numbered millions and millions we can readily see that no matter how numerous the species, a few years only is necessary for the wane and final eclipse. If they had not traveled in mass, if their breeding range had not been so restricted, we might have this beautiful bird to-day. But without any protection from man's depredations, and without the ability to take on new characteristics in so short a time, it was obvious that the Passenger Pigeon should pass away.

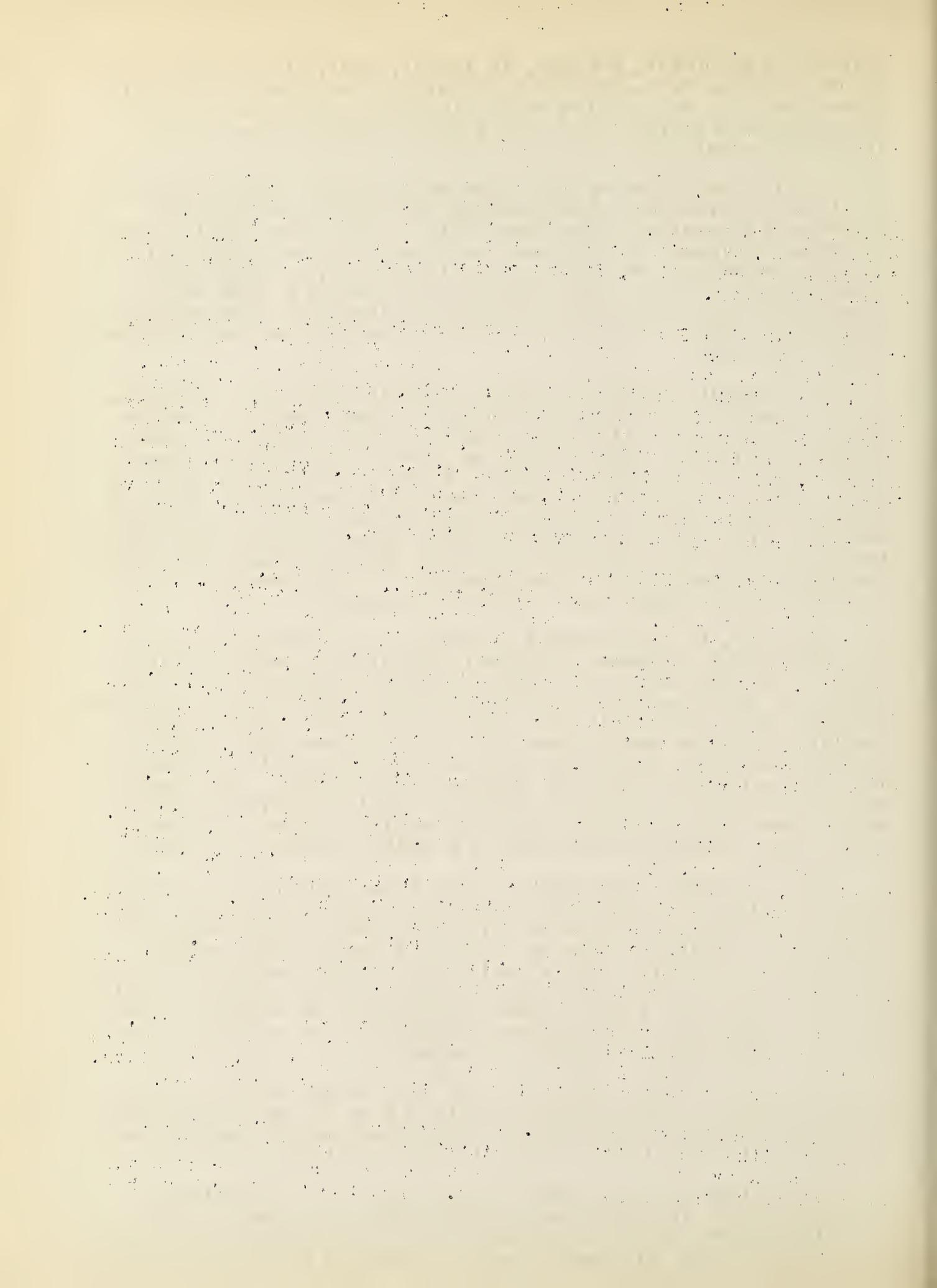
The Carolina Paroquet (*Conurus carolinensis*) had a very beautiful plumage for which it had to pay a heavy penalty. Besides this, its food was entirely vegetable - cockle burs, beechnuts, pawpaw, cultivated fruit and tender grain. One could not stand idly by and see his orchard robbed of every bud, or his field of maize being destroyed by a whole flock of these birds. Also the birds had the habit of hovering about when any member of the flock was shot, which made it easier to shoot others. These birds once inhabited the whole southwest, and when food was scarce they have been taken as far north as New York State. They have not been recorded from Maryland for over seventy years.

Formerly, the Wild Turkey (*Meleagris gallopavo*), as well as the Ruffed Grouse (*Bonasa umbellus*) inhabited my county (Prince Georges) in Maryland. From early accounts I assume that with the opening of the country the Wild Turkey naturally became more scarce, although very probably it was never a very common bird in this locality. But the Ruffed Grouse was not uncommon thereabouts. Several bad years, incursions by natural enemies, and the cutting of much timber have practically obliterated it to-day. True there may be a few pairs left, and some may occasionally find their way in from other sections. Notwithstanding, I have not heard of one bird having been seen here for quite a number of years.

Many sportsmen think that no more birds will become extinct, but to my mind it is only the beginning. Which will be the next it is hard to say. That there will be a next I am thoroughly convinced. Possibly it may be one of our larger shore birds; again it may be a kite with a restricted breeding area. Our ducks, fortunately, raise large broods and manage to hold their own fairly well in spite of losses. With the draining of marshes, a few years of drought, and the automatic shotgun, they may also dwindle down to a point where there is no recovery.

Other causes have helped to make many of our birds scarce. The automobile so quickly takes one to out of the way places where shooting may be had. Also some people disregard the hunting laws, and others shoot wantonly, trying to hit everything they see.

In the last few years game refuges have been established. The State itself is raising and distributing game birds. The Biological Survey has been checking up on the breeding ranges and the numbers of the different species. Then too the laws have be-



come more stringent, and this is as it should be, for there is not much time to lose if the rarer species are to be preserved.

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## MINERALS OF THE BARE HILLS COPPER MINE

By Charles W. Cstrander

Many interesting minerals have been found at the well known Bare Hills Copper Mine, located on Smith Avenue about one mile east of Old Pimlico Road. This mine was in operation, somewhat intermittently, from the middle of the last century up to the early 1900's.

The ore-bearing rock is meta-gabbro (hornblende gneiss), bordering on the Serpentine rock of Bare Hills. Little remains to show that the mine once existed except the extensive dumps now badly weathered, the water-filled shafts, and foundations of the old engine house.

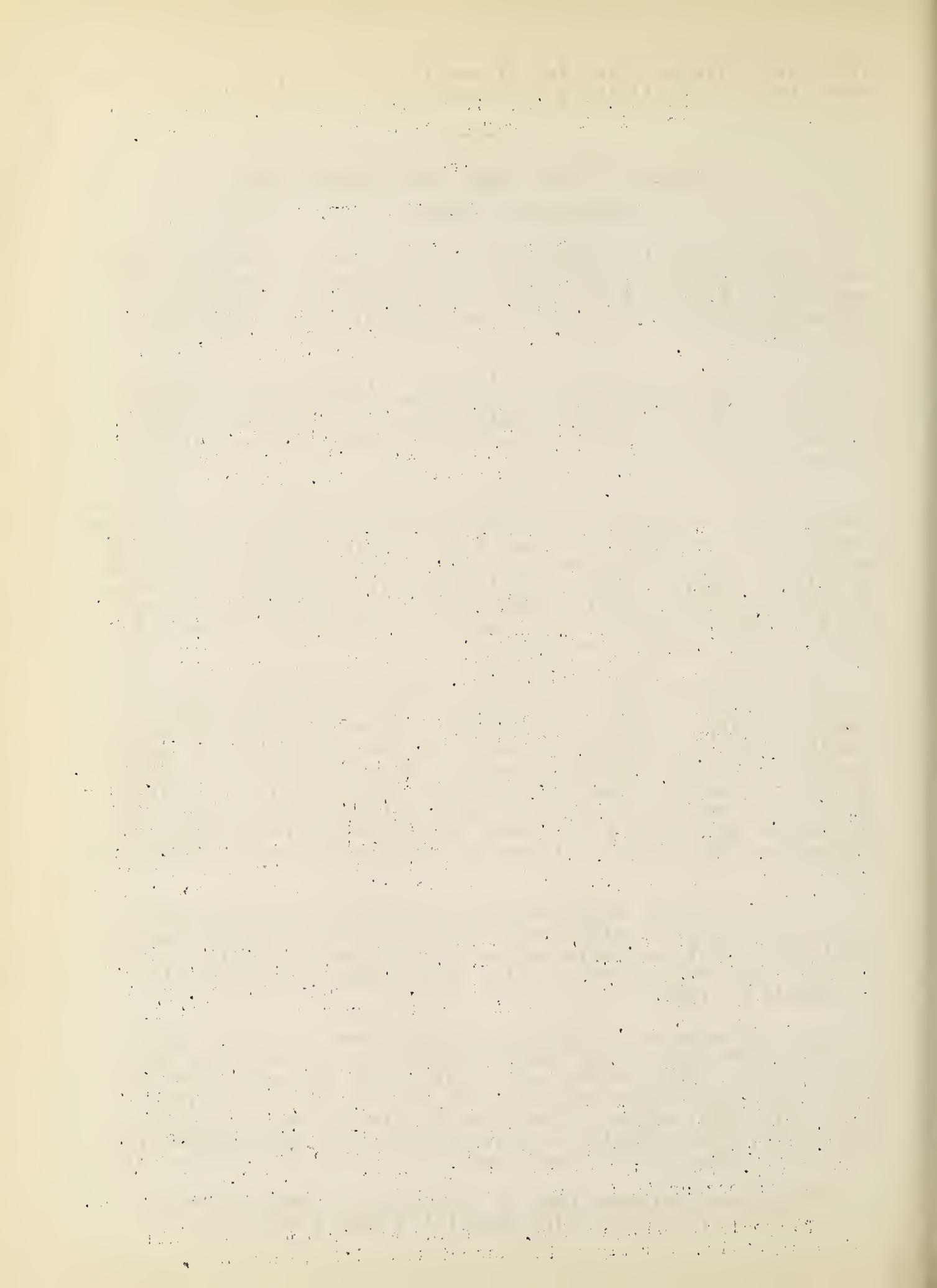
Of the ore minerals collected at this location the most important is Chalcopyrite ( $\text{Cu Fe S}_2$ ), which occurs in brassy yellow masses, the specimens now found in the surface dump being badly weathered. As yet we have found no crystals of this mineral at the mine. Bornite ( $\text{Cu}_5 \text{Fe S}_4$ ) is found in a massive state often associated with the Chalcopyrite. It is easily recognized by the iridescent coating on the surface of the mineral from which the name "peacock ore" originated.

Sometimes one sees a soluble coating of a bluish green mineral surrounding the Chalcopyrite. This is Chalcantite ( $\text{Cu SO}_4 \cdot 5\text{H}_2\text{O}$ ), a product of the oxidation of the former minerals. Azurite ( $2\text{Cu CO}_3 \cdot \text{Cu(OH)}_2$ ), another mineral formed by the oxidation of copper, is found but rarely. It occurs as a blue stain on rock. Malachite ( $\text{CuCO}_3 \cdot \text{Cu(OH)}_2$ ), which is easily recognizable by its dull green color, is also found staining the rocks. It can be commonly seen on the rocks in the small stream which runs through the mine dumps. It was in solution and was deposited on the rocks.

Magnetite ( $\text{FeO} \cdot \text{Fe}_2\text{O}_3$ ) occurs in heavy black crystalline masses and in small octahedral crystals. This mineral is easily identified by its magnetic properties. Limonite ( $\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$ ) is found as a rusty brown coating on the ores of which it is an oxidation product.

Two minerals of the Amphibole group seem to be the most prevalent material on the dump, the reason for this being that they comprised the greater part of the waste material from the mine. The most common of this group is Actinolite ( $2\text{CaO} \cdot 5(\text{Mg}, \text{Fe})\text{O} \cdot 8\text{SiO}_2 \cdot \text{H}_2\text{O}$ ) which is found in greenish to brown lamellar masses (1). Much similar to this is Tremolite ( $2\text{CaO} \cdot 5\text{MgO} \cdot 8\text{SiO}_2 \cdot \text{H}_2\text{O}$ ) which occurs in the same form but has a lighter brown color.

Plagioclase feldspar (Na, Ca feldspar) is found in small white crystals, usually being associated with Hornblende.



In small radiating pistachio colored crystals in Feldspar and Calcite is found Epidote ( $4CaO.3Al_2O_3.6SiO_2.H_2O$ ). Small crystals of black Tourmaline are also found on the dump (Complex silicate). Chlorite (Complex silicate) is found as a decomposition product of the silicates. Garnet (Almandite) occurs in minute red crystals in the feldspar. Stilbite ( $2CaO.Na_2O.3Al_2O_3.26SiO_2.24H_2O$ ) occurs rarely as a drusy lining of rock cavities.

(1) The mineral in question has been observed in other collections under the labels of Gunningtonite or Bronzite-Enstatite, but optical analysis has shown it to be Actinolite. So far no trace of the other two minerals mentioned above has been found.

(A "History of the Copper Mine at Bare Hills" will be found in the May, 1935 Bulletin).

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#### NOTES

##### Meetings at the Society

August 6 - Talk by Mr. Edmund B. Fladung, "The Organization of the Society."

August 13 - Talk by Mr. W. Bryant Tyrrell, "Familiar Birds." Illustrated.

August 20 - Talk by Dr. John A. Frisch, S.J., "The Paramecium." Illustrated.

August 27 - Talk by Mr. Frank Yingling, "Mythological Fish."

##### Special Lecture Course

August 5 and 12 - Mineralogy, by Mr. Walter E. Price, Jr.

August 5 and 12 - Photography, by Mr. Edward McColgan and Mr. Gilbert C. Klingel.

August 7 and 14 - Botany, by Mr. John B. Egerton.

August 7 - Public Speaking, by Mr. Elra M. Palmer.

##### Exhibits

August 3 to 31 - Exhibit of Models of Dinosaurs at the Enoch Pratt Library, Branch 7.

##### Junior Meetings

August 3 and 17.

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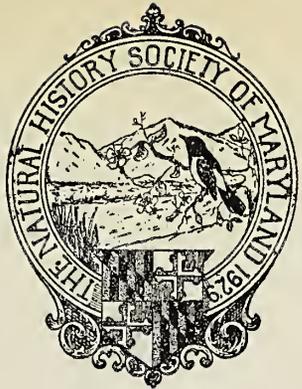
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*The Natural History*

*Society of Maryland*

**BULLETIN**



Volume VI

SEPTEMBER, 1935

Number 1

THE BLACK WIDOW SPIDER

By Elmo Masters

The Black Widow was first described from America in 1775 by Fabricus as *Aranea mactans* (now known as *Latrodectus mactans*). It is one of a group of spiders, notorious in all ages, in whatever part of the world they may occur, for the poisonous nature of their bite.

In southern Europe the well known Malmigniatle (*L. malmigniatu*s) is a member of this group; in southern Russia the "Black Wolf" (*L. lugribus*), known to the Tartars as the Kara-Kurt is found; and in New Zealand there is a form known to the natives as Kapito, to distinguish it from the common harmless Spider, Punga-were-were.

According to Dr. C. Hart Merriam, the Northern Mewan Indians of California refer to the Black Widow as "Po-ko-moo - the small black spider with a red spot under his belly is poison. Sometimes he scratches people with his long fingers and the scratch makes a bad sore." Dr. Merriam also states that these Indians crushed the body of the spider and used it to poison the tips of arrows.

Some students of spiders have been inclined, however, to accept these general beliefs as myths. F. P. Cambridge (1892) believes that the idea that the Black Widow is poisonous is due to fear inspired by the strongly contrasting colors of the species.

Riley and Howard (1889) in a series of articles on the Black Widow arrive at no definite conclusion, but state - "Admitting in its fullest force the argument that in reported cases the spider has seldom, if ever, been seen by a reliable observer to inflict the wound, we consider the fact that species of *Latrodectus* occurring in such widely distant localities as S. Europe, the Southern United States and New Zealand are uniformly set aside by the natives as poisonous, when there is nothing especially dangerous in their appearance, is the strongest argument for believing that these statements have some verification in fact." In this same series Riley and Howard accept the European form *L. malmigniatu*s as congeneric with *L. mactans* and base most of their discussion on



this species, and they accept the statement of the Rev. J. Blackwall (Experiments and Observations on the Poison of Animals of the Order Araneidae) on reports of fatal results of the bites by *L. malmignatus* "as amusing fictions in the natural history of Araneidae."

As late as 1911, J. H. Comstock makes no definite statement about the venomous nature of the bite of *L. mactans* but apparently he does not take too seriously the stories of its poisonous effects.

In 1926, Bogin states that 150 reports of poisonous spider bites had been recorded by thirty-three physicians in the United States and in 1932 he lists a total of 380 cases.

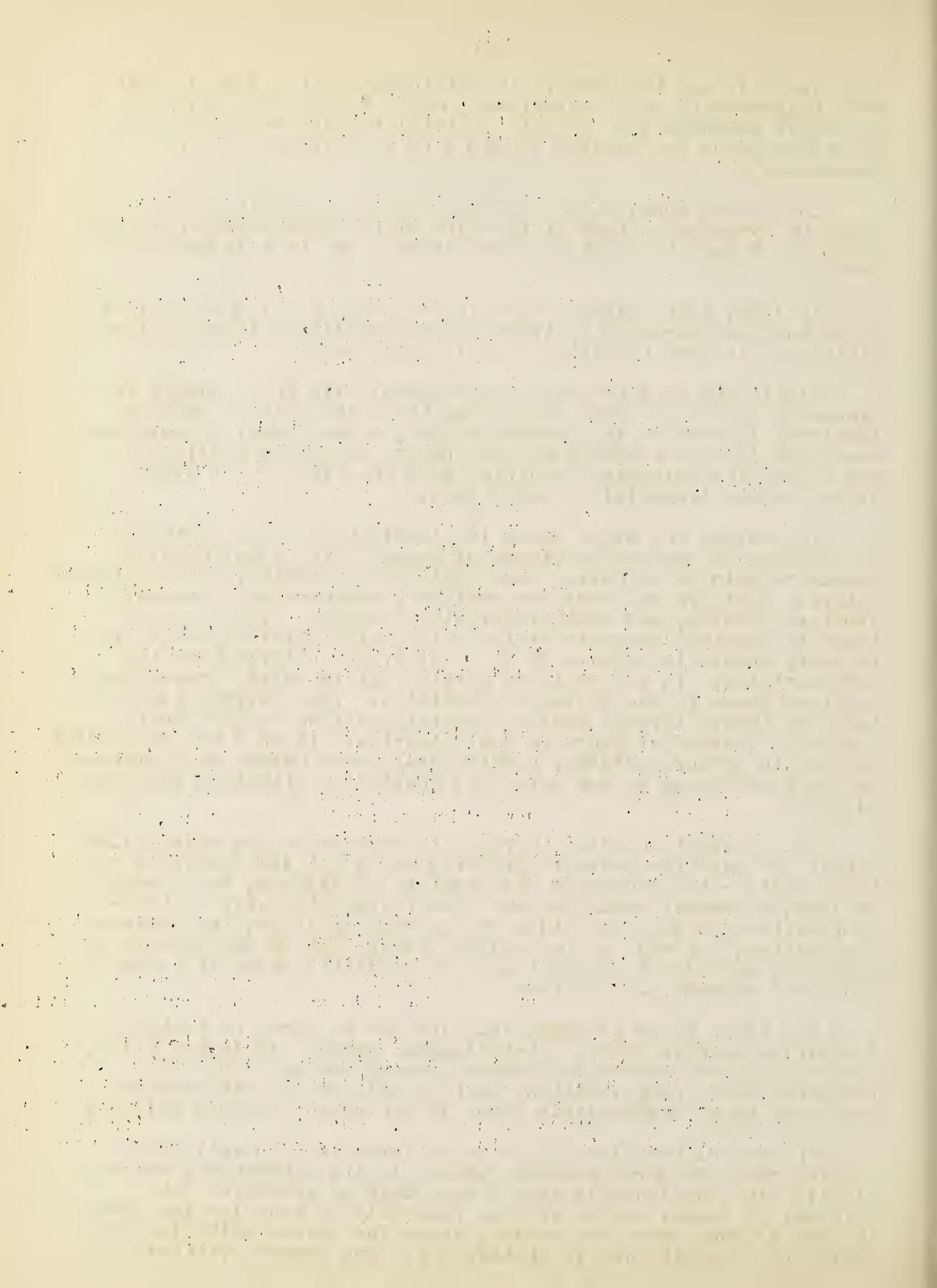
Within the past few years 1933-34-35, with the apparent increase of the Black Widow throughout the United States and particularly in some of the Western States, a great deal of work has been done in this connection; many papers have been published; and a definite poisoning resulting from the bite of the Black Widow, called Arachnidism, recognized.

In America the Black Widow is distributed as far north as the middle and western provinces of Canada. The Royal Ontario Museum reports it as having been collected in northern and southern Ontario, northern and southern Manitoba, northern and presumably southern Alberta, and southern British Columbia. It has been taken in practically every state in the United States, and there is every reason to believe it to be distributed throughout the United States. In the state of Maryland it is fairly common and has been taken in considerable quantities. Its distribution extends southward through Mexico, Central American and the West Indies to Tierra del Fuego in South America. It is found in greater numbers in warmer sections, particularly those having mild winters, as the Black Widow is not very well adapted to withstand rigorous winters.

The apparent reported increase in numbers of the Black Widow within the past few years is probably due to at least several of these facts - the generally mild winters of 1933-34, the drought of 1934, a gradual moving of the spider from its native out-of-door habitat to the protection of man made shelters, the greater recognition, not only of the spider itself, but of the effects of its bite, and also to a great deal of publicity given it by the press and current publications.

The Black Widow is found with its web in dark, protected localities such as lofts, out-buildings, around old lumber piles, protected fence corners and vacated rodent burrows. It also frequents dark, damp locations such as cellars and water meters and seems to be particularly found in and around outdoor privies.

The web of the Black Widow is an irregular, loosely woven, tangled mass of coarse strands running in all directions, not at all like the usual neatly shaped webs that we associate with spiders. A funnel shaped web may generally be seen leading from the web to some crack or crevice, where the spider waits in concealment. When the web is disturbed by some awkward visitor



temporarily ensnared, the spider approaches, always backwards, extending a freshly spun strand of viscid silk and commences to wrap her prey. When the victim is secure the bite is administered. This appears to have a virulent, paralyzing effect on the intruder. Frequently, little effort is made to secure the prey beyond a few retaining strands, many spiders apparently being more aggressive in biting. In the case of particularly large or active prey the spider may eject large droplets of viscous silk from her spinnerets; these dry quickly and serve to absolutely ensnarl such victims as make themselves difficult. The feeding is especially interesting as like all other spiders the Black Widow has no jaws, but only a mouth on either side of which is a single leg-like appendage known as the pedipalps, the upper segment of which, the coxa, bears a crushing plate called the endite, near the distal edge of which is a finely toothed keel, the serrula. When hungry, the spider takes her prey, crushes it with the endites, the serrula probably serving to lacerate so as to free the body juices. The crushed body is then held against the mouth and by the action of a sucking stomach, sucked dry. The remaining hard parts are then cut free from the web and discarded. The female once established in a web remains there throughout her life, feeding on unwary insects and guarding her egg cases.

The male Black Widow after moulting the last time leaves his web a mature spider in search of a mate. Unlike most other animals the male spiders possess no true copulatory organ. The ejaculatory organ consists of the receptaculum seminis, a complicated organ which works on the general principle of a bulbous syringe. This organ is situated in the digital or tarsus segment of the palpus. The endite and the segment bearing it, the coxa, (1) are regarded as the trunk of the pedipalps. The remaining segments, - trochanter, femur, patilla, tibia and tarsus, (2) are regarded as an appendage termed the palpus.) Sometime previous to mating the male spins a delicate web on which is emitted the seminal fluid from the opening of the reproductive glands (these are situated in the epigastric furrow, which is located on the ventral side of the abdomen near the basal end). This seminal fluid is picked up by the receptaculum seminis and stored while the male proceeds in search of a mate. During this time the male partakes of no food, although he may stop to suck up a little water or liquid food that may be immediately available. On entering the web of a likely mate the male vibrates his abdomen rapidly, causing a vibration of the entire web. The male then approaches the female and strokes her gently with his forelegs. This is all done very cautiously, - if the female is not agreeable death may result for the luckless suitor. If the female is agreeable she remains quiet while the male spins her up in a delicate web. Once the web is spun coitus is affected by the male's placing the receptaculum seminis in conjugation with the epigynum of the female. This has been observed to be repeated in some instances. When coitus has been affected the female easily frees herself and she may ensnare and feed upon her mate. This is the reason for the name - Black Widow. It has been observed however that in the presence of other immediate food she will not kill the male.

(To be continued in the October Bulletin.)

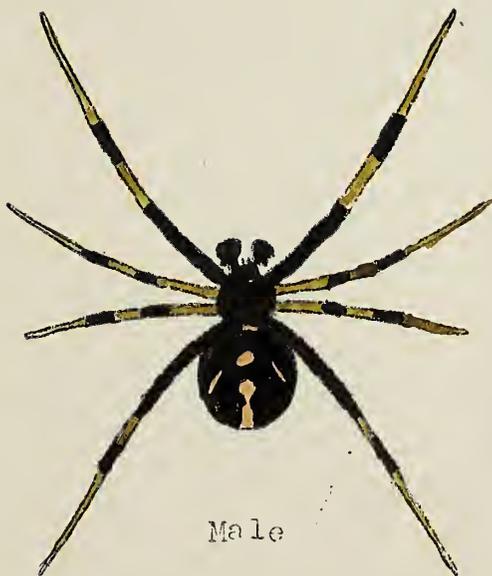
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THE BLACK WIDOW SPIDER



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Female



X4

Male

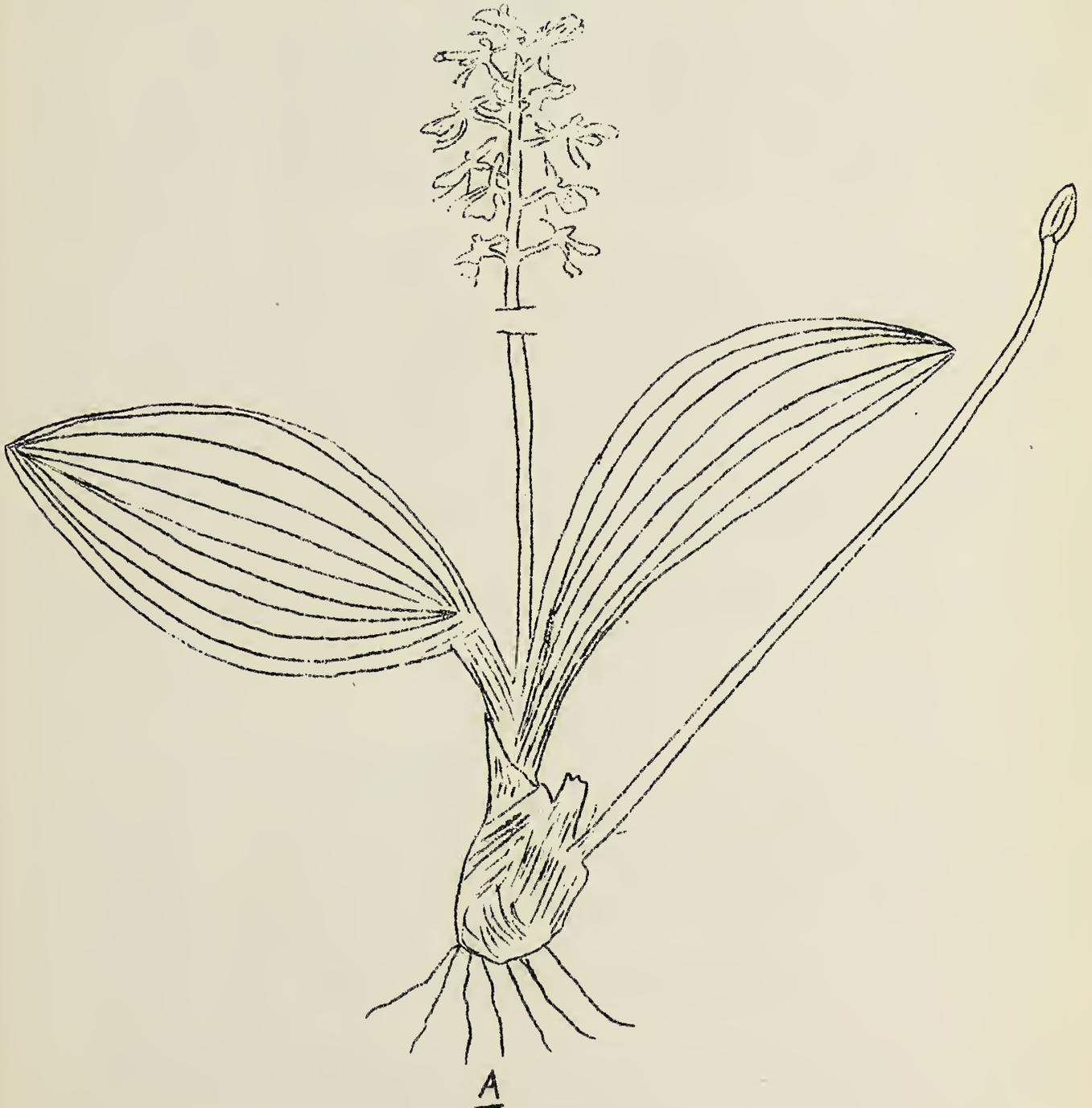
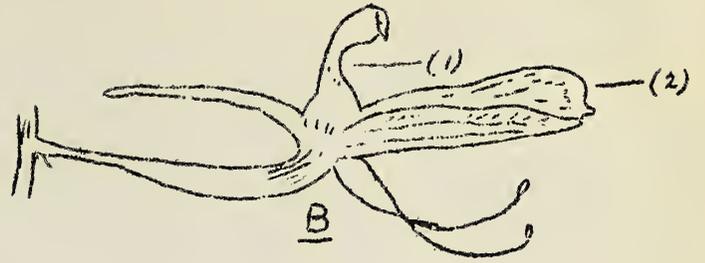


X4

Under side  
(Female)

(Figures after cuts from United States Department of  
Agriculture Publications).





*Liparis liliifolia*

A - Plant - natural size

B - Single blossom - X3



## LARGE TWAYBLADE (LIPARIS LILIIFOLIA)

By Earl H. Palmer

One of the outstanding characteristics of the genus *Liparis* is the pair of oval or ovate leaves rising from the root and clasping the stem. The name "Twayblade" is likewise used to denote the genus *Listera* - but this genus (*Listera*) bears smaller leaves half-way up the stem; a glance at the leaves will quickly distinguish the two genera. The leaves of the *Liparis liliifolia* vary from two to five inches long and one to two and one-half inches wide.

The scape (a leafless stem rising from below ground and bearing a flower or a flower-cluster) is four to ten inches high. The many flowered raceme is sometimes six inches long. The individual flowers stand off from the scapes - sketch B (after Gibson)-on pedicels fully three-quarters of an inch long; looking, as one writer put it, as though they "have a combative air like so many little dragons."

As to the exact method of fertilization, nothing to my knowledge has been published. An examination of sketch B will show that the incurved column (1) of B stands upright. (The column is a term applied to the consolidated pistil and anther of the Family Orchid.) The lateral petals and sepals are reduced to thread-like organs, while the one broad lip (2) of B is raised in a most enticing manner. Sketch B shows this broad lip to be slightly incurved, and, I think, with a reason. The lip bears a nectar-secreting groove down its median line. What is there to keep a visiting insect from knocking off the column's protective cap as he flies away, thus releasing the sticky pollen masses?

Range:- Maine to Minnesota south to Georgia and Missouri.

Habitat:- damp wooded ravines May to July.

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### NOTES

#### Meetings at the Society

September 3 - Talk by Mr. George Maugans, "Snakes of the Family Elapidae."

September 10 - Talk by Mr. Oscar Helm, "Idiosyncrasies of Teaching Biology."

September 17 - Talk by Mr. Walter E. Price, Jr., "The Limestone of Maryland."

September 24 - Lecture by Dr. E. A. Andrews of Johns Hopkins University, "Some Jamacian Snails." Illustrated.

#### Junior Meetings

September 7 - Meeting.

September 21 - Talk by Nathan Canter, "The Bacteria in Sheep."

#### Exhibits

September 1-7 - Exhibit at Timonium Fair, representing the work of our eight Natural History Departments.

September 8-16 - Exhibit at the Fish Culturist Show at Druid Hill Park. Some Maryland Fish.

FEDERAL BUREAU OF INVESTIGATION

WASHINGTON, D. C.

REPORT OF SPECIAL AGENT IN CHARGE

DATE OF REPORT

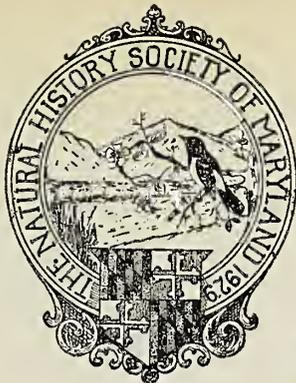
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**BULLETIN**

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Volume VI

OCTOBER, 1935

Number 2

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PRELIMINARY REPORT ON A POSSIBLE NEW SPECIES OF FOSSIL CRAB FROM  
THE MIOCENE OF MARYLAND

By Elra M. Palmer

This report is one of many to be published on the scientific results of the Miocene Paleontological Survey which has been conducted by the Department of Paleontology of this Society over a period of five years. A number of extremely interesting specimens have been found, many representing new species. The detailed descriptions of these species will be published later in the proceedings of the Society.

Occasional fragmentary remains of crabs have been found heretofore in the Choptank as well as in the St. Marys formation of the Miocene, but none was complete enough to afford identification. In the latter part of August, 1932, Mr. John B. Calder collected two specimens of the genus *Callinectes*, both excellently preserved and fairly complete. In August, 1934, Mr. Benjamin A. Calder collected an immature specimen of the genus *Callinectes* in the Pleistocene deposits of St. Marys County. A preliminary report on these specimens will be published shortly.

In November, 1933, the writer had the good fortune to find a specimen of the genus *Libinia*, one of the spider crabs. The specimen was found imbedded in the bluish clay of the St. Marys formation. The following fossils, characteristic of this formation were found in association with the *Libinia*: *Arca idonea*, *Polynices heros*, *Turritella plebeia*, *Nassa peralta*, and *Panopea goldfussi*.

The specimen found may be classified as follows:

Order Decapoda	Family Majidae
Suborder Reptantia	Subfamily Pisinae
Superfamily Oxyrhyncha	Genus <i>Libinia</i> (Leach)
<i>Libinia marylandicus</i> (proposed new species)	

The specimen designated as *Libinia marylandicus* is not complete. It consists of a much compressed carapace. The shape is triangular orbiculate. The dorsal surface is broken up into many



DECLARATION

I, \_\_\_\_\_ of \_\_\_\_\_ do hereby declare that the above is a true and correct copy of the \_\_\_\_\_

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plates; however, the intestinal, cardiac, urogastric and metagastric regions are clearly distinguishable. The urogastric region and the posterior end of the metagastric region is narrowly constricted. The rostrum is lacking and the pre- and postorbital spines are indistinguishable. Tubercles are easily noted near the margin of the mesobranchial region.

The ventral surface is partly obscure, being covered with hard matrix. The ambulatory legs as well as the chelipeds are lacking, but the coxae of all the legs can clearly be distinguished. The basis, ischium, and a portion of the merus of the left cheliped are the most complete leg remains of this specimen. The apron is lacking, and the anterior portion of the seventh segment of the sternum, as well as the region around the maxillipeds, is covered with matrix. Only a portion of the right sub-hepatic region is exposed.

The measurements of the type specimen in centimeters are:-

Length of carapace - - - - -	10.1 cm.
Width of carapace in widest part - - - - -	10.5 cm.
Exorbital width - - - - -	2.5 cm.

catalog M3000

The specimen is in the study collection of the Department of Paleontology of the Natural History Society of Maryland.

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### THE BLACK WIDOW SPIDER

(Continued from September Bulletin)

By Elmo Masters

The fertile female, when ready to deposit her eggs, forms a cup of loosely woven silk. The eggs are laid singly but very rapidly in this cup, which is then closed with a few strands and the whole is covered with a tough, waterproof covering of silk. This process, which usually takes place during the night, requires from one to three hours. These egg cases, white or buff in color, measure from  $1/2$  to  $5/8$  inch in diameter, are usually oval in shape and may contain from 25 to 910 (average around 400) spherical eggs. Each egg measures about  $1/32$  of an inch in diameter. A single female may spin from one to nine of the egg cases in a season, and Lawson (1933) reports, that in the month of July as many as four egg cases have been observed in one web, hanging balloon-like in the upper portion. The time elapsing between the deposition of these egg cases varies from one week to about four months, depending on the temperature and the amount of available food.

The time required for incubation of the eggs may vary from fourteen to thirty days. The spiderlings, after hatching, spend some time in the egg case before emerging (this is usual in all spiders) - this time may vary from four to thirty days. A spider



grows by a series of moults or sloughing of its skins as it becomes too small for them. The period between these moults is known as an instar. From egg to the first moult is the first instar. The first moult occurs in from one to two weeks after hatching (prior to this the spiderling cannot feed). Usually this instar and occasionally the second are spent within the egg case, and even after emerging the spiderlings cluster for several days thereabouts. Throughout this period (after the first moult) cannibalism reigns and their numbers are considerably lessened by this practice. It has been observed that the mother, even though extremely hungry, will not feed upon her own young.

When first hatched and prior to the first moulting the spiderling is very pale in color, the abdomen - white with no markings, and the cephalothorax (3) white to pale yellow. In the second instar the spiderling becomes darker, particularly the eyes, appendages and mouth parts; two rows of black dots appear on the dorsal side of the abdomen and the hour glass design begins to appear on the ventral side. From the third instar to maturity there is present a wide variety in color patterns, and in this instar lateral stripes appear on the dorsal side of the abdomen, the abdomen becomes a pale, yellowish green in color, and the legs acquire four black bands; also the hour glass marking on the ventral surface takes on a crimson tinge. In the fourth instar all of the markings become darker. About this time the spider becomes negatively phototropic (goes away from light). Barrett (1927) states that this develops after the fourth moult, and also at about this time the spider establishes itself in some dark, protected crevice where it constructs a small web. This web is retained and enlarged progressively as the spider matures. In the fifth instar all of the white areas become a light brown in color, and the central stripe on the dorsum is constricted and acquires a reddish tinge near the tip. The hour glass marking becomes quite distinct. In this instar males usually mature. In the sixth and seventh instars all coloration becomes much darker and reddish dots may appear at or near the center of the dorsum; usually only females pass through these later instars. Only females have an eighth instar and the spider becomes all black except for the crimson hour glass marking and occasionally a white band or an additional crimson spot near the anterior of the abdomen. These instars are by no means consistent in number as they seem to depend largely on food and weather conditions, and in the male may range from three to six moults while in the female there may be six to eight.

The mature female Black Widow is usually of a uniform black or sepia with a characteristic sheen described by Phillips (1935) as a "patent leather" appearance. The most characteristic marking is the crimson hour glass on the ventral surface of the abdomen. Occasionally this marking consists more of two triangles than an hour glass and it may vary in color from a dark marking hardly discernible to a pale yellowish color. In the male the "patent leather" appearance is altogether absent, for it is much paler in color with markings on the dorsum similar to an immature female. The abdomen of both the male and the female is of a characteristic globose shape often likened to a "shoe button", and in the average female it is about  $1/4$  of an inch wide. A mature specimen measures about  $1\frac{1}{2}$  inches with the legs extended. Males are usually smaller than females.



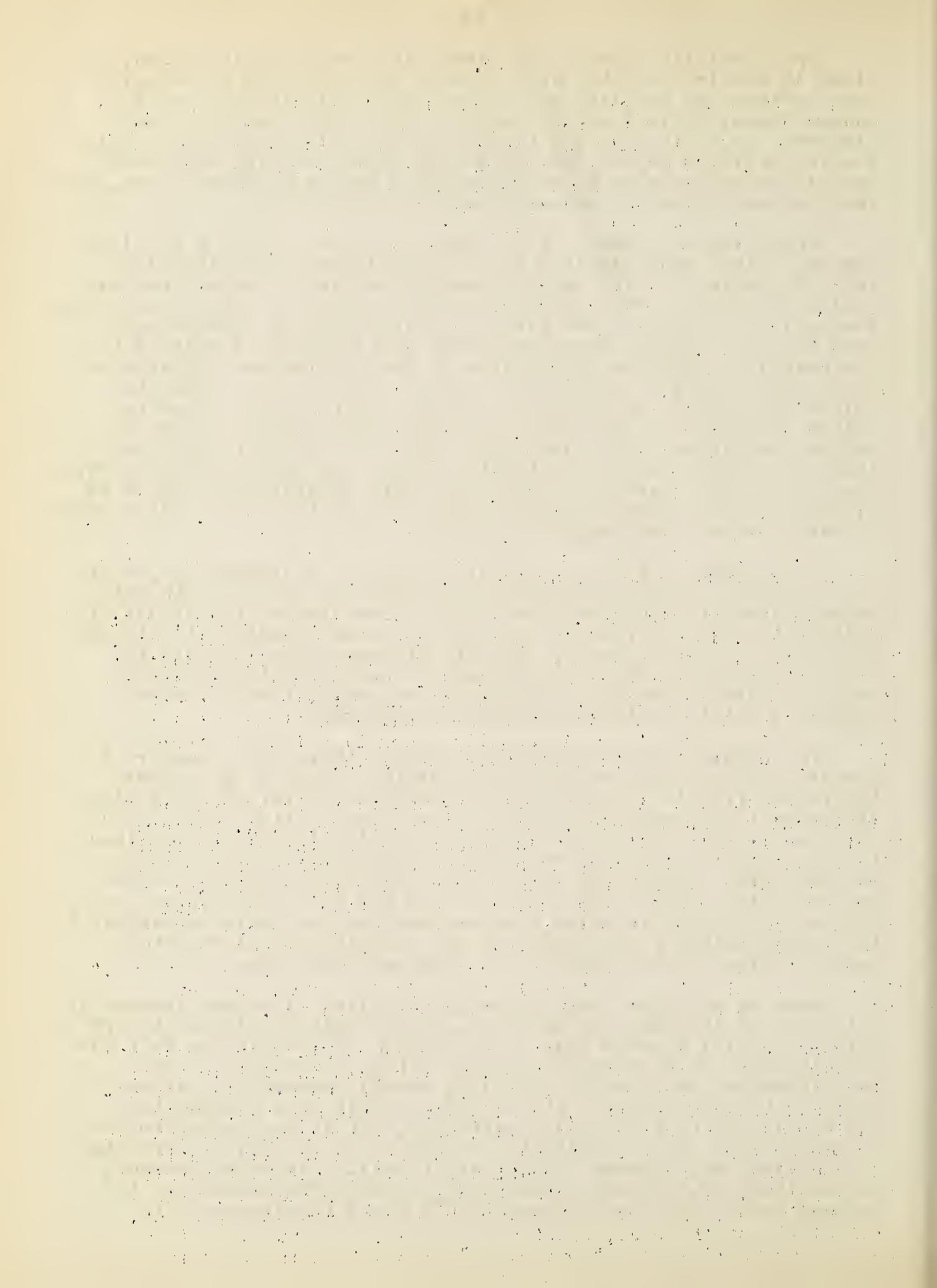
The usual life cycle of a Black Widow is a single season, but since it requires about four months to pass from egg to maturity, young hatched in the late summer or early fall hibernate as immature forms, while females hatched in the early summer often hibernate as adults and lay their eggs the following year. Jellison and Phillips report that they have taken immature specimens deep in rodent burrows in November after the ground has frozen, and they suggest these as natural places of hibernation.

The poison apparatus of the Black Widow consists of two long, narrow, poison sacs situated in the cephalothorax and extending about two-thirds of its length, curving outwardly towards the exterior body wall. From recent reports it would seem these sacs are absorptive in function and pick up their poisonous constituents from the body fluid. These sacs have ducts leading forward into the heavily, chitinized chelicerae or fangs which are situated on the forward portion of the head. At the time of the biting the poison is expelled through these fangs. In the male spider the poison apparatus is only used in the immature stages, and in the mature form is small and inactive. This may be due to the fact that the mature male does not attack prey. In the female, however, the poison sacs increase in size, and with maturity the poison is virulent, there being sufficient poison present in the adult female to make her presence dangerous to man.

Black Widow poisoning, Spider poisoning or Arachnidism, as it may be called, is now definitely recognized by medical authority. Experiments with the poison venom have demonstrated its ability to destroy the blood corpuscles of animals, thus classing it with the strongest of blood poisons. Despite its neurotoxic effects the venom of the Black Widow is not under usual conditions fatal to man, (in fatal cases there is usually a complication of other diseases) but its bite is definitely dangerous.

The Black Widow is ordinarily shy and there is no danger of her attacking a human being, but as stated by Dr. W. A. Hayward "accidents from the bite of this spider are due largely to faulty discernment in tactile responses. When some portion of the body comes in contact with her web thereby shaking it, she is inclined to respond in a seemingly senseless manner attacking and biting the intruding object. Due to the fact that under the seat of the outdoor toilet is so common a place for her to be found, many of the reported cases in males have occurred on the penis or scrotum." It is interesting to note that in the majority of all reported cases of Black Widow bites the victims have been men.

Persons who have been bitten by the Black Widow are frequently not aware of the bite, at the time, as the pain is similar to the prick of a pin; however pain in the region of the bite is felt almost immediately thereafter, usually within ten minutes. This pain increases and spreads steadily, usually reaching a maximum in from one to three hours. It has been described as excruciating and agonizing and is usually continuous, but it may be intermittent or cramp-like. It is manifested by screaming or moaning, writhing and doubling up. Spasms of the larger muscles are also present, particularly of the back, chest and abdomen. The muscles of the abdomen become rigid and "board-like"; local tenderness as in

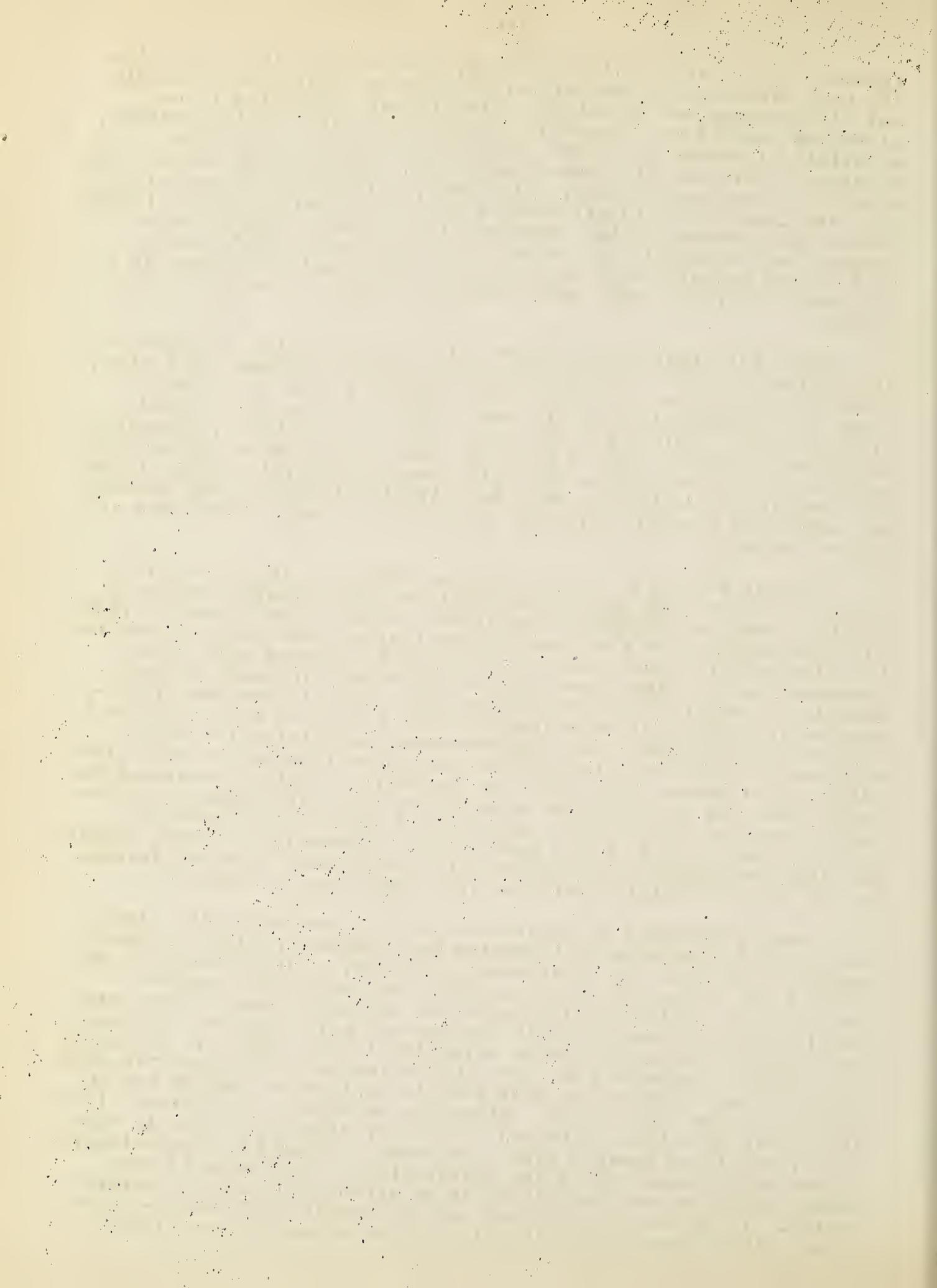


appendicitis is almost always absent, however, but this condition has been mistaken for general peritonitis or other severe abdominal disturbances and occasional patients have submitted to exploratory operations. There is a slight rise in body temperature, a definite increase of white corpuscles in the blood, profuse perspiration is usually present and often a tendency to nausea and vomiting, localized edema, restlessness, difficulty in breathing, and occasionally constipation and retention of urine. Bogen (1932) reports an increase in the pressure of the spinal fluid. These symptoms are generally continuous (gradually subsiding) for 12 to 48 hours and all symptoms usually spontaneously disappear in a few days. In fatal cases death usually occurs in from 14 to 34 hours.

First aid treatment for Black Widow spider bites consists of the application of a local antiseptic, such as tincture of iodine, to prevent secondary infection, the application of epsom salt packs to relieve pain, and the usual treatment for shock should it be present. Although recommended by a few - cutting, bleeding, cauterization and application of the tourniquet, as in Rattlesnake poisoning, is frowned upon since the venom is neurotoxic in effect and practically instantaneous. Such treatment is not only useless but extremely painful. The use of alcohol or other stimulants is not recommended.

Medical attention for all persons bitten by the Black Widow should be secured at once. This treatment will consist mainly of opiates, such as morphine administered in very large doses (strychnine and caffeine are also used), hydrotherapy, and similar measures to alleviate the acute pain. Bogen reports success with spinal punctures and he lists more than seventy-five different medical remedies of which three are outstanding - spinal puncture, intravenous injections of magnesium sulphate (10 cc of a 2% solution to relieve hypertension), and intramuscular administration of convalescent serum (serum taken from convalescent patients) when given within eight hours. The field of discovery of better treatment is still open, but inconsistent symptoms and the difficulty of reproducing constant symptoms in experimental animals will probably make progress in this field rather slow. Recently, however, Becker and D'Amour (1934) have announced the development of an antiserum. As yet there is little available information on its success.

Great difficulty is experienced in the control of the Black Widow, due to its wide distribution and solitary habits. A great measure of success can be attained, however, by the collection and destruction of the egg cases, as they are conspicuous and not carried by the spider. Fly sprays and ordinary insect sprays have but little effect on the adult spiders but a 1% solution of nicotine sulphate in water is very effective if the spider is thoroughly drenched. Creosote has proved to be the most effective material yet used. When sprayed it will kill the spider on contact and it further acts as a repellent. Since the majority of all Black Widow bites occur in outdoor latrines, the under sides of seats, in such places, should be treated with a creosote application. Experiments are now being conducted by the University of California to find natural predators and parasites, in an attempt to create a natural control. It is recommended that persons working with water-meters or such other places where the Black Widow abounds, wear gloves.



Spiders, with the exception of the Black Widow, are very beneficial to man, and by their destruction of innumerable insects render a great service. It would be most deplorable if we in our zeal to eradicate the Black Widow should kill or allow to be killed other harmless spiders.

(1) The coxa is sometimes termed the maxilla. (2) Sometimes called axillary, humeral, cubital, radial and digital.

Notes 1 and 2 refer to a specialized set of terms often used to describe the segments of the pedipalps.

(3) In all spiders the head and thorax are fused into one part termed the cephalthorax. (Bibliography on page 13.)

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### NOTES

#### Meetings at the Society

October 1 - Talk by Mr. Richard E. Stearns, "Excavation of Indian Village Sites in Florida."

October 8 - Talk by Mr. John B. Egerton, "Self Pruning."

October 15 - Talk by Mr. William Lehr, "Mechanics of Mountain Formation."

October 22 - Talk by Mr. Gilbert C. Klingel, "Symmetry in Nature."

October 29 - Talk by Mr. Bryant Mather, Jr., "Native Elements in Maryland, with a Special Reference to Gold."

October 30 - Lecture-Associate Members and Friends-by Mr. Gilbert C. Klingel, "A Naturalist's Adventures in the Bahamas."

#### Junior Meetings

October 5 - Talk by Mr. Elra M. Palmer, "The Hobby Show."

October 19 - Lecture by Mr. Gilbert C. Klingel, "A Naturalist's Adventures in Inagua."

#### Lectures to Outside Organizations

October 22 - Lecture at University of Maryland by Mr. Govane McClees, "The Diving Helmet and Its Use."

October 18 - Lecture to Boy Scouts of America, Harford Road District, by Mr. Gilbert C. Klingel, "Exploring the Bottom of the Chesapeake."

October 25 - Address - Maryland State Teachers Convention, by Mr. Elra M. Palmer, "Educational and Scientific Material Available at the Natural History Society of Maryland."

#### Exhibits

September 20 - Branch 12, Enoch Pratt Library "Sea Shells."

October 12 to November 1 - Junior High School #1 Exhibit of Birds, Reptiles, Insects, Fossils, Minerals and Plant Materials.

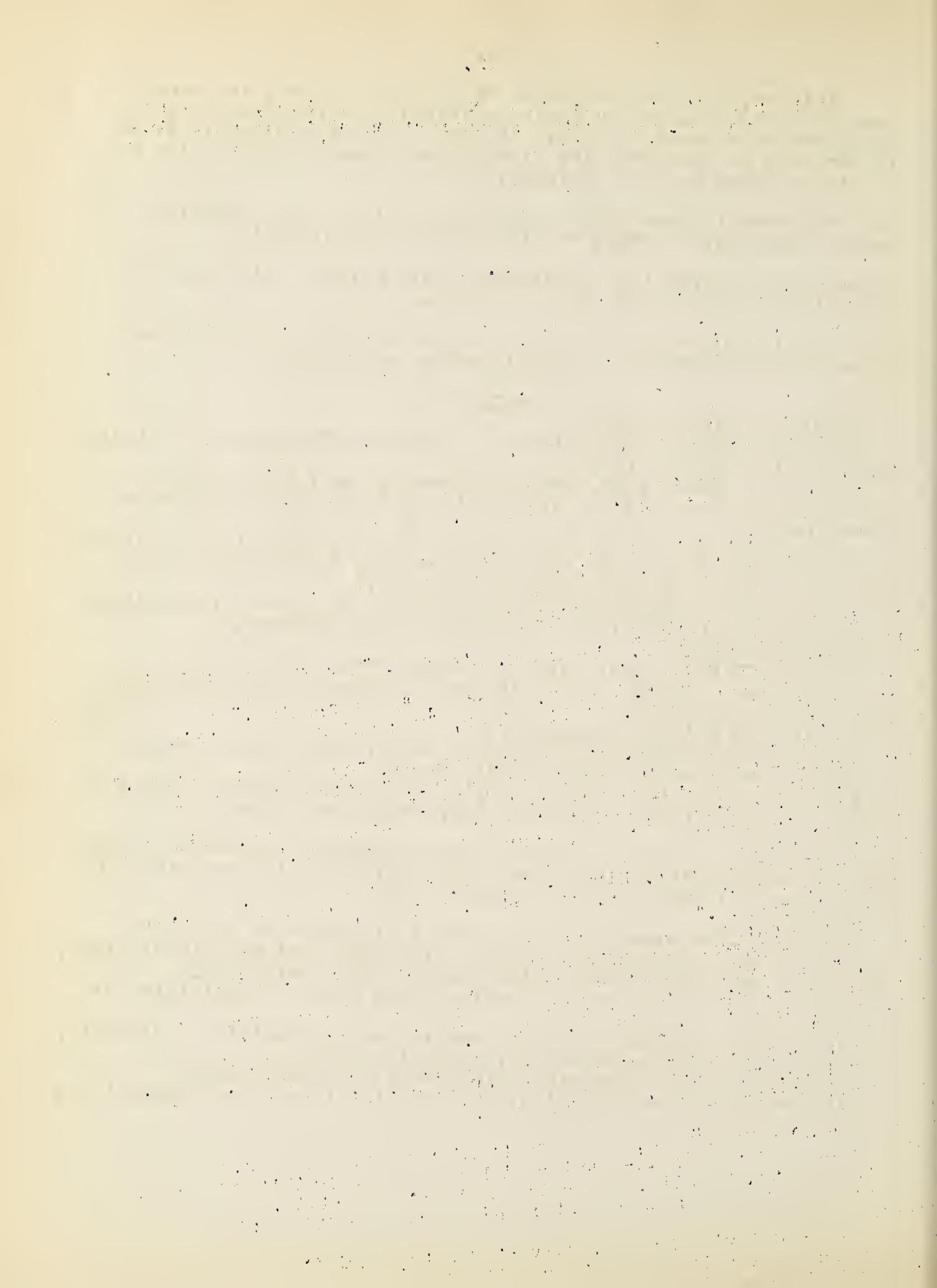
October 30 to November 15 - Eastern High School - Exhibition of Fossils.

October 31 - Fairview School, Calvert County, Exhibit of Minerals.

Special School Service - Baltimore City College

October 16 to 19 - Exhibit of Insects for Demonstration.

October 23 to 26 - Demonstration - Plant Materials and Exhibition.



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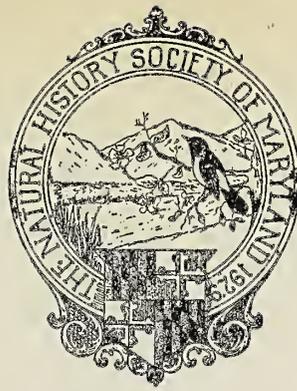
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**BULLETIN**



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Volume VI

NOVEMBER, 1935

Number 3

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SOME BALTIMORE SUMMER-FLOWERING ORCHIDS

By John B. Egerton

As every good business man regularly takes account of his stock-in-trade so should the naturalist keep informed of the objects of his affections. In the course of "civilization", woodland and stream are cleared and nature's richest legacies squandered. If this process continues in the future, guided by no more intelligence than it has been in the past, there will be nothing left in a few years but the memory of a once rich heritage and only so much of that as has been recorded and passed on to posterity by the naturalists who have seen, loved and cherished it.

Baltimore and Maryland are indeed fortunate I think, in having a body of naturalists dedicated to this worthy and laudable task. The field is large and there is promise of varied and abundant crops, but the workers are few in comparison, and their tools inadequate. But where there is a will, a way will be found.

For several years past, I have been anxious to "take stock" of our summer-flowering orchids, but the opportunity did not present itself. During the summer just passed, however, I was fortunate enough to have associated with me in this task a number of young botanists, members of the Natural History Society of Maryland and some others, all eager for new conquests, who spurred me on to get out into the country even on some very hot and sultry days when the coolness of my study might have been preferable to the sultry vapors of overgrown thicket and tangled brier.

But searching for orchids is so fascinating that once one gets on the trail of these alluring plants most physical difficulties are forgotten. The rarity, shyness and beauty of some species make them universal favorites with all lovers of the beautiful. Yet these very qualities that charm us so are, like human popularity, likely to be their own undoing. Hence the need and value of original observation, and permanent record, lest all be forgotten.

Unfortunately Baltimore and vicinity are no longer blessed



with a large number of showy species of the Orchis Family. When one mentions the Pink Moccasin Flower (*Cypripedium acaule*), the Showy Orchis (*Orchis spectabilis*), and the Yellow Ladys Slipper (*Cypripedium parviflorum*) he has about exhausted the list of showy species. And moreover these are all spring flowering forms, so that when one runs across a large and brilliantly colored orchid later in the season, he is very much pleased.

It fell to our good fortune during the past summer to find, on two or three occasions, these beautiful species. First, on June 27, Father Frisch, S.J., head of the Biology Department at Loyola College, some students, and the writer were botanizing in a meadow, when Father Frisch spied a beautiful specimen of the Green Fringed Orchid, (*Habenaria lacera*). Then each of us took a turn and located other specimens nearby. The same species was found subsequently by Clyde Reid in several other localities some distance from the first place.

On June 22, while outing in the vicinity of Prettyboy Dam, about twenty miles north of Baltimore City, we ran across an orchid in bud. It seemed to be one of the *Habenarias*, but I was not sure and, as there were several plants growing there, I dug up one and took it home. Just one month later it bloomed and was identified as the smaller Green Orchid (*Habenaria clavellata*). The same species was also found in another locality, miles away, just finishing blooming on August 13. This orchid is not a showy species.

On July 13, we recognized for the first time plants of the large, Round-leaf Orchis, (*Habenaria orbiculata*). It was growing along with *Orchis spectabilis* on a shady, moist hillside. When first seen, I was struck by the way the leaves lay appressed to the ground and said to myself, "This is surely not the common Showy Orchis." One of the plants had already flowered but the long spur of some of the withered flowers still clung to the ovary and made the identification certain.

But one of the best finds of the summer occurred when the young botanist, Clyde Reid, called and asked, "What is this pink flower here in the thicket?" We were then exploring a marshy meadow in which the pink milkweed, (*Asclepias incarnata*), in full flower, predominated with Water Plantain and Arrowhead close seconds, and Cardinal Flowers and Cat-tails nearby. At first glance I thought it was a pink Phlox, for at a distance it might well be taken for the far more common plant; but I soon realized that I was wrong. It was no common flower at all; it was an orchid, but which one I could not say for sure at the time.

Well, we scoured the meadow all around and within a radius of fifty yards found about two dozen plants, some larger but most smaller, than the first plant seen. One specimen was taken for the herbarium. On being analyzed this proved to be *Habenaria peramoena*, claimed by some to be our handsomest wild orchid.

A few days later, Mr. W. Bryant Tyrrell brought in a fine specimen of the Crested Yellow Orchis, (*Habenaria cristata*), which I have not seen for many years. It once grew in great profusion in a swampy piece of ground in southwest Baltimore, but it has long since departed. The specimen brought in had been found near Jessups, about twenty miles southwest of Baltimore.

*[The text on this page is extremely faint and illegible. It appears to be a multi-paragraph document, possibly a letter or a report, but the specific words and sentences cannot be discerned.]*

Another worthwhile find was a number of fine specimens of the Canefly Orchid, (*Tipularia unifolia*) by another botanical friend, Mr. Earl H. Palmer, in the extreme southern part of the state near the Potomac River. The tallest plants were about fifteen inches high and consisted of a single cylindrical, leafless spike of almost invisible flowers. *Tipularia* is a rather widely distributed plant in the Coastal Plain region of Maryland, but there are usually only a few plants in one place; it grows in small groups. The leaves, dark green above and reddish-purple beneath, are striking enough in the fall and winter but not so at time of flowering in late summer when the old leaves have disappeared and the new ones have not yet appeared. *Tipularia* is leafless at time of flowering.

A very attractive little orchid, as far as foliage is concerned, is the Rattlesnake Plantain, (*G. pubescens*). It is our most widely distributed and possibly the most abundant member of its family in the vicinity of Baltimore. Its grayish-green leaves variegated with white veins make it quite conspicuous by contrast with the bright green mosses and brown leaves of the forest floor. Its flowers, though quite small, are numerous and form a dense spike on a long leafless stem in July and August.

And lastly come the little Ladies' Tresses, but this takes us rather into the fall.

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## THE MINERALS OF THE MONTEBELLO AREA, BALTIMORE

By Francis Wise

The Montebello area, which lies at Hillen Road and Windemere Avenue, is a barren stretch of sun baked soil covered with patches of rough dry grass. Approaching this region on the east from Hillen Road, one comes to a pond which is sometimes dry. The small streams of the region end here and deposit their detrital material. Small pieces of mica, tourmaline, and ironstone are to be found.

Muscovite is the most commonly found mica. It is found in the mud of the streams in silvery plates from one to three inches in size. It is here that one also finds black tourmaline crystals coated with clay and flakes of mica. Most prominent is the ironstone, which in the form of sand gives a ruddy appearance to the surrounding area.

Walking up towards the woods one comes to a field in which ironstone concretions are very common. These, upon being broken open, show their interior to be filled with coarse sand; the size of the concretions varies up to about three inches.

Farther up the hill tourmalines in quartzite or white clay are to be found. These are small black crystals usually of poor quality due to weathering, although some still show the hexagonal prism faces, but are rarely terminated.

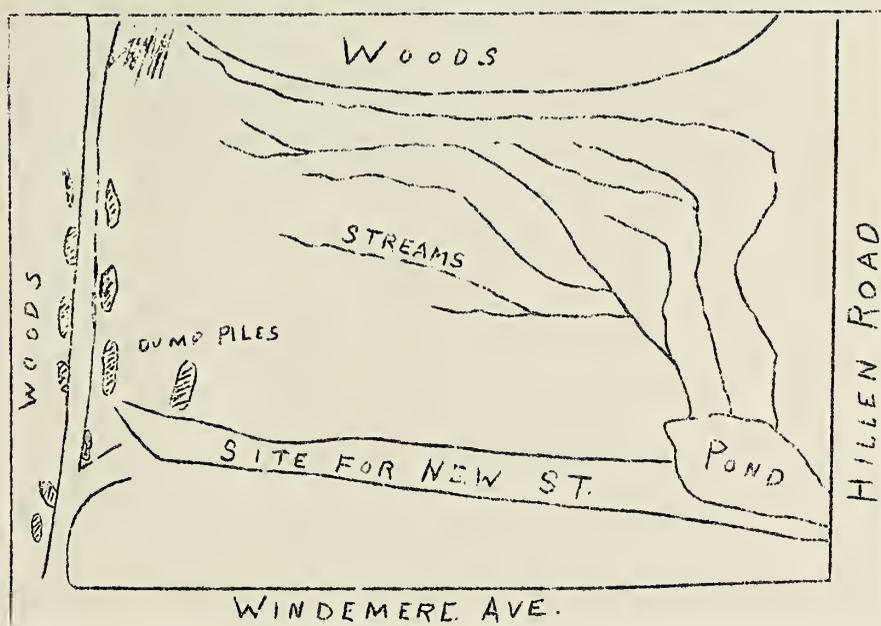
Walking west to old Hillen Road, one finds piles of stone which were left there after the completion of the building of the Montebello tunnel a few years ago. Presumably this rock came from the underlying rock bed which is principally Baltimore Gneiss.



The minerals found on the rock piles are epidote, pyrite, feldspar, mica, and garnet. No unusual specimens have been found. The pyrite occurs in epidote in broken tarnished cubes.

To the east are found quartz pebbles covered with a film of iridescent limonite. These are of fair quality, but the best specimens come from a similar region about two miles to the northwest.

All these minerals are most commonly found distributed at random throughout the territory. This is due to the weathering of the great amount of excavated rocks present, which yield their minerals to the surrounding soil.



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#### NOTES

##### Meetings at the Society

November 5 - Talk by Mr. Irving E. Hampe, "The State Forest Preserve."

November 12 - Lecture by Dr. F. D. Crane, "Clays, Past and Present."

November 19 - Talk by Mr. Lewis Puten, "The Life History of the Spotted Salamander."

November 26 - Talk by Mr. Milton T. Oler, Jr., "The Elephant and His Progenitors."

November 22 - Lecture to Associate Members and Friends by Mr. Elra M. Palmer, "The Miocene Fossils of Maryland."

November 23 - Staff Meeting.

##### Junior Meeting

November 2 - Lecture by Mr. Milton T. Oler, Sr., "Casting of Natural History Specimens."

November 16 - Lecture by Mr. George Maugans, "Reptiles."

##### Lectures to Outside Organizations

November 5 - To the Eastern High School by Mr. John B. Calder,



"Fossils - What They Are and Where They Are Found in Maryland."

November 7 - To the "Cosmopolitans" of the United Presbyterian Church by Mr. John Calder, "Fossils - What They Are and Where They Are Found in Maryland."

November 8 - Troop 146 - Boy Scouts of America by Mr. H. C. Robertson, "The Ways of a Snake."

November 13 - To the Clifton Park Junior High School by Richard Webster, "Insects of Maryland."

November 20 - To the St. Agnes Hospital Staff by Dr. Howard A. Kelly, Assisted by Mr. H. C. Robertson, "Reptiles and the Treatment of Snake Bites."

November 22 - To Troops 100 - 112 Boy Scouts of America by Mr. Joseph White, "Native Fish in the Aquarium."

November 27 - To the Clifton Park Junior High School Science Club by Elias Cohen, "Collecting Snakes and Turtles."

#### BOOK REVIEW

"Parade of the Animal Kingdom" by Dr. Robert Hegner, Macmillan Co., New York, 675 pages, 743 illustrations. \$5.00 Indexed.

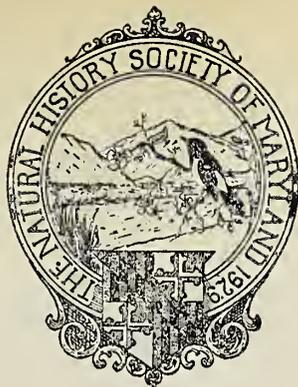
This book should be of general interest to all nature lovers, especially those who care to read a good popular scientific outline of the animal world. It should also be an aid to beginners in biology, as it gives many fine examples of life histories in the various classes, from the protozoa to the mammals. Teachers and nature trail builders will find this book quite useful.

We are especially interested in this book since our Society has contributed some dozen or more of the illustrations used.

Dr. Hegner presented a copy of "Parade of the Animal Kingdom" to the Library of the Society.

Edmund B. Fladung





BULLETIN



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Volume VI

DECEMBER, 1935

Number 4

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SOME NOTES ON THE MINERALS OF THE BLUE MOUNT QUARRY

By Walter E. Price, Jr.

The Blue Mount Quarry, operated by the J. E. Baker Company of York, Pennsylvania, is the largest quarry in Baltimore County, and is situated on the Gunpowder Falls, along Big Falls Road, one mile southwest of White Hall. The immense workings in a slightly serpentinized basic igneous rock (trap) comprise an exposure 450 feet long worked back for some few hundred feet from the stream. The rock as a whole is purplish-black and hard, but in a few places veins of serpentine may be found, much softer and light green in color.

The close relation between these rocks of both igneous and metamorphic origin, affords a large variety of minerals common to both types, and consequently this locality proves to be a veritable treasure trove for the mineralogist. The quarry is being extensively worked and thus fresh material is constantly being exposed, a factor very essential for the best study and collecting.

The minerals to be found are the following:-

Serpentine (1),  $H_4Mg_3Si_2O_9$  Found in many varieties, chief among which are antigorite, chrysotile, picrolite, and williamsite. Serpentine is the most abundant mineral found at the quarry.

Talc,  $H_2Mg_3(SiO_3)_4$  In soft, light green masses.

Bronzite, ( $MgSiO_3$  with little iron) Occurs in bronze-like sub-metallic cleavages in the trap.

Actinolite,  $Ca_2(Mg,Fe)_5(OH)_2(Si_4O_{11})_2$  In glassy, green prismatic crystals, usually with talc.

Pyrite,  $FeS_2$  In small brassy, yellow masses and veins.

Chromite,  $FeCr_2O_4$  In black grains in serpentine; not abundant.



REPORT

of the

Commissioners of the

General Land Office

for the year

1875

Washington

1876

The following is a list of the lands sold by the General Land Office during the year 1875, with the names of the purchasers, the amount of the purchase money, and the date of the sale.

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Quartz,  $\text{SiO}_2$  Found as masses of chalcedony, and in sparkling druses.

Calcite,  $\text{CaCO}_3$  In veins and small crystals; sometimes in cleavages of Iceland spar.

Dolomite,  $\text{CaCO}_3 \cdot \text{MgCO}_3$  Found in masses and small crystals. The white massive dolomite resembles porcelain somewhat, and is luminescent after exposure to ultra-violet light. The crystals are light brown, about  $3/16$  inches in size, and occur in cavities.

Aragonite,  $\text{CaCO}_3$  Occurs in beautiful small white tufts of radiating, acicular crystals with drusy quartz and other minerals in joint cavities.

Magnesite,  $\text{MgCO}_3$  Occurs in white, chalky masses and seams.

Hydromagnesite,  $\text{Mg}_4(\text{OH})_2(\text{CO}_3)_3 \cdot 3\text{H}_2\text{O}$  Found as thin, white crusts on rock surfaces.

Brucite,  $\text{Mg}(\text{OH})_2$  Translucent, white, pearly cleavages. Some specimens fluoresce blue (argon bulb) and luminesce strongly.

Pyroaurite,  $\text{MgCO}_3 \cdot 5\text{Mg}(\text{OH})_2 \cdot 2\text{Fe}(\text{OH})_3 \cdot 4\text{H}_2\text{O}$  Recently Francis Wise, a junior member of this Society, received a letter from the United States Geological Survey, Washington, D.C., in which it was stated that a mineral specimen from this locality submitted by him for identification, was pyroaurite. The mineral is a pearly brown lamellar mass, intimately mixed with manganese calcite on a nickeliferous serpentine. Purer specimens are being sought for further investigation. The chief localities for pyroaurite in the world are in Sweden and Scotland. The verification of this mineral occurrence will establish the fact that Blue Mount, Maryland, is the only reported locality for pyroaurite in the western hemisphere.

Deweylite,  $4\text{MgO} \cdot 3\text{SiO}_2 \cdot 6\text{H}_2\text{O}$  In white to brown colloform masses filling cavities.

Aquacryptite (2), (amorphous magnesium silicate). A mineral that is probably aquacryptite is found in the serpentine in dull masses, grading from white to yellow, to brown. Cracks up very easily.

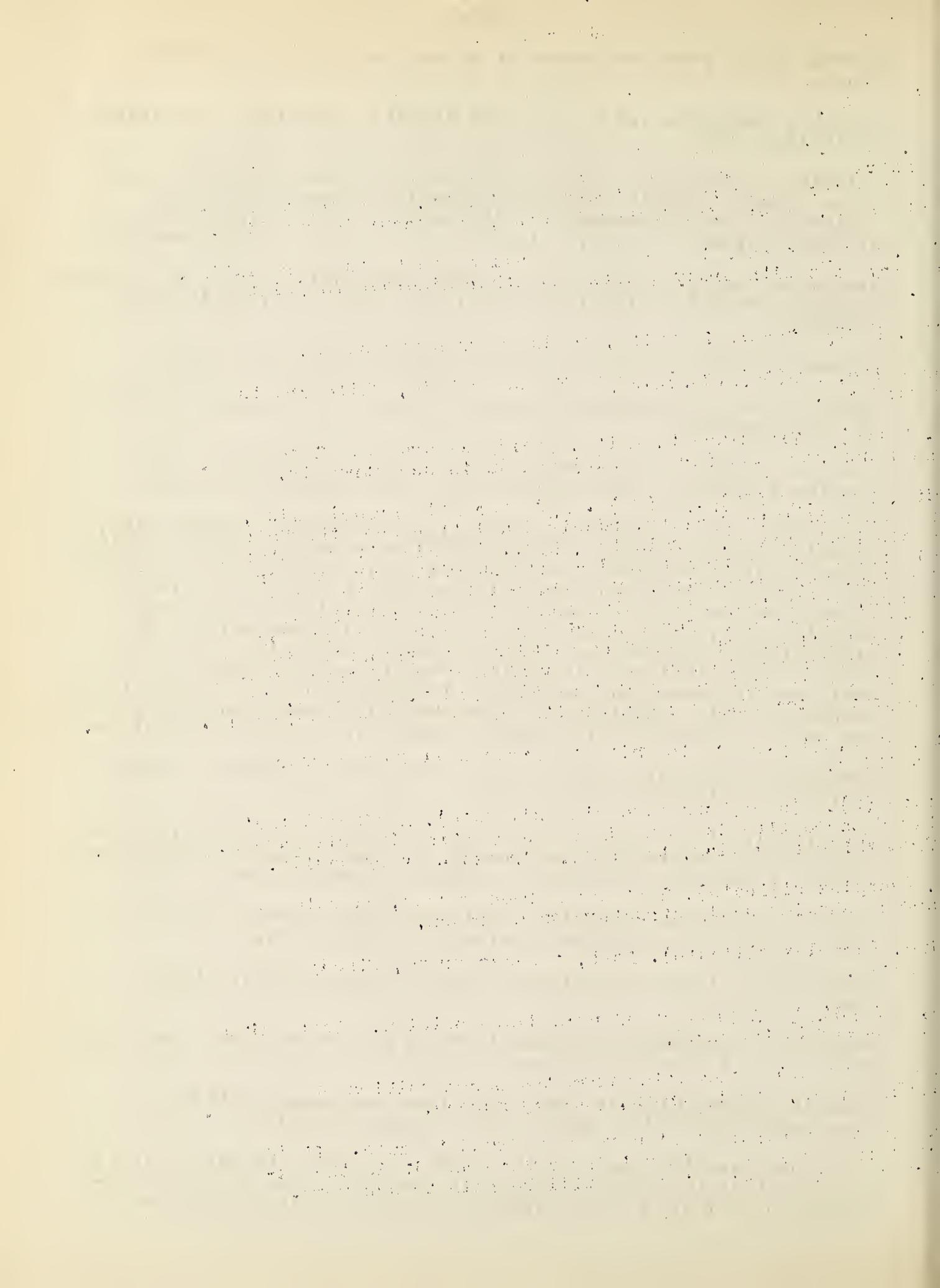
Chlorite, (complex silicate). Soft dark green masses, exposing a choppy surface showing scaly structure when broken.

Vermiculite, (complex silicate). Soft, tobacco brown, finely foliated masses.

Kaolinite,  $\text{H}_4\text{Al}_2\text{Si}_2\text{O}_9$  A product of rock decomposition. Soft white masses that powder in the hand.

Limonite,  $\text{H}_2\text{Fe}_2\text{O}_4(\text{H}_2\text{O})_x$  Resulting from the decomposition of ferriferous minerals. Rusty brown, powdery masses.

These are the minerals that have been found to date. It is believed that the above list is yet incomplete and it is the expectation that in the near future we will be able to add more.



Note (1) Serpentine is a rock, not a mineral. Modern authorities have declared serpentine to consist of two minerals of the same composition,  $H_4Mg_3Si_2O_{10}$ , antigorite (fibrous, lamellar, or massive) and Chrysotile (always in fibrous seams). The modern tendency is to disregard the multiplicity of varieties of the old Dana system, but yet to retain a few old terms to designate the more distinct varieties. The term "serpentine" is used above in this light for convenience.

Note (2) This mineral has a hardness of 2.5, G-2.0, decrepitate before the blowpipe, and falls to pieces in water with a crackling noise. It has an orange-yellow streak and adheres to tongue. This conforms apparently with the description of aquacryptite. This mineral belongs to a group of very similar amorphous minerals whose nature is still little known, making fine discrimination very difficult.

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## BIRD NOTES FROM OCEAN CITY, MARYLAND

By W. Bryant Tyrrell

On the 15th and 16th of June, 1935, Mr. F. C. Kirkwood, my son, Arthur, and I spent part of two days in the region of Ocean City.

Ocean City is located near the northern boundary of Maryland on a long sand bar that flanks the ocean along almost the entire length of Delaware, Maryland, and the Virginia peninsula. This bar which varies from a quarter of a mile to several miles in width has a wide sandy beach fronting the ocean, back of which are low grass-covered dunes, and beyond these, flats and tidal marshes cut into by many estuaries from the various bays. Two areas of this region were visited, both similar - one to the north of the city on June 15, and the other, the more interesting of the two because of its abundant bird life, to the south of the city on June 16.

So far as I was able to ascertain very little definite information is available about the bird life of the region, and therefore it was with considerable enthusiasm that we welcomed an opportunity to visit the region, even for only a short period.

We arrived at Ocean City about noon on June 15, and after a hurried lunch started up the beach. There was a slight breeze off the ocean but nevertheless the heat was intense, both from the direct rays of the sun and the reflected heat from the hot sand. The most interesting bird life observed was a mixed flock of shore birds, consisting of sanderlings, ruddy turnstones, and three black-bellied plover, and then about three miles up the beach we found a small colony of least terns.

On returning to town and talking to some of the residents we were informed that we would be apt to find birds more abundant to the south of town beyond the inlet, a trip that would have to be made in a boat. We therefore made arrangements for a boat at 5:30 the following morning.

After a night on the beach under a full moon and a dip in the

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author details the various methods used to collect and analyze the data. This includes both primary and secondary data collection techniques. The analysis focuses on identifying trends and patterns within the dataset.

The third section presents the results of the study. It includes several tables and graphs that illustrate the findings. The data shows a clear upward trend in the number of transactions over the period studied.

The fourth section discusses the implications of the findings. It suggests that the observed trends could be due to several factors, including changes in market conditions and consumer behavior. Further research is needed to confirm these hypotheses.

The fifth section provides a conclusion and offers recommendations for future work. It suggests that implementing more robust data collection systems could improve the accuracy and reliability of the information.

Finally, the document includes a list of references and a bibliography. These sources provide additional context and support for the research presented in the paper.

The author expresses their gratitude to the participants and funding agencies that made this research possible. They also acknowledge the limitations of the study and the need for further investigation in this field.

ocean, we were ready for our bacon and eggs. At 5:30 we were at the appointed place, and after our equipment was stowed away in the bow of the boat we were soon putt-putting over the quiet waters of Sinepuxant Bay. Some three miles down the Bay we came to the location of the old inlet, where we were told we would find a colony of "strikers", the local name for the small gulls and terns, and "flood gulls", black skimmers. We were not disappointed, for there we found a large colony of least and common terns and a few black skimmers.

The following is a list of the birds observed.

Double-crested Cormorant, *Phalacrocorax a. auritus*. Two "nigger geese" were flushed from pond net stakes on the morning of June 16 in Sinepuxant Bay.

Great Blue Heron, *Ardea h. herodias*. On June 16 fresh tracks were seen in the soft mud of the tidal marshes, exposed by the ebbing tide.

American Bittern, *Botaurus lentiginosus*. One was seen to the north of town on June 15.

Black Duck, *Anas rubripes tristis*. Two were seen. Kirkwood saw a female with young.

Turkey Vulture, *Cathartes aura septentrionalis*. Common.

Marsh Hawk, *Circus hudsonius*. On June 15 one was seen flying low over the tidal marshes.

Osprey, *Pandion haliaetus carolinensis*. Common. A few nests were seen, one on the top of a tepee of old pond net stakes, though it was not occupied.

Piping Plover, *Charadrius melodus*. A few were seen; Kirkwood saw a female with two young.

Killdeer, *Oxyechus v. vociferus*. One was seen and heard on the 16th.

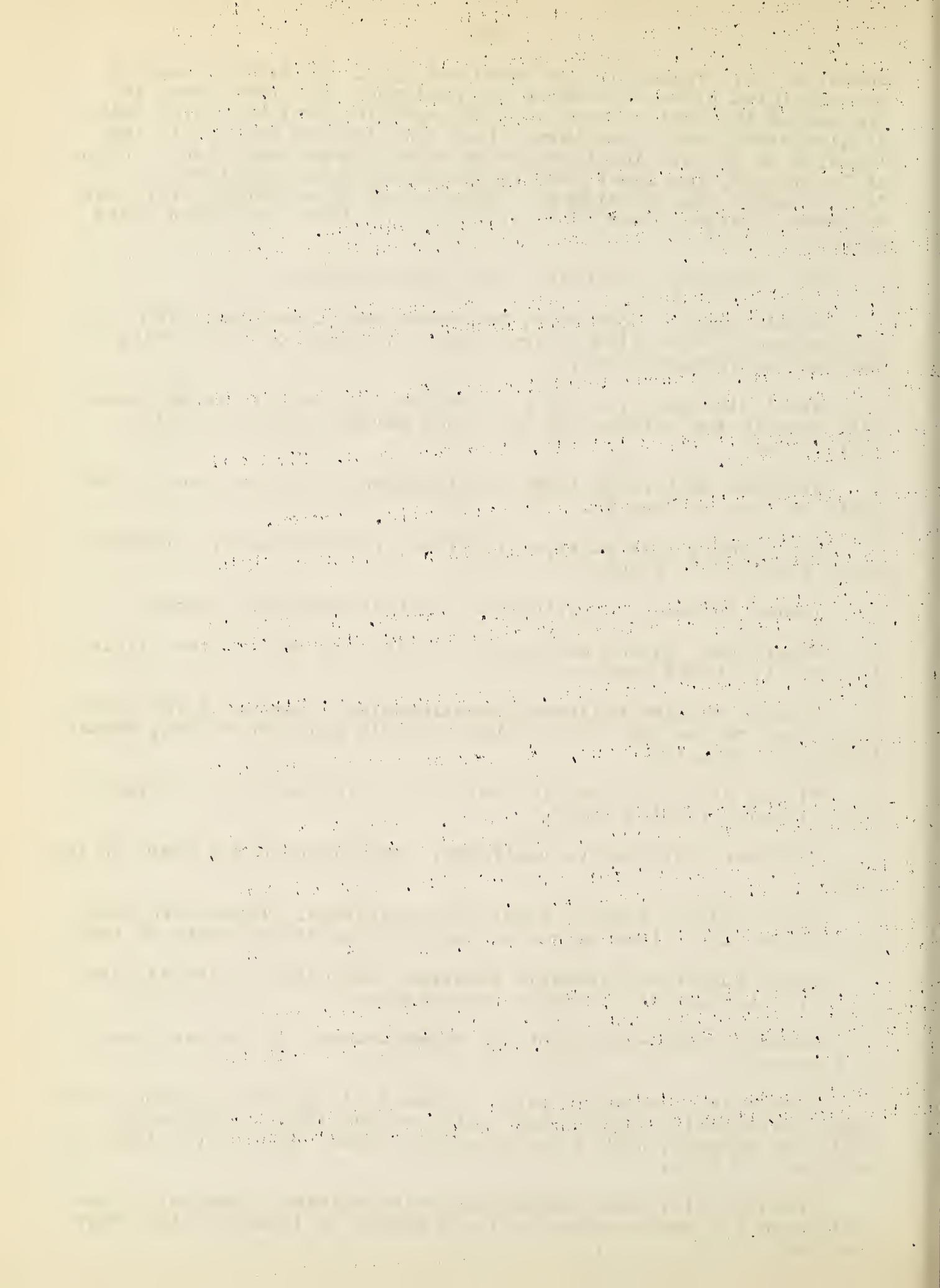
Black-bellied Plover, *Squatarol squatarola*. Three were seen on the 15th in a flock of sanderlings and turnstones north of town.

Ruddy Turnstone, *Arenaris interpres morinella*. Several were seen on both days in flocks of sanderlings.

Greater Yellow-legs, *Totanus melanoleucus*. A few were seen by Kirkwood.

Sanderling, *Crocethia alba*. A small flock with turnstones and three black-bellied plover was noted on the 15th. A flock of fully one hundred, with a few turnstones, was seen on the 16th to the south of town.

Herring Gull, *Larus argentatus smithsonianus*. Common. Abundant about the harbor, where a large number of immature birds were observed.



Ring-billed Gull, *Larus delawarensis*. Common, though not as abundant as the herring gull.

Laughing Gull, *Larus atricilla*. Common. We were disappointed in not finding some of their nests.

Common Tern, *Sterna h. hirunda*. The most abundant tern. Their nests, hollows in the sand, were usually beside pieces of driftwood, or among clumps of grass. Each contained two or three eggs in various stages of incubation, and a few young had just hatched. No attempt was made to count the number of nests, though we estimated that there were about 200.

Least Tern, *Sterna a. antillarum*. A small colony which contained three nests of three eggs and six of two was found to the north of town on June 15. On June 16 we noticed another small colony on a point across the inlet but we did not visit it. The larger colony was found on the wide expanse of sandy beach where the old inlet used to be. There the nests were, as usual, only a slight hollow in the sand with no protection. Often the nests were so close together and the coloration of the eggs so harmonized with the small pebbles and sand of the beach that we had to watch closely where we stepped. Fourteen nests contained one egg, fifty-three nests two eggs, and three nests three eggs. Most of the eggs were well incubated and a few chicks were hatched.

Caspian Tern, *Hydroprogne caspia imperator*. Several were seen on a pile of sand near the dock on June 16.

Black Skimmer, *Rynchops n. nigra*. Nests of this bird were found among those of the least and common terns, though they were few and far between. They were also only depressions in the sand, but somewhat deeper and with the sand that had been pushed out banked up about the edge of the hollow. Nine nests of four eggs, and one which contained one egg were found, all fresh. There were many unoccupied nests, and we believe that they had just started to nest.

Chimney Swift, *Chaetura pelagica*. A few were seen flying over town on the evening of the 15th.

Barn Swallow, *Hirundo erythrogaster*. Several were seen on the afternoon of the 15th, and a few early in the morning of the 16th.

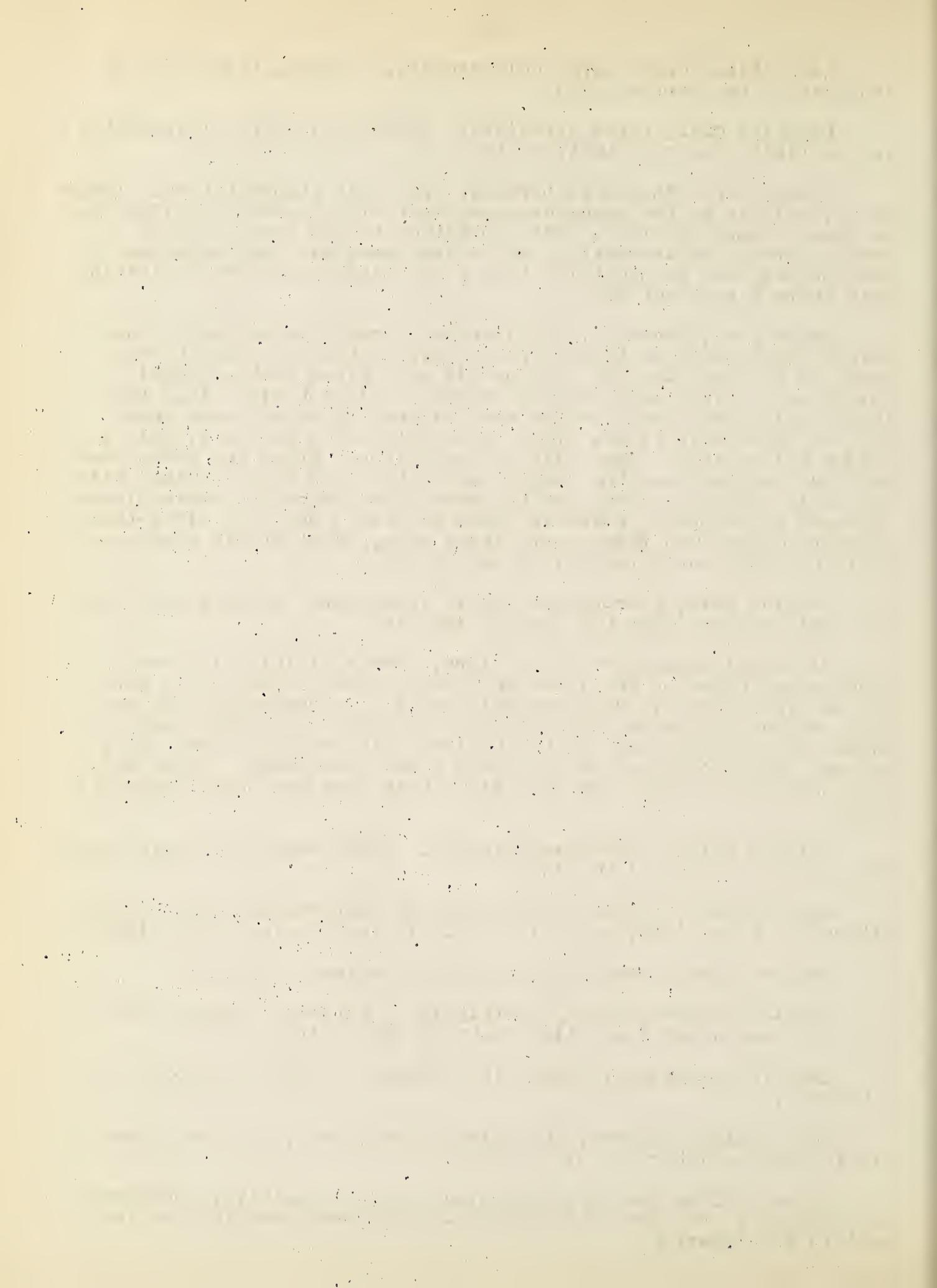
Eastern Crow, *Corvus brachyrhynchos paulus*. Common.

Maryland Yellow-throat, *Geothlypis t. trichas*. One was seen in some brush about four miles south of Ocean City.

Eastern Meadowlark, *Sturnella m. magna*. A few were noted on both days.

Sharp-tailed Sparrow, *Ammodramus c. caudacuta*. Seen and heard singing on the afternoon of the 15th.

Atlantic Song Sparrow, *Melospiza melodia atlantica*. Observed on both days. The song was noticeably different from that of the Eastern Song Sparrow.



NOTESMeetings and Lectures at the Society

December 3 - Talk by Mr. W. Bryant Tyrrell, "Birds of Smith Point."

December 10 - Lecture by Dr. Mark H. Secrist of Johns Hopkins University, "The Antiquity of Man." Illustrated.

December 17 - Talk by Mr. Joseph A. Lutman, "The Copper Plating of Fish." Illustrated.

Lectures to Outside Organizations

December 5 - To Boy Scouts Club of Baltimore City College by Mr. Elra M. Palmer, "Fossils and What They Are."

December 12 - To the Biology Club of Baltimore City College by Elias Cohen, "Snakes of Maryland."

December 17 - To the Southern High School Science Club by Richard Webster, "Representation of the Insect Orders"

December 19 - To the Boy Scouts Club of Baltimore City College by Elias Cohen, "Reptiles of Maryland."

Other Meetings

December 7 - Junior Meeting - Lecture by Mr. Elra M. Palmer, "Fossils and What They Are."

December 28 - Staff Meeting.





**BULLETIN**

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Volume VI

JANUARY, 1936

Number 5

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THE BENTHARIUM-CONSTRUCTION

By Joseph C. White

For several years the Department of Marine Research of this Society has been actively engaged in diving for the purpose of studying the life of the Chesapeake Bay. The helmet or hood was the first type of diving equipment used, and much has been written about the work with this apparatus.

After working for sometime under the water there came a time when photography was found to be a great help to the Department's work. There were other things too that could not be done very well in a helmet. Notes could not be written easily and it was very difficult to stay below the surface for any great length of time due to the coldness of the water.

To overcome these difficulties it was decided to build a tank in which a man could sit, dry, the pressure no greater than that on the surface, with note books and cameras nearby, ready for use. The plans called for a cylinder of one-quarter inch steel, four feet in diameter and six feet in length, with a circular opening in the side for an observation window and one in the top for a manhole. A tank was finally secured with the circular opening in the side, but the manhole in the top had to be cut. The manhole was an oval, twenty-four inches long and fourteen inches across. Holes were drilled about two and one-half inches apart all around the opening. The cover was made of half inch steel with bolts to correspond to the holes that had been drilled around the manhole. A rubber gasket was placed on the cover next to the tank and the cover tightened down from the inside by means of dogs.

The observation window was made of three-quarter inch plate glass set in a wooden frame twenty-seven inches in diameter. This was strengthened on both sides by steel rings and between these various sections, rubber gaskets were placed. This was firmly bolted to the flange on the tank by half-inch steel bolts. (See drawing). One piece of glass was broken in assembling the observation window because of an error in making the frame for the glass.

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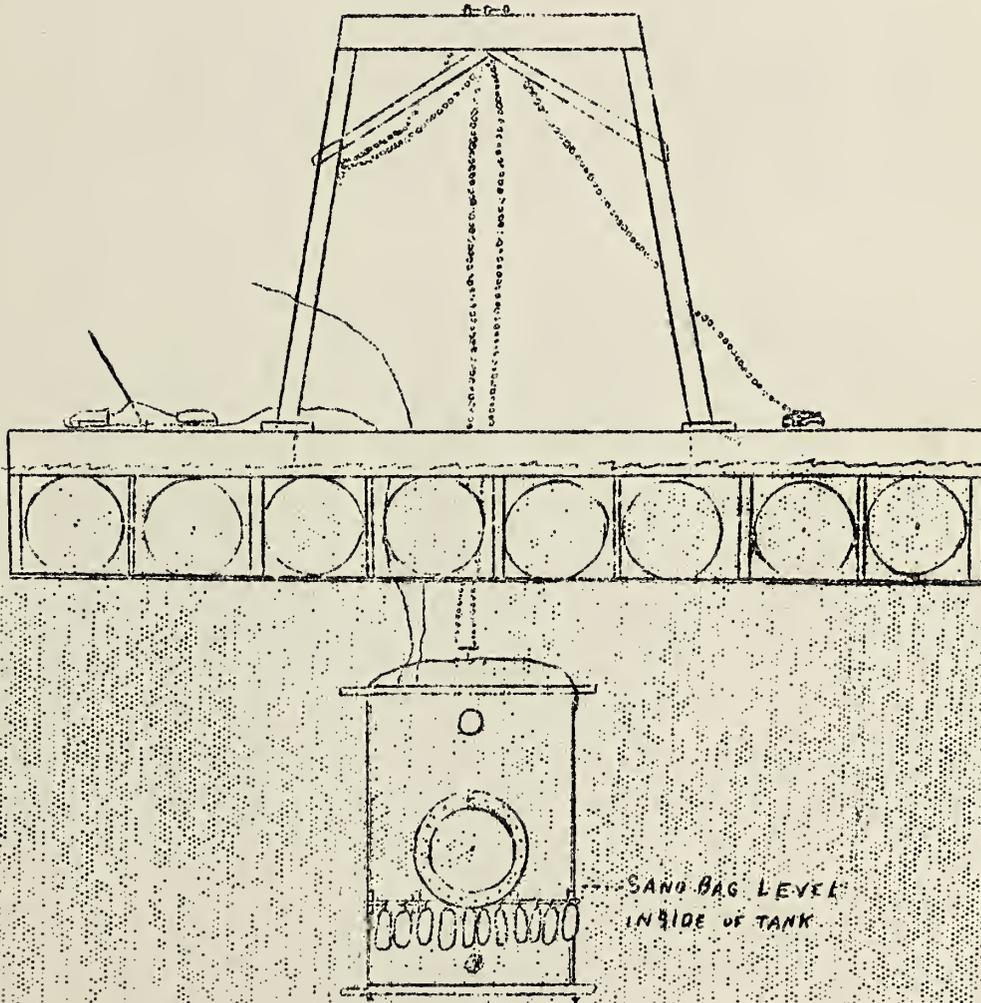
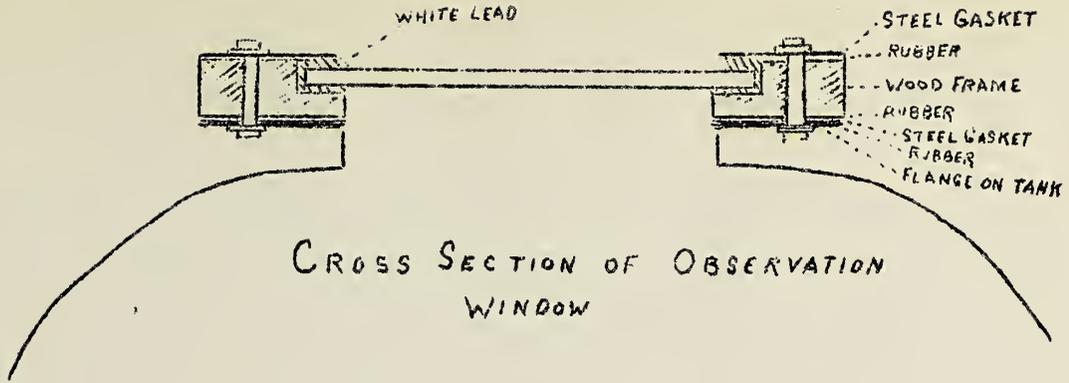
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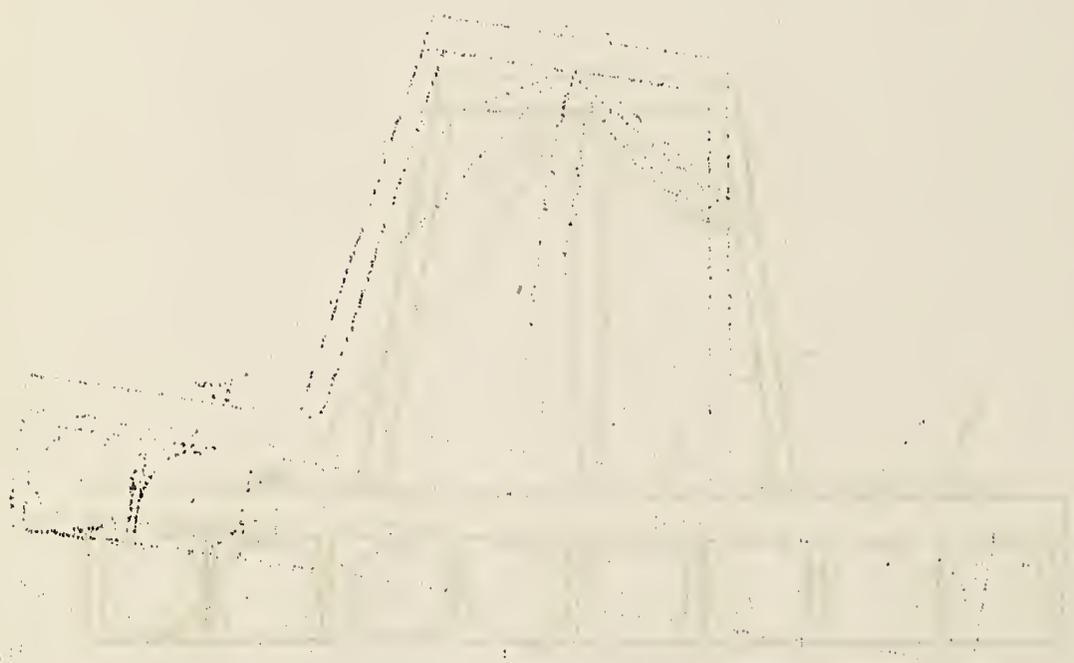
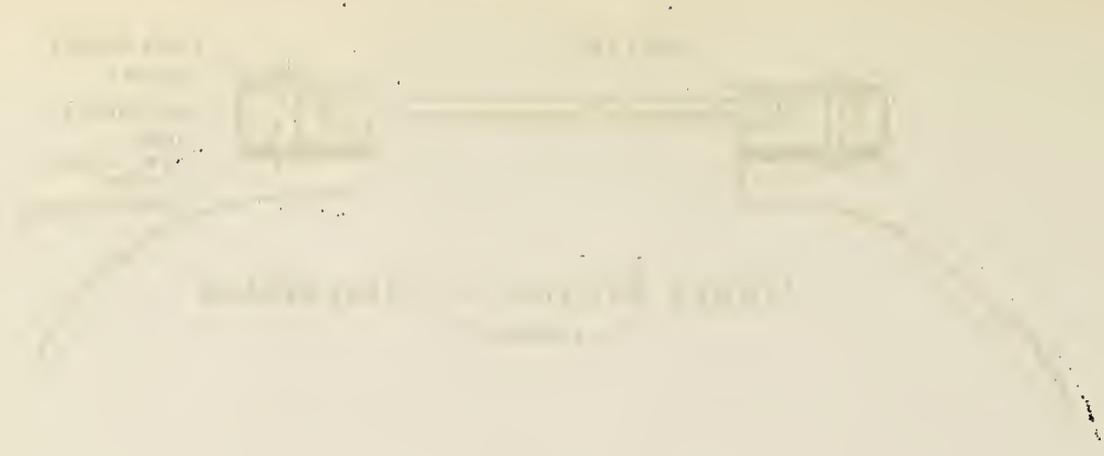
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DIAGRAMMATIC SKETCH OF THE BENTHARIUM



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The glass was fitted flush with the wood allowing no space for contraction of materials. Naturally when the part was bolted to the flange, which was found to be crooked, the glass cracked in several places. After buying a new piece of glass and making a new frame with the groove a quarter-inch deeper than the glass and filling it with white lead, the observation window was successfully fastened on the tank.

Running lengthwise around the tank was a flange where the two halves had been bolted together. Around this a sling was placed. Across the bottom a U beam was placed and at the top were two angle bars, one on each side of the flange. Two three-quarter inch iron rods were bent in the shape of large U's. One of these was passed through holes drilled in the ends of the angle bars at the top, down the side of the tank close to the flange, and the two ends passed through holes in the U beam at the bottom. The ends of the rods were threaded and by placing nuts on the rods and tightening up under the U beam the sling was drawn up tightly around the tank. The other rod was placed on the other side of the flange in the same manner. At the top of the tank the two rods were pulled together and fastened, and the hook of the chainfall placed in the center. (See drawing).

The raft for carrying the Bentharium is twenty feet long and fourteen feet wide. Eight metal drums were placed under each side to float it, leaving the center open for the tank. Around the outside edge of the raft is a deck from which all the work can be done with little difficulty. Over the well in the center is a derrick from which the tank is hung. The heavy tank is raised and lowered by a  $1\frac{1}{2}$  ton chainfall.

Two hundred and seventy bags of sand weighing approximately three thousand, two hundred and forty pounds were used to sink the Bentharium. Most of the bags were placed inside the tank, filling it up to the window. The remainder of the ballast was hung on an iron rod around the outside below the window.

The construction of the tank took two years. At times our work did not come up to the qualifications that safety or our needs demanded and work was consequently delayed. Almost an entire day was spent cutting rubber gaskets and fitting the first window on the tank, only to have it break in the end. All this day's work had to be done over. But after two years' work the tank was finished and proved to be very successful.

In a later Bulletin an article will be published describing some of the experiments conducted at Solomons Island with this equipment.

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## SOME CLOSELY RELATED BUTTERFLIES OF EUROPE AND AMERICA

By Eugene R. Polacek

Some of my fondest memories of boyhood days are associated with that colorful valley in the heart of Württemberg (Germany), surrounded on every side by mountains of singular beauty. There

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in the midst of the valley nestled the thriving city of Stuttgart, the smoke of its factories blending with the purple haze of the surrounding hills.

In those early days I acquired a love of natural history, which has lasted through the years. Then much later in the new world and particularly here in Maryland I have enjoyed many unforgettable days tramping the woods and meadows, fascinated by the beauty of its wild life.

Though both are in the temperate zone and have many things in common, there are marked climatic differences in these widely separated cities; Baltimore, with its tidewater harbour, has an extremely damp though moderate climate, while in contrast, Stuttgart, located 820 feet above sea level, 500 miles inland, is mild in summer, severely cold in winter, and has always a low humidity.

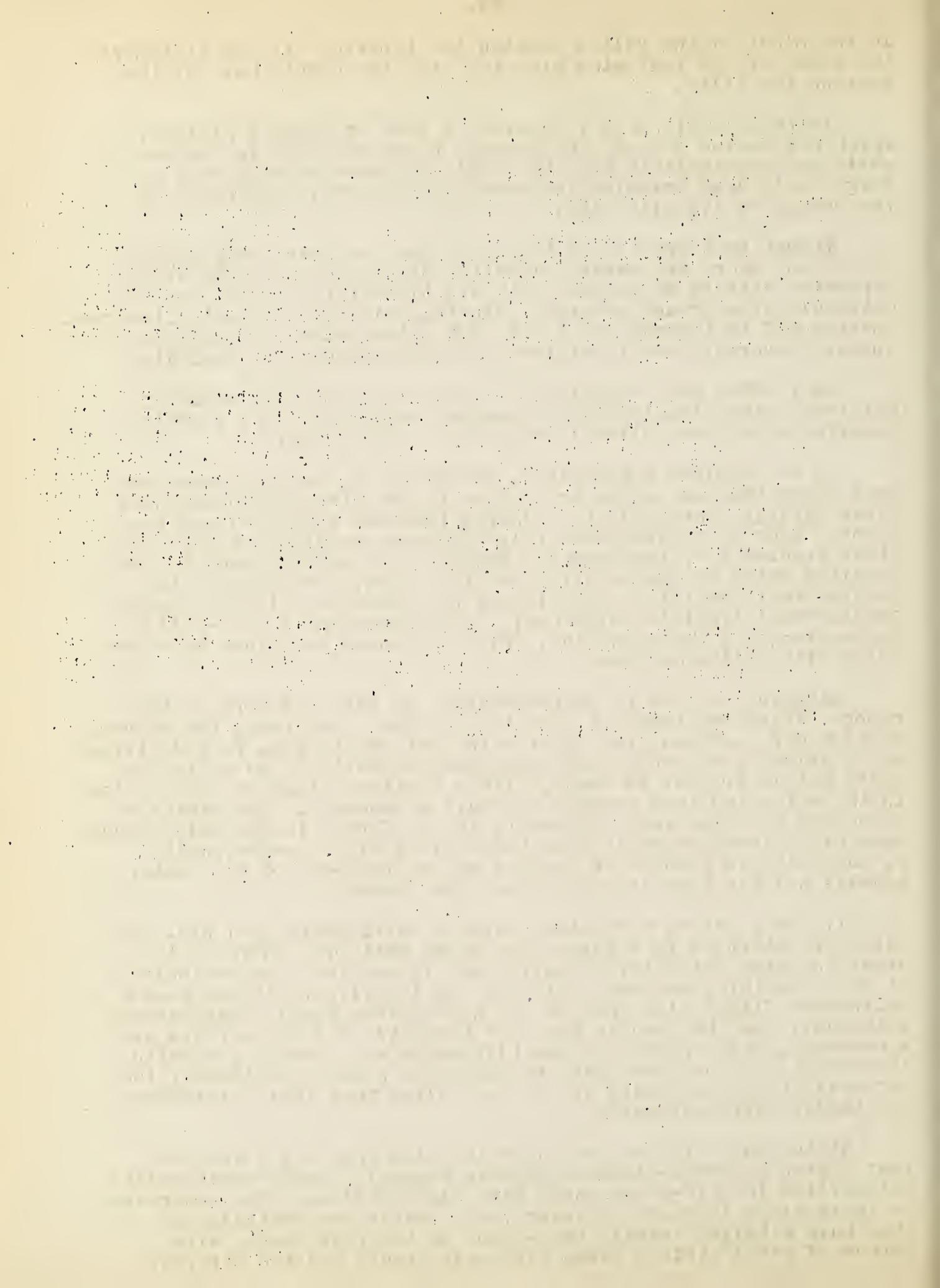
As I often have occasion to compare species indigenous to Baltimore with closely related species across the sea, I notice the effects of these climatic and other differences.

If we consider butterflies, for instance, we find there are many there that are known to us here in the States: the Mourning Cloak (*Aglais antiopa*), the Admiral (*Vanessa atalanta*) and the Painted Lady or Thistle Butterfly (*Vanessa cardui*), but there are other species too, representing families and genera found in our locality which are quite different from ours. For example the Swallow-tail (*Papilio machaon*), may be contrasted with our Carrot Swallow-tail (*Papilio polyxenes*). The former has a gold-yellow base-color with black margins, while *polyxenes* has black as a base-color with yellow margins.

Maryland is rich in Swallow-tails, in fact far more so than Europe, which can boast of only two species - one being the already mentioned *P. machaon*, the other - the Sail-butterfly, *P. podalirius*, which slightly resembles our Zebra Swallow-tail (*P. marcellus* or *ajax*) but is broader in shape, with a distinct tinge of cream color in the white and less accentuated tail appendages. The habits of these two are also very different, as the former is generally found near high bleaky rocks at most times difficult to reach, while *P. marcellus* is found near springs and at the edge of open waters, usually not far from its food plant the Paw-Paw.

If you go along a woodland-path in Württemberg, you will most likely be startled by a large dark brown butterfly known as the Great Ice-bird (*Limenitis populi*), but if one is an entomologist, at once something becomes noticeable in its flight; it has a slow deliberate flight like that of our Red-spotted Purple (*Basilarchia astyanax*). As the generic names of *Limenitis* and *Basilarchia* are synonymous, this proves our identification as correct, for while the coloring is not much like the American species mentioned, the caterpillar and chrysalis are so much alike that their differences are hardly distinguishable.

At the edge of the woods near the clearings are found the fast flying Emperors-Cloaks (*Argynnis paphia*), pretty medium-sized butterflies in gold-brown coats with black stripes. The underside of their wings is worth noticing too. Unlike our Fritillaries they have a bright emerald base-color on the rear wings, with mother of pearl stripes mixed with pale orchid colored stripes,



and so give full justice to the popular name. However, these markings, as well as the color on the under side of the rear wings, show quite a contrast to our Great Spangled Fritillary (*Argynnis cybele*) though both feed on the leaves of the violet, like most of the Silver-spots. The upper side of the front wings has brown as a base-color, but this brown varies quite frequently in shades, and the black markings are more or less in the shape of irregular spots and not in stripes radiating from the base as in *A. paphia*. Also the under side has buff in shadings as a primary color and the mother of pearl there on the rear wings appears in the shapes of triangles and moons.

There are many other butterflies in Europe, as well as moths, which might be compared with those of Maryland. The reasons for the differences or similarities in habits, color, and structure provide a very interesting field of study for the entomologist.

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### A BOTANIST IN NANJEMOY SWAMP

By Earl H. Palmer

Some botanically minded members of the Natural History Society's Paleontological Expedition last summer to the cliffs of the Potomac, spent an afternoon in the upper basin of the Nanjemoy Creek. Nanjemoy, one of the numerous streams of Charles County, Maryland, has cut its way through the loose sandy-formations of the coastal plain regions of Southern Maryland to the Potomac River. The lay of the land was none too well known to most, if not to all of us, so that we had to depend for guidance largely on United States Topography maps.

We parked our car at Trappe Bridge near the village of Nanjemoy, on the main road about five miles from Riverside, where the rest of our party were engrossed in their paleontological investigations, and turned down stream in search of what-ever-of-interest in the plant world that might turn up. Just below Trappe Bridge the creek reaches its base level. Here too, its bed broadens out between hills which rise rather abruptly at first, then more gradually, to a height of from 60 on the south to 100 feet on the north, and the stream tends to divide and interlace, forming a marshy flood-plain of varying width and firmness. Here our study of the plants began.

The most conspicuous of the herbaceous plants was the Green Arrow-Arum (*Peltandra virginica*). In one instance a specimen was found to be approximately 4 1/2 feet high, the leaves measuring nearly 2 1/2 to 3 feet long and 8 to 12 inches broad. Another plant that was very conspicuous because of its bright cardinal flowers was the Cardinal Flower (*Lobelia cardinalis*).

The five of us in the party spread out fan-wise soon after entering the Nanjemoy Swamp so that a larger area could be surveyed. First, we would hear some one call out, "This *Lobelia* is the tallest, brightest I've ever seen!" From some other direction there would come a shout, "What's this?" And going over to satisfy our natural curiosity we would see an unusual form of May Apple

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or perchance a strange *Hypericum*. Suddenly, we heard a triumphant shout as some one found the first Orchid - a Small Green Wood Orchis (*Habenaria clavellata*) - the plant was in seed.

The first new find of the day came when, by mere accident, the writer stumbled into a colony of Small Pale-green Orchis (*Habenaria flava*). The small flowers at first seemed to be a seed pod, but not for long were we deceived; several specimens now rest in the Society's herbarium. This find was quickly followed by an Iris (*Iris versicolor*) and that, by a small group of Lady Slippers (*Cypripedium acaule*) in seed. The large oval leaves of the Lady Slipper, resting on the ground, make this plant easy to identify.

In the places not quite so wet we ran across such ferns as the Chain Fern (*Woodwardia areolata*), the New York Fern (*Dryopteris noveboracensis*), and the Low Land Lady Fern (*Athyrium angustum*). In the same region we came across one of the rarer plants, the Crane-Fly Orchis (*Tipularia discolor*). This particular species was so named because of its resemblance to the insect Crane-fly or Tipulia. The flowers are small and greenish-brown in color, borne on a stalk devoid of leaves. They are quite inconspicuous against the green and browns of the wood. The leaves of the species are put forth in autumn and by spring are brown and dry, and have disappeared altogether by the time the flowering scape has developed and the flowers opened.

Of the fifty odd herbaceous plants observed, the rarest appeared near the end of our explorations. We had been examining several Orchids - five different species to be exact - (and that's a great many for any one locality) when we spied what at first looked like another Orchid. But, on closer observation a spore bearing spike was noted. The plant was the very rare Adder's Tongue Fern! (*Ophioglossum vulgatum*). There were only two plants, about 12 or 18 inches apart, and though we looked carefully for others, none was found. But this find was certainly a very good ending for the afternoon, for although rather widely distributed in Maryland, few local botanists have been so fortunate as to find it.

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#### NOTES

##### Meetings and Lectures at the Society

January 7 - Talk by Mr. A. Llewellyn Jones, "The History of Copper."

January 14 - Talk by Mr. C. Haven Kolb, Jr., "Feathers and Their Structure."

January 21 - Talk by Mr. Gilbert C. Klingel, "Poetry and Nature."

January 28 - Talk by Mr. Wilmer T. Bell, "Structural Color

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in Natural Objects."

January 16 - Visit of Boy Scouts of America, Troops 23, 100, and 156 of the Harford Road District. Lecture by Mr. Edmund B. Fladung, "Natural History Rambles through River, Swamp, Forest, and Field."

January 18 - Junior Meeting - Lecture by Mr. Edmund B. Fladung, "Hunting with the Camera."

January 11 - Trustees Quarterly Meeting. Appointment of the Nominating Committee - Mr. Gilbert C. Klingel, Mr. Edward McColgan, and Mr. Herbert C. Moore. Appointment of the Budget Committee - Mr. John B. Calder, Mr. Edmund B. Fladung, and Mr. Elra M. Palmer.

#### Lectures to Outside Organizations

January 17 - To Boy Scout Troops, North Avenue District, by Mr. Gilbert C. Klingel, "Inagua."

January 21 - To the Sportsman's Luncheon Club by Mr. Gilbert C. Klingel, "Exploring the Bottom of the Chesapeake."

January 21 - To the Bancroft Literary Society by Mr. Elra M. Palmer, "Fossil Collecting in Maryland."

January 24 - To the Current Events Club of Baltimore City College by Mr. Elra M. Palmer, "Geological Trails in Maryland."

January 29 - At the Citizens Conservation Camp, Elkridge, Maryland, by Mr. H. C. Robertson, "Snakes of the World."

#### Gifts

Received from Dr. G. Howard White a collection of volumes of the "Maryland Geological Survey."

The first part of the document is a letter from the Secretary of the State to the President, dated 18th March 1862. It contains a report on the progress of the war and the state of the Union.

The second part of the document is a letter from the President to the Secretary of the State, dated 20th March 1862. It contains a reply to the report and expresses the President's views on the war.

The third part of the document is a letter from the Secretary of the State to the President, dated 22nd March 1862. It contains a report on the progress of the war and the state of the Union.

The fourth part of the document is a letter from the President to the Secretary of the State, dated 24th March 1862. It contains a reply to the report and expresses the President's views on the war.

The fifth part of the document is a letter from the Secretary of the State to the President, dated 26th March 1862. It contains a report on the progress of the war and the state of the Union.

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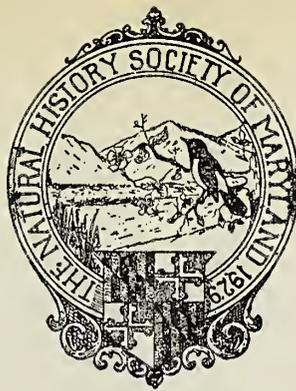
The seventh part of the document is a letter from the Secretary of the State to the President, dated 30th March 1862. It contains a report on the progress of the war and the state of the Union.

The eighth part of the document is a letter from the President to the Secretary of the State, dated 31st March 1862. It contains a reply to the report and expresses the President's views on the war.

The ninth part of the document is a letter from the Secretary of the State to the President, dated 1st April 1862. It contains a report on the progress of the war and the state of the Union.

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*The Natural History*



*Society of Maryland*

**BULLETIN**



Volume VI

FEBRUARY, 1936

Number 6

THE LIFE HISTORY OF THE KING SNAKE  
(*Lampropeltis getulus getulus*)

By H. Charles Robertson

While strolling through the woods and fields in Maryland one is likely to be startled by the sight of a large black serpent hurriedly taking to shelter after being frightened by the presence of the intruder.

If one is interested, closer observation will disclose that the snake is not entirely black, being crossed with narrow white bands which give it a rather striking appearance. It may even be picked up for examination, for it is a King Snake and is perfectly harmless.

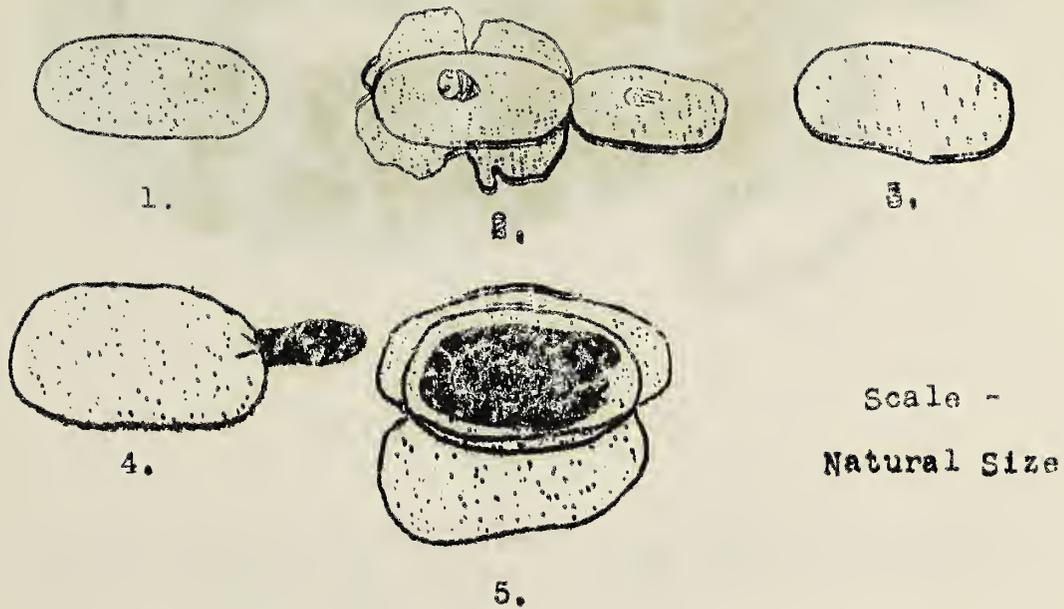
The King Snake (*Lampropeltis getulus getulus*) is the only serpent in the State that has a black ground color and is marked with white cross-bands. In some sections it is known by another local name - the "Chain Snake", due to the pattern made by the bands resembling a chain entwined about the body.

King Snakes may be observed in Maryland from the latter part of April to late in September. In the southern sections of the State they are occasionally noted late in the month of October. The species is considered the most beneficial reptile to the agriculturist that is found in Maryland. To the student of reptiles it is certainly one of the most interesting.

The general range of the King Snake is from southern New England to northern Florida. In Maryland it is moderately abundant and is well distributed over the State.

A description follows. In Maryland the coloration is a black ground with narrow white cross-bands that fork on the sides forming the chain-like pattern. The bands as a rule are two scales wide. The underside is black with blotches of white. The scales are in twenty-one rows and are smooth and shiny. Light shining upon the scales is reflected, giving off prismatic colors. The eye is of normal size, has a dark brown iris, and a round black pupil.





1. Egg at time of deposit.
2. Egg at time of deposit showing embryos.
3. Egg two days before hatching.
4. Egg, hatching.
5. Showing position of snake in figure 3.



Baby King Snake  
Natural size



Fig. 1



Fig. 2



Fig. 3



The King Snake     $\frac{1}{2}$  X.

In Maryland the average length of the species is from two and a half to three and a half feet. A large male collected in Harford County, May 11, 1933, measured as follows:

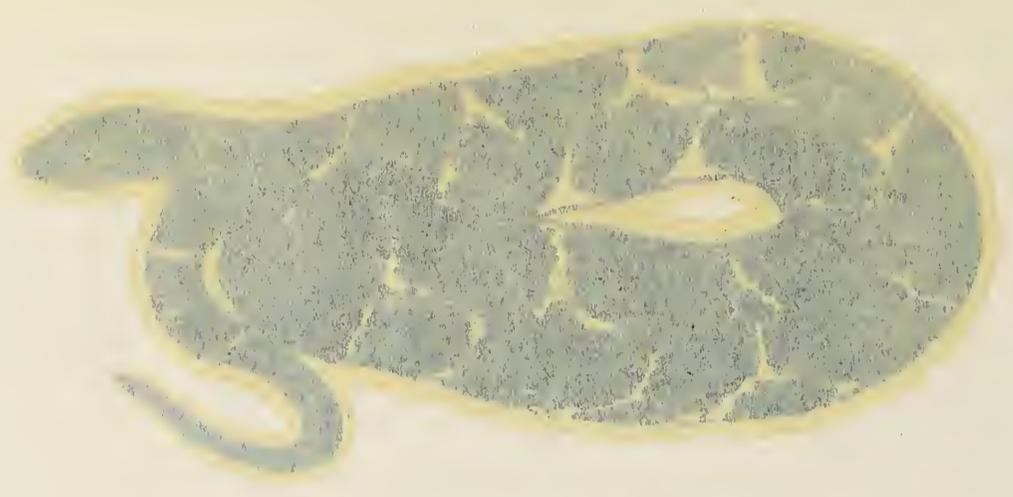
Total length	$57\frac{1}{2}$ "
Length of tail	$7\frac{1}{2}$ "
Greatest diameter	$1\frac{1}{4}$ "
Width of head	$7\frac{7}{8}$ "
Length of head	$1\frac{5}{8}$ "

In Florida where this serpent attains its greatest length, a variation in color, which is constant, takes place. The cross bands instead of being white are yellow.

The King Snake has a cannibalistic nature, and is more of a cannibal than the other species found in the genus. Toward serpents of another genus it exhibits active enmity even if the other serpent is larger. When it meets another member of the serpent clan there usually follows a battle to the death. In most cases the King Snake is the victor.

With a disposition such as this it would appear that they would not be at all gentle toward man, but this is not the case, for the King Snakes are extremely gentle and sometimes act as if they enjoyed being handled. They make very interesting pets and live in captivity for years. I know of one specimen that was so kept for over twelve years.

The poisonous rattlesnakes and copperheads have no chance of surviving an attack by a King Snake inasmuch as their deadly venom, usually such a potent weapon, has no effect upon the powerful constrictor. The King Snakes are immune to the venom of these pit-vipers. It is because of this unique immunity as well as its cannibalistic habits that the serpent receives its name the "King Snake."



The King Cobra

The King Cobra is the largest of the snakes of the Indian Archipelago. It is found in the mountains of the Malay Peninsula, Sumatra, Java, and the Philippines. It is a highly venomous snake and is feared by the people of the region.

Length of body	6 to 8 feet
Length of tail	1 to 2 feet
Weight of body	10 to 20 pounds
Color of body	Dark brown above, lighter below
Color of hood	Light brown with dark spots

The King Cobra is a highly venomous snake and is feared by the people of the region. It is a highly intelligent snake and is known for its ability to climb trees. It is also known for its ability to change its color to blend in with its surroundings.

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Laboratory experiments show that King Snakes can be injected with venom of the pit-vipers and suffer no ill effects. The same experiment carried out on a serpent of another genus would cause the death of the serpent in a short time, although the pit-vipers are immune to their own and each others poison.

It is generally believed that the King Snake is the natural enemy of the rattlesnake. This is not true. When a rattlesnake and a King Snake meet it is just by chance, for the King Snake prefers rodents as food, and a good sized specimen will destroy about one hundred and fifty destructive rodents in a season. It never actually searches for other serpents when there is a fair supply of rats and mice to be had as food. Truly, a serpent of this type is of more value to the farmer than all the rodent traps he can buy. Often it goes down into the burrows of the rodents and destroys not only the adults but any young it finds.

The King Snake is oviparous, that is, it produces eggs.

In the fall of the year the serpents go into hibernation for the winter. How and where they hibernate depends upon the type of locality in which they live. Maryland affords many different types of hibernation quarters and therefore any very close, accurate observations are difficult. Some may hibernate in an old log or hollow tree. A place such as this gives excellent insulation from the deadly frost during the winter. In rocky sections the serpents find crevices that go far down below the frost line, and they often coil about each other to create mutual warmth.

Serpents are sometimes found entangled in a ball shaped formation. Workmen engaged in the building of roads, where blasting of rock uncovers hibernating dens, occasionally find them so arranged.

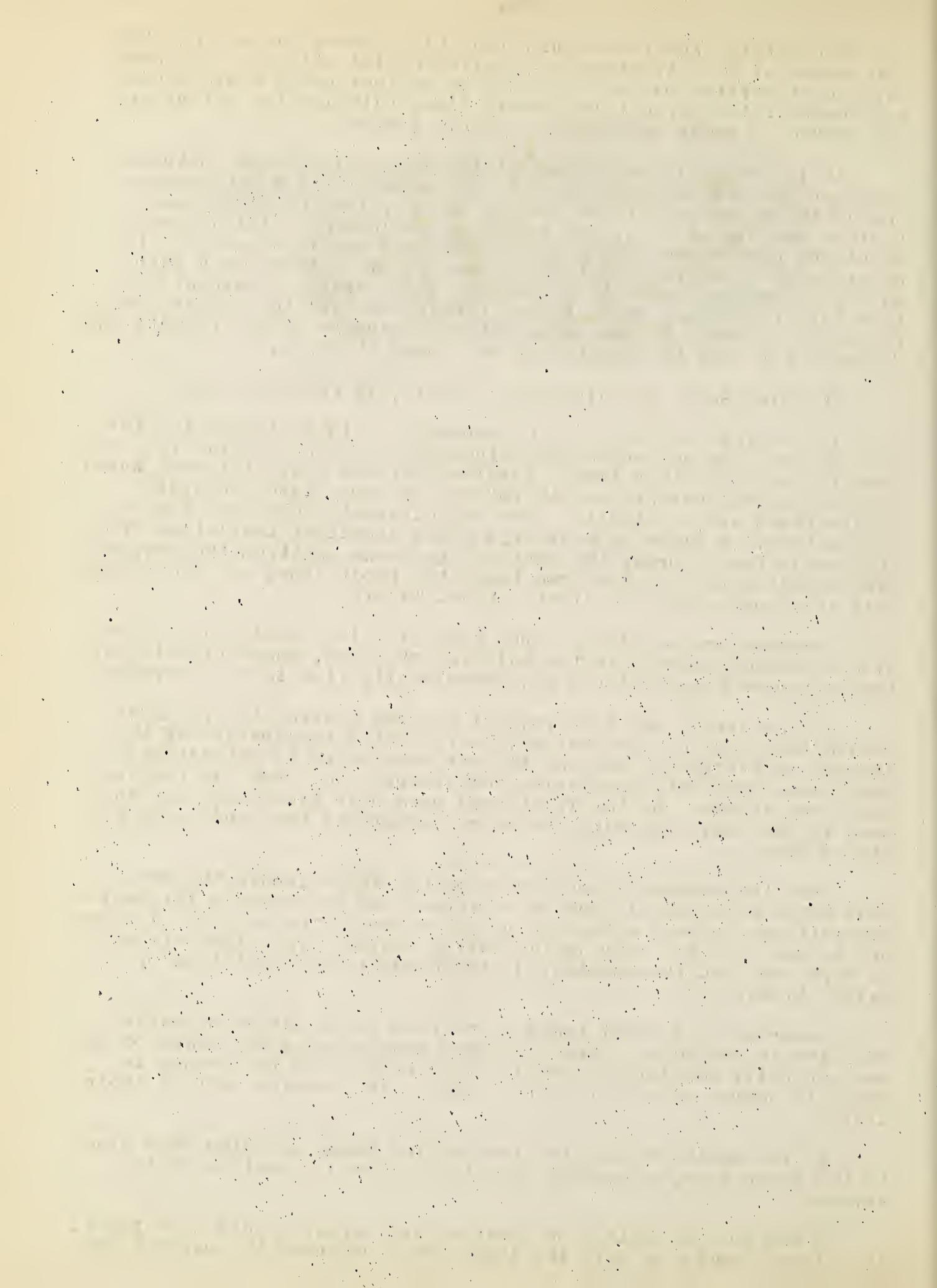
In the spring the warm rays of the sun heating the rocks or hollow tree, as the case may be, increase the temperature of the atmosphere within the den and the serpents begin to get active. Days pass, each with increasing temperature, and each day they become more active. On the first real warm days they crawl out and bask in the sun, returning to their quarters as the sun's rays begin to fade,

When the weather becomes warm enough they discard the dens - dens which have been in use as a winter home by serpents for many generations, perhaps a hundred years or more. The serpents are now off to seek a mate. May is the mating season. The night air may be very cold and then shelter is taken under low vegetation or fallen timber.

Never do they start hunting for food until after the mating function is completed. However, King Snakes under two years of age are not fully developed sexually. The balance of the season is spent in search of rodents which make up the greater part of their diet.

In the month of July the female King Snake deposits from nine to two dozen eggs, depending upon the size and condition of the serpent.

A two and one-half foot specimen was captured near Cove Point, in Calvert County on July 12, 1935. When captured the serpent had



been at the base of an old stump where there was a large quantity of wood pulp. Some of the wood pulp was placed in a container, and, on the following day, the serpent deposited therein nine eggs in a zig zag fashion from the top to bottom. She lay coiled on the surface above the eggs. In the natural state the eggs are usually deposited close together to insure them as much warmth as possible.

I have never been able to determine if the female of the King Snake spends any time with her eggs after they are deposited in the hatching medium. Some of the larger oviparous serpents do this and, in such cases, the female has an increase in body temperature during her stay with the eggs.

On July the 13th - the date of deposit - the eggs measured 31 mm. in length. On the following day they were carefully packed in some of the wood pulp and taken to Baltimore, where they were placed in an improvised incubator which consisted of a one gallon all glass aquarium containing some of the damp wood pulp. Care was taken to keep the wood pulp from becoming soggy from excess water. A certain degree of moisture is necessary to hatch the eggs, but an excess of water would cause the eggs to solidify, commonly known as "drowning". Placed in the pulp also was a thermometer so that a temperature reading could be had at any time.

When possible, constant temperature is most essential, along with the proper degree of moisture to insure incubation. In this case constant temperature was not available and a natural condition where the temperature would drop at night was used instead. The average temperatures for the month of July were 80 degrees in the day and 65 degrees at night.

Measurements taken on the eighth of August showed that the eggs had increased in size to about 35 mm. in length. On September 7, another examination was made, and the eggs had increased to 40 mm. By this time it was noted that the eggs were developing "humps" and were no longer the original shape. This meant that the embryos were well developed and soon would hatch.

On the twenty-eighth of September the first one hatched. Two more appeared on the following day and by the thirtieth of the month all had hatched.

All of the young King Snakes measured at least nine inches in length. All had the colors and markings of the parent. No change of color takes place with this serpent. All survived and spent the greater part of the day trying to find an opening so that they could crawl away to freedom.

Food in the form of small salamanders and young Ring-Necked Snakes (*Diadophis*) was put in their cage. No attention was paid to the food. The next food offered was six small frogs (*Hyla crucifer*). The following day the little frogs had disappeared, and examination of the young serpents showed the tell-tale humps in their bodies. Fortunately this gave some idea as to what to feed them in their early life, for force-feeding so small a serpent offers many difficulties. Four months later they began to accept

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the salamanders and other small serpents.

One day a tightly coiled ball of King Snakes was noticed and it was found that one had attacked its brother, killed it, and had already swallowed about two inches. They were separated and the unfortunate victim was preserved in a museum jar. Both were ten inches in length. This incident suggests that their cannibalistic instinct is well developed at birth, since an abundant supply of food was in the cage.

At the time of this writing, the remainder of the young are all in a healthy condition. Their average length is now eleven inches, five months after birth. It is believed that this species, properly fed and under good conditions, grows about six inches a year until maturity.

Some localities in Maryland where the King Snake has been noted during the past four years follow: April 5, 1932 Near Crumpton, Queen Annes County; April 16, 1933 Brooklyn, Baltimore City; April 19, 1933 Severn, Anne Arundel County; May 11, 1933 Near Sweetair, Baltimore County; July 7, 1934 Lusby's, Calvert County; July 8, 1934 Prince Georges County; May 3, 1935 Glenartney, Baltimore County; July 12, 1935 Cove Point, Calvert County; August 15, 1935 Swanton, Garrett County; August 25, 1935 Kent County; September 7, 1935 Vineyard, Baltimore County; September 20, 1935 Ilchester, Howard County; October 12, 1935 Avalon, Baltimore County.

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#### NOTES

##### Meetings and Lectures at the Society

February 18 - Illustrated lecture by Dr. R. V. Truitt, "The Work of the Chesapeake Biological Survey."

February 4 - Meeting.

February 11 - Talk by Mr. Herbert C. Moore, "Advertisements, Chemical Ingredients of Products, and the Law."

February 25 - Talk by Mr. Robert Wheeler, "Geology and Religion."

##### Lectures and Services to Outside Organizations

February 4 - With Appalachian Trail Club, trip to Mt. Washington Copper and Chrome Mines, etc. Conducted by Mr. A. L. Jones.

February 17 - At the Gilman Country School, talk by Mr. H. C. Robertson, "Snakes of Maryland."

February 20 - At the State Normal School, talk by Mr. L. Bryant Mather, Jr., "What Maryland is Made of."

February 20 - At the Gilman Country School, talk by Mr. Elra M. Palmer, "Fossils of Maryland."

February 21 - To the St. John's Church Boy Scout Troop, talk by Mr. Elias Cohen, "Turtles of Maryland."

February 28 - To Civilian Conservation Corps, S.P. No. 2, Elkridge, talk by Mr. H. C. Robertson, "The Truth about Snakes."

February 28 - With Groups, Harford Road District, during month of February, by Mr. Frank O'Rourke, -twelve nature examinations and four field trips.

##### Exhibition

January 31 - February 7 At Enoch Pratt Library Branch. Exhibit of Reptiles and Turtles by Elias Cohen.

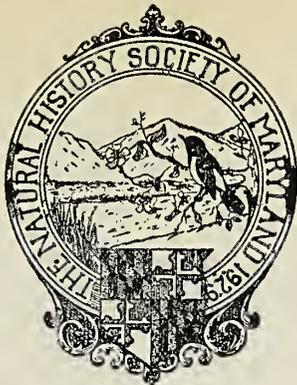
The first part of the document discusses the importance of maintaining accurate records of all transactions. It is essential for the company to have a clear and concise system in place to ensure that all financial data is properly documented and accessible. This will help in the preparation of financial statements and provide a clear picture of the company's financial health.

In addition, it is important to establish a strong internal control system. This involves implementing policies and procedures that are designed to prevent and detect errors and fraud. Regular audits and reviews should be conducted to ensure that the system is working effectively and to identify any areas for improvement.

The second part of the document focuses on the role of management in ensuring the success of the company. Management should be responsible for setting clear goals and objectives, and for providing the resources and support needed to achieve them. It is also important for management to communicate effectively with employees and to foster a positive work environment.

Finally, the document discusses the importance of staying up-to-date on industry trends and changes. Management should regularly monitor the market and identify any opportunities or threats. This will help the company to adapt to changing conditions and to maintain a competitive edge.

N315  
*The Natural History*



*Society of Maryland*



## BULLETIN

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Volume VI

MARCH, 1936

Number 7

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### THE MINERALS OCCURRING WITH THE BALTIMORE GNEISS OF BALTIMORE CITY

By Walter E. Price, Jr.

The Baltimore gneiss is a light gray, banded rock consisting of quartz, feldspar, and mica. The most striking feature of the gneiss is its banded character, which varies considerably. The layers of biotite and hornblende material persist straightly for some distance, and with the effect of the whitish and pink feldspar, give an appearance best described by calling it "salt and pepper rock."

The gneiss has been intruded by pink pegmatite and white granite, both cutting across the bedding plane. There have been two intrusions of pegmatite; the younger is characterized by the absence of biotite, while the older is heavily biotitic. In some places, as at Gwynns Falls, Baltimore, the gneiss contains more quartz, and because of this, it does not split as easily along the bedding plane as it does in the less quartzic variety. The gneiss has a series of right angled joints which permit it to be worked with facility. These joints allow the stone to be squared off easily, a property enhancing its value as a building stone. In Baltimore, the old Court House, some of the women's buildings of Goucher College, the old City Jail, and more recently, the new Fifth Regiment Armory, and the Druid Hill Park Lake wall, have been built of the Baltimore gneiss.

The gneiss outcrops in parts of both Howard and Baltimore counties, and these areas have been named accordingly. The minerals of the Baltimore area are discussed here. The north and west sides of the city are covered by the gneiss, and exposures have been made by quarrying. The two centers of quarrying of the gneiss in Baltimore City are at Jones Falls and Gwynns Falls.

Formerly these places were worked much more extensively than they are to-day. The presence of buildings and other property nearby has limited operations, and work has subsided in some parts of these valleys. The Jones Falls section was worked as early as 1811, as mentioned in a rare old journal of that time. During the last century many quarries existed at Jones Falls, the largest and



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most famous of which were the Peddicord, Curley-Schwind, and Atkinson. There are also old quarries in the Gwynns Falls area. At present there are only a few companies working in the gneiss of these sections.

At Jones Falls the Falls Road Stone Corporation operates a quarry on the east bank, just below the junction of Stoney Run with the Falls, between 26th and 28th streets, adjacent to an old quarry site where the Mt. Vernon Roundhouse now stands. Two quarries operate at Gwynns Falls at the present time, next to one another. The T. C. Campbell Company's Quarry is situated on the west bank of the Falls, about 500 yards north of the Pennsylvania Railroad bridge. Just a few hundred yards south of the latter, also along the bank of the Falls, is found the Hilton Quarry. This quarry has not been worked extensively of late.

A geological romance has grown around these two sections, and especially around the Jones Falls quarries. The mineral molybdenite was first discovered on this continent at the Jones Falls quarries in 1811; it was not of economic importance however. Also Tyson (1) a decade or so later, reports the occurrence of sphalerite and galena in a vein near chabazite, but they too were of no economic value, and their traces were soon lost on the dump heaps. Zinc and lead sulphides seemed to be rather rare, and in a later report in 1887, Williams (2) refers to Tyson's find. Watson (3) still more recent, mentions in his report about a cube of galena 4 inches on a side being found (1928) at Gwynns Falls associated with sphalerite, marcasite, and carbonates. This indeed was a rather remarkable find, since large crystals of galena are rare in Maryland, and especially so in the gneiss.

In addition to these famous finds, there were collected early at Jones Falls certain varieties of zeolites that were found to be new sub-species. These are described further on.

The minerals occur in two associations, - in small crystals in pockets in the gneiss, and in veins of coarse pegmatite associated with the gneiss.

The minerals to be found are the following:

Molybdenite - This mineral is rare here. Of late years a 2 cm. lead gray cleavage plate was found at Gwynns Falls (Hilton Quarry), and more recently it has been found at Jones Falls as fine flakes, occurring on gneiss with galena, stilbite and calcite.

Galena - Also rather rare at the present time. In the fall of last year a specimen of galena was collected at Jones Falls. A few 2 mm. crystals were found with molybdenite as mentioned above. It is notable that only one such specimen was found even after diligent search. Galena seems to be a little less rare at Gwynns Falls as evidenced by Dr. Watson's find.

Sphalerite - This was found rather commonly at Jones Falls during 1935. It was found almost invariably along joint cavities, in dark red, malformed crystals, 2 to 4 mm. in size, and easily identified by the typical resinous luster.

Dear Mother  
I received your letter of the 10th and was  
glad to hear from you. I am well and  
hope these few lines will find you the same.  
I have not much news to write at present.  
The weather here is very warm now.  
I must close for this time. Write soon.  
Your affectionate son,  
John Smith

I have not much news to write at present.  
The weather here is very warm now.  
I must close for this time. Write soon.  
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The weather here is very warm now.  
I must close for this time. Write soon.  
Your affectionate son,  
John Smith

Chalcopyrite - This is found in minor quantities only, and always massive. Here it is interesting to note that by tarnishing on exposure, pyrite closely resembles chalcopyrite in the gneiss, but the latter mineral can be told by its test for copper in the laboratory. Chalcopyrite is usually found at Gwynns Falls.

Pyrite - This mineral occurs abundantly and usually in good crystals at both localities. At Jones Falls a crystal has been found exhibiting a purely octahedral form, and averaging 2 cm. in "diameter"; similar crystals have been recently found at Gwynns Falls (Hilton Quarry). At Gwynns Falls, large cubes and pyritohedrons have been found. The cube seems to be the most common form. One especially fine cube has been found, malformed, and measuring  $1\frac{1}{2}$  x  $1\frac{1}{2}$  x 2 cm. in size. It is very brilliant and singularly free from many striae. Larger and coarser cubes than this occur, but more often the pyrite is found in veins and masses.

Marcasite - Found usually at Gwynns Falls in cavities as a drusy encrustation with sphaerosiderite. It is a little lighter in color than pyrite, and can usually be told by the presence of its decomposition product melanterite.

Quartz - Quartz occurs in crystals and masses. Most commonly it is found in gray or smoky masses. The crystals are always on a massive quartz, and vary in size up to the largest but coarser prisms of about 5 cm. in length. At Gwynns Falls, short and stumpy doubly terminated crystals lying on a prism face on the rock have recently been found. Smaller but clear and stumpy crystals are sometimes found radiating from the cavity walls. The crystals occur most commonly at Gwynns Falls. Small masses of yellowish, translucent botryoidal chalcedony also occur in quartz cavities here (Hilton Quarry).

Hematite - This is found most frequently at Jones Falls as bright, brick-red earthy deposits in small cavities. It is found only in small amounts. Often the spots of hematite give an appearance of drops of blood on the stone.

Magnetite - Occurs generally in small octahedrons (1 to 3 mm.) and in iron black metallic masses and cleavages in the gneiss.

Ilmenite - Occurs in black platy cleavages, sometimes as large as 8 cm. long, and frequently with masses of small cubic pyrites, that are often drusy.

Limonite - Very often found with and encrusting other minerals. Often at Gwynns Falls one finds masses of milky quartz with numerous crystal cavities filled with limonite that has resulted from the oxidation of the pyrite crystals that were there. Also as brown earthy deposits with hematite along joint cavities.

Pyrolusite - Occurs generally in beautiful black delicate dendrites on rock surfaces. At Gwynns Falls, dendritic areas of a square foot or more have been observed.

Calcite - Occurs very sparingly. Powell (4) in 1893 described calcite crystals occurring in cavities at Jones Falls. The crystals were "transparent prisms of first and second orders in combination

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with the rhombohedron and basal plane." The sizes of the crystals varied from 2 to 4 mm. dia., and from 5 to 13 mm. in length. But the Calcite is usually found in small veins and cleavages in the gneiss. Iceland Spar has been reported to occur in small amounts.

Ankerite - Powell reports at Jones Falls ankerite in druses with the zeolites, and as semi-transparent rhombohedrons and saddle shaped globular forms as large as 1 inch in diameter.

Siderite - This mineral always occurs as the variety sphaerosiderite. "Lenticular carbonate of iron" is an appropriate name for it, for it very much resembles the lentil seed in shape and color. It occurs in cavities with sulphides and zeolites. However it weathers rapidly, on exposure, to limonite. Jones Falls is noted for the best specimens.

Barite - In tabular, or acicular white to colorless crystals occurring with carbonates and zeolites. The prisms vary in size up to about 3 mm. wide and 3 cm. in length. Most commonly found at Jones Falls. At this locality also there was found a gray cleavage piece of fetid barite several cms. on an edge. It is a peculiar fact that only this one specimen was found.

Gypsum - Recently a white powdery mineral in crusts was collected from an exposed joint surface at Jones Falls. Analyzed it proved to be impure gypsum. These crusts are soon washed away by the rain, however, so that they are only observed in dry weather.

Melanterite - This natural "green vitrol" occurs as a decomposition product of marcasite. The white powder is soluble in water; hence it is seldom seen.

Apatite - Occurs in small thin prisms 1 to 2 cms. in length. At Jones Falls sea-green crystals have been found, and at Gwynns Falls, brown ones.

Titanite - Reported in large crystals by the Maryland Geological Survey. Only a small, brown, vitreous mass has been observed by the writer at Jones Falls. A one inch crystal of Titanite was collected in 1864 at Jones Falls by Mr. Horace A. Brooks, and later found a place in the Chatard (5) collection. The crystal was described to be of the "lederite" type. Smaller envelope-shaped crystals are also described.

Samarskite - Referred to by Williams as being in the Chatard collection, and reputed to have been found at Jones Falls by Mr. Brooks in the latter part of the 19th century. No specimens have been reported found since then. Described as having "a black coaly luster, and a conchoidal fracture", very splintery, brittle, and massive. Dr. Chatard had an analysis made of the specimen.

Microcline - In large flesh red to brown cleavages, sometimes green. Occurs abundantly in the pegmatite associated with the gneiss. Myrmekite, a micro growth of quartz and plagioclase, developed on the border of the microcline is a characteristic constituent of the gneiss.

Orthoclase - Occurs in short, stout, white opaque prisms, sometimes as large as 6 mm. The crystals exhibit the forms (001),

The first part of the document discusses the general principles of the proposed system, which is designed to improve efficiency and reduce costs. It outlines the key objectives and the scope of the project.

The second part of the document provides a detailed description of the system's components and their interrelationships. It includes a flowchart illustrating the data flow and the operational process.

The third part of the document presents the results of the initial testing and evaluation. It compares the performance of the proposed system against existing methods, highlighting the significant improvements in speed and accuracy.

The fourth part of the document discusses the implementation plan and the resources required for the project. It identifies the key milestones and the roles of the various stakeholders involved in the process.

The fifth part of the document addresses the potential risks and challenges associated with the project. It proposes strategies to mitigate these risks and ensure the successful completion of the project.

The sixth part of the document provides a summary of the findings and conclusions. It reiterates the benefits of the proposed system and the importance of timely implementation.

The seventh part of the document contains the references and sources used in the preparation of the report. It lists the relevant literature and technical documents that informed the project.

The eighth part of the document includes the appendices, which provide additional information and data related to the project. These include detailed technical specifications and supporting documents.

The ninth part of the document contains the index and table of contents, which facilitate the navigation of the document. It lists the page numbers for each section and subsection.

The tenth part of the document is the concluding remarks, which express the author's appreciation for the support and assistance provided throughout the project. It also offers suggestions for future research and development.

The final part of the document is the signature and date, which certify the authenticity and validity of the report. It includes the name of the author and the date of completion.

(010), (110), and (101). The better specimens were collected at Gwynns Falls, but Jones Falls is referred to by Powell.

Oligoclase - This feldspar proves to be a sodic oligoclase. It occurs as grayish white cleavages in the pegmatite, and is told by the fine striae on the cleavage surface. A specimen that exhibits a play of colors was collected from the Hilton Quarry a few years ago.

Albite - The variety cleavelandite is reported by Watson to occur at Jones Falls in small quantities.

Axinite - Reported in 1814 by Gilmer (6) as occurring with chlorite, epidote, and feldspar at Jones Falls, but no further finds have been reported since.

Muscovite - Found at the present time most frequently at Gwynns Falls in large cleavages, often smoky. Small sharp hexagonal plates of muscovite occur in the gneiss at Jones Falls.

Biotite - Occurs best at Gwynns Falls in large black plates, sometimes as broad as 7 cm. A specimen of biotite running through muscovite is exhibited in the mineral collection of the Maryland House in Druid Hill Park.

Lepidomelane - In jet black scaly masses. A variety of black mica from Jones Falls is in the collection of the Johns Hopkins University identified as haughtonite. It was analyzed by Clarke (7) through Dr. Williams in 1886.

Chlorite - Found very commonly. At Jones Falls a very dark chlorite occurs in scaly lamellae differing from the lepidomelane only in its dull appearance. Powell reports the variety helminth occurring at Jones Falls with calcite and a dark brown mica. It is described as light green hexagonal plates, in rosettes, fan shapes, and vermicular forms of great variety. At Gwynns Falls, prochlorite has been found in light green, compact scaly masses.

Garnet - Occurs commonly in an almandite-spessartite variety. The trapezohedrons (211) are sometimes very small and perfect, but less fine specimens occur in sizes up to 3 cm. dia. The best crystals are usually to be found at Gwynns Falls.

Anthophyllite - In lamellar, dark green masses, best found at Gwynns Falls. Specimens break with a choppy surface, and show a splintery cleavage.

Tremolite - An asbestiform variety of tremolite was found at Gwynns Falls occurring in layers of smoky quartz as white, silky fibers; it is rather rare.

Hisingerite - This rare mineral was found in almost microscopic quantities on a specimen from Jones Falls, occurring with feldspar and epidote. The specimen was sent to the United States Geological Survey, Washington, D. C. for confirmation. Its composition was found to approximate that of hisingerite. No specimens have been found since the discovery in 1934.



Hornblende - Found usually in small thin black prisms, sometimes as long as 2 cms. in length. Good crystals are not common.

Chabazite - As the variety haydenite. This mineral variety was first noticed at Jones Falls in the early part of the 19th century by Dr. H. H. Haydon of Baltimore in whose honor it was named. The Jones Falls area early became world famous for this and other zeolitic varieties described below. In former years zeolite specimens were fine and many, but today due to the lesser amount of quarrying, and other factors, they are becoming scarce. Haydenite occurs in "cube-like" rhombohedrons, of a mahogany color, and ranging up to about 1 cm. on an edge. Occurring in cavities with other zeolites, it often is found with a brown earthy mineral (see below).

Stilbite - In dark orange radiating disks and globular masses, occurring with other zeolites. The best specimens are found at Jones Falls. Sometimes the disks are arranged over the rock surfaces so as to suggest the name "wheelstone" of the quarrymen.

Laumontite - In white prisms which rapidly crumble on exposure to the weather. Sometimes, at Jones Falls, it occurs as short stout prisms, about 1 cm. long which, when distributed over the rock surfaces, resemble "crab meat". Laumontite never occurs here with other zeolites.

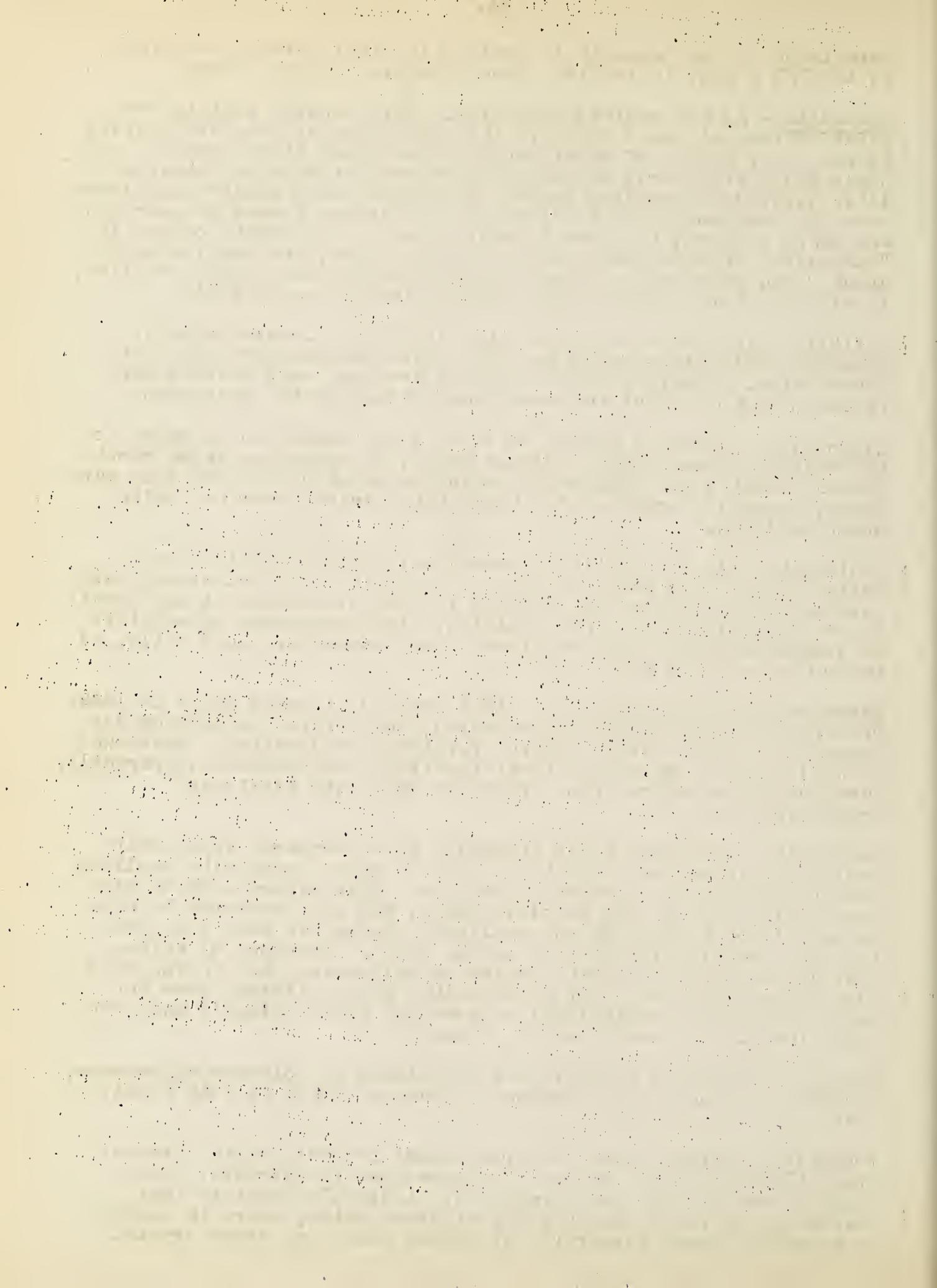
Heulandite - As the variety beaumontite. First described as a variety from Jones Falls in 1839. Occurs in small colorless, pale yellow, to green crystals, ranging in size up to about 1 mm; usually as drusy crusts on other zeolites. Its occurrence shows it to be younger than the other zeolites. Most common at Jones Falls, as the other zeolites are.

Harmotome (or Phillipsite?) - First noticed at Jones Falls in 1882. The crystals were white, cross-shaped, and altered quickly on exposure to a green earthy mineral (probably halloysite). Mentioned by Williams, who questions their identity. No specimens, apparently, have been found since then. They occurred with barite and sphaerosiderite.

Halloysite - Williams calls attention to a "compact, apparently amorphous mineral of a light blue color" which occurs with zeolites, and turns brown on exposure to the air. This mineral, which also occurs light steel gray to olive green, has been observed to be a decomposition product of the zeolites. There has been some controversy over its identity in recent years. Shannon (8) states that its analysis does not conform to halloysite, but to one of the high water clay group. It is deposited in a colloidal form but turns completely crystalline; it does not become plastic when wet. Hence the mineral awaits a better name.

Epidote - Occurs in pistacio colored bladed to columnar aggregates, and also in fine granular masses. Found commonly at both localities.

Tourmaline - Black prisms occurring most commonly at the present time at Gwynns Falls, where it is enveloped in chlorite. Some crystals are perfect and terminated. A singular fact is that tourmaline is rarely found today at Jones Falls, where it seemed to be quite common formerly. At Gwynns Falls one large crystal



was found measuring 5x5x15 cm.

Beryl - Reported by Tyson to occur in the gneiss in large crystals. Beryl has not been found by later investigators.

Kaolinite - This mineral, a feldspathic decomposition product, has been found in pure, white, compact masses of several inches diameter at Jones Falls. It usually collects in joint cavities.

Allanite - Reported as a microscopic inclusion in the iron micas.

Zircon - Occurs as rounded rough grains in the gneiss. It can usually be detected in the decomposition debris of the gneiss.

Staurolite, Sillimanite, and Cyanite - have been reported as microscopic constituents.

It is indeed with affection that the Baltimore mineralogists regard these old quarries. It is fascinating to read the old reports of these localities, when new mineral varieties were being found. Baltimore became very early well known as a famous mineral locality due to the specimens turned up at Jones Falls. In Cleveland's "Mineralogy" (1822) and in Robinson's "Catalogue of American Minerals" (1825) are long lists of minerals occurring here. These lists have passed over into those of later authorities.

It is with regret that the mineralogist views the future of these localities with the inevitable closing down of all operations, thereby denying access to new material from these quarries. However, some of these old mineral treasures have found a place in the Lee (9) collection, housed at Westminster College, Westminster, Maryland, and the Chatard collection housed at the Maryland Academy of Sciences, Baltimore. Dr. Williams' collection is at the Johns Hopkins University. Also these localities are well represented in the collections of the American Museum of Natural History, New York, and the National Museum, Washington, D. C.

The Natural History Society of Maryland has been very fortunate in adding to its collection some fine specimens collected in the past few years from these localities.

#### BIBLIOGRAPHY AND NOTES

- (1) P. T. Tyson - "A Descriptive Catalogue of the Principal Minerals from the State of Maryland". Trans. of the Maryland Academy of Science and Literature - Vol. I - 1837.
- (2) Geo. H. Williams - "Notes on the Minerals Occurring in the Neighborhood of Baltimore". Johns Hopkins University publication 1887.
- (3) E. H. Watson - "The Pegmatites of Maryland with Associated Phenomena", Johns Hopkins University dissertation, 1929.
- (4) S. L. Powell - "Notes of Minerals Recently Obtained from the Quarries of Jones Falls". Johns Hopkins University circular Vol. XII, 1893.
- (5) Dr. F. E. Chatard of the Maryland Academy of Science.
- (6) Robert Gilmer - "A Descriptive Catalogue of the Minerals occurring in the Vicinity of Baltimore, arranged according to the Methodique of Huay", 1814. Lived 1774-1848 and was president of the Maryland Academy of Science and Literature.



- (7) Prof. F. W. Clarke, United States Geological Survey, Washington, D. C.
- (8) Earl V. Shannon - "The So-called Halloysite of Jones Falls", American Mineralogist, Vol. 10, 1925.
- (9) Mr. John W. Lee of Baltimore.
- In addition to the above references, the following volumes of the Maryland Geological Survey have been consulted:-  
Vol. II, 1898; Vol. VI, 1908, and Report on Baltimore County.

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### NOTES

#### Meetings and Lectures at the Society

March 3 - Talk by Mr. Elmo Masters, "Insects and Their Anatomical Structure."

March 5 - Visit of students of Eastern High School accompanied by Miss Leonaie Meid. Address by Mr. Elra M. Palmer, "The Functions of the Natural History Society of Maryland."

March 7 - Junior Meeting - Talk by Mr. Elmo Masters, "Insects." Illustrated.

March 10 - Talk by Mr. Harry C. Robertson, "Snake Myths." Illustrated.

March 21 - Junior Meeting. Lecture by Mr. Herbert C. Moore, "Volcanoes of the World."

March 24 - Seventh Annual Meeting of the Society. Address on the progress by the President. Reports by the Secretary, Treasurer, Curators of Mineralogy, Paleontology, Botany, Entomology, Marine Life, Herpetology, Ornithology, Archaeology, the Editor of the Department of Publication, the Librarian, and the Director of Education.

March 28 - Junior Division. Field trip to Cross Country Boulevard. Insect larvae and batrachians collected.

March 31 - Talk by Mr. Elra M. Palmer, "The Rivers of Maryland."



Lectures to Outside Organizations

March 13 - To Troop 109, Boy Scouts of America, First M.E. Church, 22nd and St. Paul Sts., by Mr. L. Bryant Mather, Jr., "Rocks and Minerals." Illustrated.

March 16 - To Junior High School #1 by Mr. Elra M. Palmer, "Nature Study."

March 26 - To Baltimore City College, Boy Scouts of America Club and Biology students by Mr. Edmund B. Fladung, "Birds and Their Ways."

Exhibits

March 14 to 22 - Exhibit of Maryland Nature at the National Flower Show.

February 27 to March 31 - Three exhibits at the Gwynns Falls Park High School. Fossils, Minerals, and Insects.

February 1 to March 13 - Exhibit of Rocks and Minerals at Fairview School, Maryland.

Donations

From Dr. Edward B. Mathews, State Geologist, 32 bound volumes, consisting of Geological Annual Reports, County Reports and County Maps, Systematic Reports, New State Geological Map 1936, and the Hypsometric Map.

From Dr. Howard A. Kelly three volumes; "Guide to Common Mushrooms of New York," "Birds of North America," (Just published), "Bibliography of Dr. Howard A. Kelly's Mycological Library."

MEMORANDUM

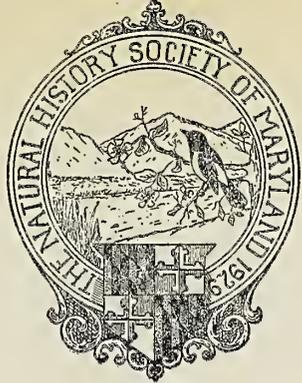
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*The Natural History*

*Society of Maryland*



# BULLETIN

Volume VI

APRIL, 1936

Number 8

## FISH OBSERVED AT COVE POINT, MARYLAND

By Frank Yingling

Members of the Department of Marine Research of this Society spent a very pleasant week in the summer of 1934 on the colorful Chesapeake at Cove Point, Calvert County, Maryland.

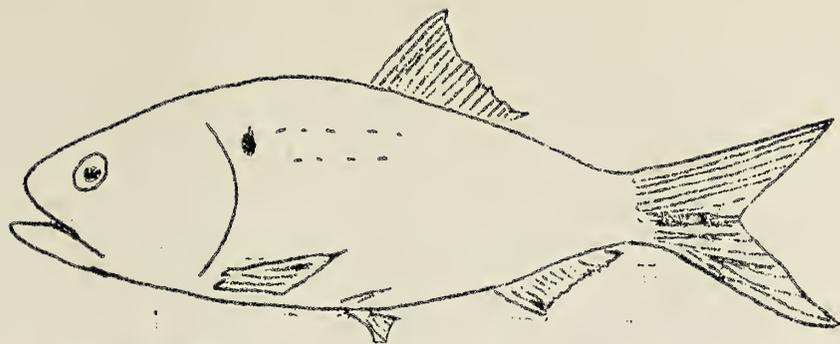
This article deals principally with the coastal fishes as we observed them. Two types of localities were worked, the marine waters of the Bay and the brackish waters of the tidepools.

The Bay at this locale was quite barren, being devoid of eel grass and other flora. The bottom was but a barren stretch of sand. At this point most of the collecting was done close to shore with a twenty foot collecting seine. Eighteen species were collected and some very interesting observations made.

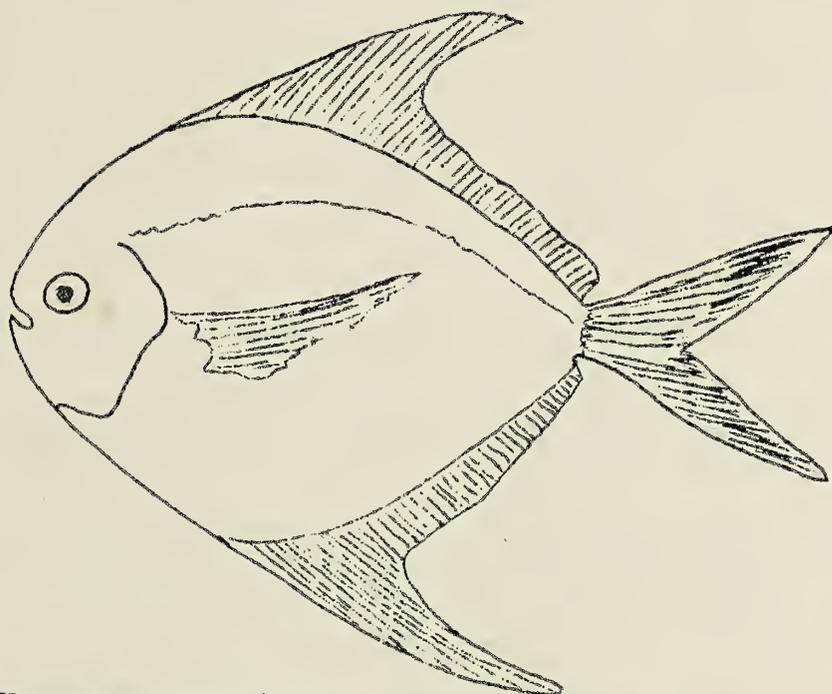
The most widely observed fish was the Menhaden (*Brevoortia tyrannus*). Due to their habit of swimming near the surface in huge schools, these fish could easily be seen from a distance. This schooling caused ripples in the water and reminded one of the wind blowing in one spot on a calm day. As the fish approached near the shore or to a stationary object, such as a boat or a light beacon they seldom broke water. They were mostly observed a few inches below the surface, the ripples ceasing as they descended lower in the water. Under the water their undulating and turning reminded one of a gleaming piece of metal in the sunlight, the gleam being caused by the brassy luster of their sides. If one were really observant he could notice the fish swimming, their mouths open, by this means feeding on the microscopic forms, straining them from the water which passed into the mouth and through the gills. These fish are so abundant they are used for fertilizer and fish oil. They are quite useless for food.

Some very common coastal fish, which collected in schools near the shore were the Silversides (*Menidia menidia*). They are gregarious in habit and were largely observed traveling in schools of a few dozen to several hundred fish. The smaller schools of these fish were several times seen close to shore swimming in a V-shaped

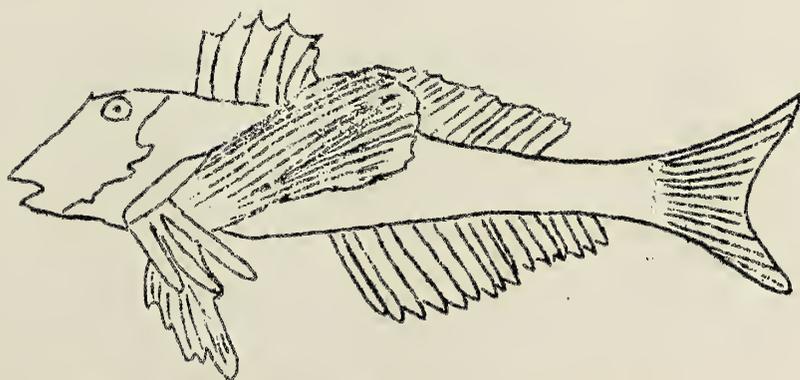




Menhaden (*Brevoortia tyrannus*) X 1/3



Harvest fish (*Peprilus alepidotus*) X 1/2



Gurnard (*Prionotus carolinus*) X 1/3



formation and usually followed by a Houndfish. When the fish were attacked the school broke and reformed in the opposite direction. Due to the small size of the Silversides they are not utilized for food by man but are prey for our predacious fish.

A rather wicked looking fish that swam close to the surface was the Houndfish (*Tylosurus marinus*). Very often we saw this fish following schools of Silversides in the same manner as a hound would pursue a fox. Several Silversides that were injured during seining were thrown into open water and were readily seized by the Houndfish. The manner in which these fish seized the prey was quite odd; the victim was taken crosswise in the jaws, then twirled, possibly to stun it. The Houndfish then swam with its prey to deeper water where it was most likely devoured.

A fish of considerable food value is the Croaker (*Micropogon undulatus*). The Croaker was found to be quite common in the afternoon off shore on the flood tide. Several of them were dissected and were found to be females with undeveloped eggs in the ovaries. Fish taken during the flood tide were found upon dissection to be feeding on bivalves, the intestine being gorged with the valves of the same. A few had fed on the Silverside. The Croakers when taken from the water emitted a peculiar grunt; hence the name "Cræker". It was quite capable of emitting this sound either under the water or when removed. This croaking is caused by the croaking muscles and the air bladder.

Closely observing large Jellyfish floating on the ebbtide we noticed something rather odd under the hood of the Jellyfish. By quickly placing a dip net thereunder we found the Harvest Fish (*Peprilis alepidotus*). At this locality this species was only seen and collected from under the hood of the Jellyfish.

A scene which was peculiar but interesting was noted when one of these fish was thrown into open water. The fish returned swiftly to the shore and was caught freely with the hand.

It appeared as though the Harvestfish had a great fear of the open water when not in schools. Also it was quite lost without its host the Jelly. Others of this species that were released quickly sought a Jelly and swam beneath the hood; then floated leisurely under their host.

Along a sandy stretch of shallow water we came across a rather grotesque looking fish which is called the Sea Robin or Gurnard (*Prionotus carolinus*). The Gurnard is known as the walking and swimming fish of the Bay because of its peculiar habit of spreading its pectoral appendages. It settled upon the bottom and by a hopping motion looked as though it was strutting. When it was taken from the water, it immediately spread its fin and produced a strange sound. As the Gurnard was dropped back into the water it swam for a short distance, settled upon the bottom again, and began strutting in a hopping-like motion.

We found close to the shore in the shallows the Anchovy, (*Anchoviella apsetus*). This fish was seen in association with the Silverside but was not quite as abundant. It was more easily recognized from the others by the wide mouth and upper jaw which

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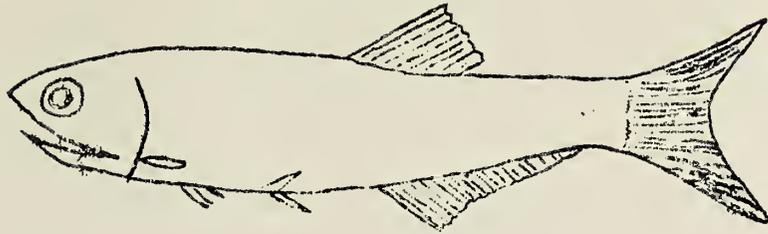
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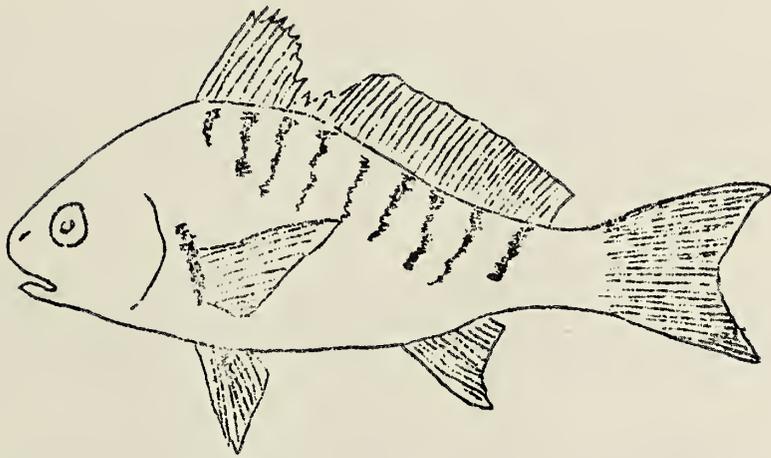
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Anchovy (*Anchoviella epsetus*) Nat. size



Spot (*Leiostomus xanthurus*) X 1/4



overhung the lower.

Several times while viewing schools of Menhaden we noticed that the school would jump and break. We watched closely and found the reason was that the bloody pirates of the bay, the Bluefish (*Pomatomus saltatrix*) were at work attacking the schools like a pack of hungry wolves following a herd of sheep. The Bluefish seem to kill for the mere love of killing, as numerous fish were found dead or injured. These fish were not eaten; merely a chunk of flesh was torn out. In some instances an opercle had been ripped off and on others the tail was severed from the body. One glance at the saw toothed mouth of the Bluefish will suffice to indicate the damage it is capable of doing.

Because of the high winds and rough waters which caused the tide to rise several feet, large quantities of eel grass were found washed close to shore. Upon close examination we found the young of several species of fish securely hidden among the strands. The most common was the Pipefish (*Syngnathus fuscus*). These Pipefish were taken in several color patterns, the most dominant color being a pale brown with the sides patterned in bars.

Among other fish collected at this locality were the Bay Trout (*Cynoscion nebulosus*), the Sand Perch (*Bairdiella chrysura*), the Sea Mink (*Menticurhus americanus*), and the Spot (*Leiostomus xanthurus*).

Collected but not common at this locale were the Common Eel (*Anquilla rostrata*) and the Swellfish (*Tetraodon maculatus*), which is quite an oddity, because of its ability to inflate itself with either air or water. The Toad Fish (*Opsanus tau*) also noted, is the most widely despised fish of the bay because of its appearance and its formidable mouth.

Off the rocks we seined a small peculiar fish, the Cling Fish (*Gobiesox strumosus*), a fish that is capable of clinging to objects. This it is able to do because it has a sucking disk on the ventral part of the body between the pelvic fins.

Along the beach we came across several tidepools. The most prominent fish here were the Killifish of the family Cyprinodontidae, a family of small fish having no direct food value but being quite valuable as food for our larger fishes. The most abundant was the Mummichog (*Fundulus heteroclitus*) found in a variety of colors. The Pursy Minnow (*Cyprinodon variegatus*) which is considered the most gaudy of this family, the body being highly iridescent, was also seen. These fish swam very close to shore in small schools and were in a spawning condition. The males were very bellicose. They were often observed engaged in battle for the favor of a mate. The males' colors became almost brilliant. The back and head assumed a steel blue hue, fading further back to a greenish luster; the ventral part of the body seemed to brighten to a deep salmon pink. The dorsal fins had an orange tinted margin in front while the ventral and anal fins changed to a dusky color margined with orange. After the mate was accepted or selected, the male would swim about the female forcing her toward shallow water. In fact so far up did they go it seemed that on the receding tide, the spawn



would be left out of the water. When the fish were side by side the spawn was most likely ejected, the female swimming off after a momentary pause. The male hovered a bit about the eggs, then swam away and selected another mate. According to our observations the male spawned with several females.

We also found, where vegetation was thick, the Rainwater Fish (*Lucania parva*) and the Top Minnow (*Gambusia holbrooki*).

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## NOTES

### Meetings and Lectures at the Society

April 4 - Junior meeting. Talk by Mr. Clyde Reed, "Thallophytes and Protozoa." Illustrated.

April 4 - The Annual Meeting of the Board of Trustees. Election of officers. President, Edmund B. Fladung, Vice President, Gilbert C. Klingel, Secretary, John B. Calder, Treasurer, A. Llewellyn Jones. Following committees were appointed - Executive, Gilbert C. Klingel, chairman, John B. Calder, A. Llewellyn Jones, and President Ex. officio. Finance, A. Llewellyn Jones, chairman, Gilbert C. Klingel, Elra M. Palmer, President Ex. officio. Membership, John B. Calder, chairman, Edward McColgan, Herbert J. Moore, President Ex. officio. Museum, Edmund B. Fladung, chairman, Gilbert C. Klingel, Elra M. Palmer, and Frederick Saffran.

April 7 - General assembly. Talk by Mr. Walter E. Price, Jr., "Structure of the Earth."

April 14 - General assembly. Talk by Mr. Andrew A. Goss, "How Our Maryland Indians Lived."

April 18 - Junior meeting. Two lectures. Arthur Moore, "Minerals of Woodbury Quarry." Ned Crosby, "Radium." Followed by discussion on radium and radio-activity.

April 21 - Lecture at Enoch Pratt Library, Central Branch, by Dr. Harry C. Oberholser of U. S. Biological Survey, "A Bird Lover about Baltimore."

April 25 - Junior meeting. Hike - Bare Hills and Copper Mines. Collected new specimens and lichens.

### Lectures to Outside Organizations

April 3 - At Biological Club Baltimore City College, "Turtles We Should Know", by Elias Cohen.

April 7 - Maryland Fish Culturist "Exploring the Bottom of the Chesapeake." Mr. Gilbert C. Klingel.

April 11 - Three separate lectures - Y.M.C.A. Central Branch.

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"Truth about Snakes" by Mr. H. Charles Robertson.

April 15 - At Baltimore City College Evening High School, two lectures, "Snakes of Maryland", by Mr. Elra M. Palmer.

April 15 - At Enoch Pratt Library, Branch 12, "Birds about Maryland", by Mr. Irving E. Hampe.

April 16 - At Baltimore City College Evening High School, three lectures, "Snakes of Maryland", by Mr. Elra M. Palmer.

April 16 - Assembly at Edgar Allen Poe Junior High School. "Snakes of Maryland", by Mr. Elra M. Palmer.

April 17 - Assembly, Roland Park Junior High School, "Snakes of Maryland", by Mr. Elra M. Palmer.

April 21 - Enoch Pratt Library, Branch 13. "Reptiles We Should Know", by Elias Cohen.

April 23 - At Baltimore City College Evening High School, Science Class, "Beauties of the Insect World" by Mr. Elra M. Palmer.

April 23 - At Baltimore City College Evening High School Science Class, "Representatives of Insect Orders", by Mr. Elra M. Palmer.

April 23 - At Baltimore City College Evening High School, "Collecting and Preserving Insects", by Mr. Elra M. Palmer.

April 23 - School Service - Demonstration cases of Insects loaned to Biology classes, Baltimore City College.

April 29 - Talk at Gilman Country School, "Birds and Their Ways", by Mr. Edmund B. Fladung.

#### Special School Service

April 13 - Junior High School No. 1 - Loan of Marine specimens for 4 days.

April 15 - Enoch Pratt Library, Branch #12. Judging of Bird contest by Mr. Fladung and Mr. Klingel.

#### Exhibitions

April 20 - At South Potomac Junior High School Hagerstown Conservation Exhibit. Exhibit of Bird and Plant photographs.

April 30 - At Enoch Pratt Library, Branch #12. Month exhibit of Butterflies and Moths.

Gift Collections - April 8 - Gift of 27 minerals to Department of Chemistry, University of Maryland.

Contributions - From Dr. Cerman - Collection of birds' eggs. From T. B. Gatch Building & Construction Company mineral specimen.

General Report on the State of the Republic

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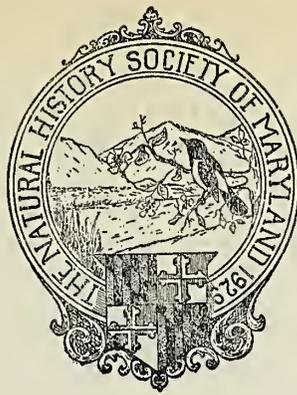
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**BULLETIN**



Volume VI

MAY, 1936

Number 8

THE BEECH RAVINE  
(An Ecological Study)  
By John B. Egerton

Of the numerous vales that open into the lower Patapsco Valley, there is one known to us as the Beech Ravine. For years it has been a favorite retreat in inclement weather and a place where the earliest flowers bloomed. It is a narrow, eroded valley, in its broadest part not more than one hundred yards wide, through which a stream known as Soapstone Branch wends its way, by gradual descents, in a southwesterly direction for about a mile between hills that rise rather steeply on both sides to a height, in its deepest part, of approximately two hundred feet. It is thus shut in and protected from the cold northwest winds but lies open to the setting sun for a longer day.

The soil is a rich loam overlying a solid formation of granitic rock. The slopes and bed are well wooded and a never failing stream flows down it to join a larger one known as Bull Run which empties into the Patapsco. Here the first blossoms of spring are almost always to be found in profusion in advance of other places thereabouts. To this ravine a little group of botanists betook themselves the first Saturday of April.

The winter with us, as all know, was extremely cold. Seldom does the thermometer around Baltimore get down to zero; but last winter it went far below. In addition to the extreme cold, it lasted nearly to the end of March. Vegetation was thereby held back and the first signs of awakening spring delayed so that, instead of the usual succession of blossoming, the flowers of the earlier blooming species seemed to appear simultaneously on the first warm days of spring.

The few warm days this year towards the end of March were all that were needed to awaken dormant plant life and start things agoing. So the first Saturday of April was just the day to visit the Beech Ravine and to be sure it found us there. Already we had seen from the trolley windows and in many places along the road the Silver Maple (*Acer saccharinum*) offering an early feast to the bees. And after alighting, we saw in abundance in old fields and garden spots, Chickweed (*Stellaria* or *Alsine media*) lifting its small cleft petals to the sun's warm rays. In dryer and poorer soil flowering

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shoots of the Lyreleaf Rockcress (*Arabis lyrata*) were rising above the little rosettes of winter leaves and beginning to bloom.

As we entered the wood leading to the ravine, a maze of gold greeted us everywhere; for the twigs and larger branches of Spice-wood (*Benzoin aestivale*) were densely covered with their exquisite little yellow flowers, so small that a magnifying glass is needed to enjoy their individual beauty and see the curious little trap-doors to the anthers that guard their pollen; while on the ground beneath, in fuzzy grass-like clumps, the Wood-Rush (*Luzula* or *Juncoides campestre*) reared in profusion, though inconspicuously, its tawny, lily-like flowers.

A little further on in the woods the bright green, trilobed leaves of Liver Leaf (*Hepatica triloba*) would have stood out in sharp contrast to the brown leaves of Oak, Tulip-tree, Beech and Red Maple, had not their own bright purple, blue, pink and white flowers been so much more conspicuous. Here too, a grass was in flower, possibly *Poa annua*, but I am not sure; while in damper places a sedge resembling *Carex pennsylvanica* was in evidence.

Rising above these ground-loving plants in little thickets, here and there, were patches of Hazel (*Corylus americana*) with long, drooping catkins of staminate flowers along the sides of their upper branches and exquisite little pistillate flowers with bright red stigmas at their tips. And in a layer above these, Slippery Elm (*Ulmus fulva*) had burst its buds and the flowers were well on to setting seed.

As the ravine was descended, the hill sides began to glow with the white petals and golden stamens of Bloodroot (*Sanguinaria canadensis*) as its large deeply lobed leaves expanded and its creamy flowers exposed; while here and there the white flowers of Rue Anemone (*Anemonella* or *Syndesmon thalictroides*), some slightly tinged with pink, added to the display.

A little further down the valley its rocky foundation began to crop out and irregular masses of stone made walking less easy. Here that peculiar supple plant we call Leatherwood (*Dirca palustris*) made its appearance in full bloom; though its fairly large flowers, of a brownish-yellow, scarcely differing from the bark in color, are not at all conspicuous. Here too was the Papaw (*Asimina triloba*) its dark purple buds large enough to attract attention and reveal its identity to even a casual observer.

By this time the lowest part of the ravine had been reached. Here Red Maple (*Acer rubrum*), Rough Alder (*Alnus rugosa*), and Slippery Elm (*Ulmus fulva*) were abundant and all in bloom, or very near it; though their flowers, exquisite as they are to the botanist, are apt to be over-looked by others. Here too on rocky ledges, in addition to *Hepatica* and *Bloodroot*, our little *Saxifrage* (*Saxifraga virginensis*) was holding its own; while in more level and wetter places, Spring Beauty (*Claytonia virginica*) and the Dogtooth Violet (*Erythronium americanum*) covered the ground with pink and gold and bronze spotted leaves, making a picture that would charm any lover of the beautiful.

Less conspicuous, but no less beautiful, still in their winter attire were such shrubs as Witch Hazel, so attractive in late fall,

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Ironwood, several species of Dogwood, and Viburnum, Wild Hydrangea, the Bush Honeysuckles (Azalea) and American Laurel (Kalmia), to say nothing of evergreen Ferns, Mosses, Liverworts and Lichens; enough to keep a botanist busy for weeks. While overhead towered the sturdy Oak, the graceful Elm and the beautiful Beeches from which the ravine received its name.

Here, in the deepest part of the Beech Ravine, at an accustomed spot, we built our fire on a pile of ashes, the remains of many a cord of wood burned on previous occasions. Here we listed our finds and talked of old times and times yet to be; watched the sun sink over the hills into the western sky as the flames consumed the last log and quivering gently died away. And when each lingering ember had ceased to glow and all was safe from smoldering sparks, we gathered up our belongings and sauntered off through the darkening woods towards home, a little tired perhaps, but immensely better for the afternoon spent in Nature's company.

--\*-

### ANOTHER SIDE OF NATURE

By Irving E. Hampe

On August 9, 1935, while observing the birdlife of the pine woods near Cove Point, Maryland, I saw what I at first thought was a small yellow bird fluttering about in the path several hundred feet ahead of me. Close inspection showed a large yellow moth frantically trying to dislodge a wasp which had fastened itself to the moth's head. The moth fluttered to the ground and was immediately pounced upon by a half dozen wasps that had been hovering about. Taking a seat on the ground as close as possible to the combat, I followed the struggles of the moth with interest, and recorded the contest in my notebook.

- A.M.
- 11:05 .Observed the moth fluttering about, a foot or so above ground, with one wasp attached to its head.
- 11:07 The moth fell to the ground and was attacked by six more wasps. These fastened themselves to the moth's abdomen.
- 11:08 Moth fluttered about within a radius of one foot of where  
to it fell to the ground. Occasionally a wasp would be  
11:15 thrown off but it would immediately return to the fray.
- 11:15 The moth's movements became feeble as the wasps tore  
to pieces of its abdomen loose and carried them away.
- 11:25 Several times the moth turned over on its back in  
spasmodic efforts to dislodge the wasps.
- 11:25 During this time, except for an occasional flutter of its  
to wings, the moth had not moved. The wasps that had flown  
11:45 away with particles of the moth's anatomy returned,  
accompanied by other wasps.
- 11:45 The moth showed no sign of life beyond a slight fluttering  
to of its wings. Wasps swarmed all over its body.
- 11:50

THE UNIVERSITY OF CHICAGO  
DEPARTMENT OF CHEMISTRY  
530 SOUTH EAST ASIAN AVENUE  
CHICAGO, ILLINOIS 60607  
TEL: 773-936-3700

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RESEARCH REPORT

NO. 1234

The following report describes the results of a study conducted by the author in the laboratory of the Department of Chemistry, University of Chicago, during the period from January 1, 1963, to December 31, 1963. The study was supported by the National Science Foundation, Grant No. [illegible].

The purpose of this study was to determine the effect of [illegible] on the rate of [illegible] reaction. The results are presented in the following tables and figures.

The first series of experiments was conducted at a temperature of 25°C. The results are shown in Table I. It can be seen from this table that the rate of reaction increases with increasing concentration of [illegible].

The second series of experiments was conducted at a temperature of 35°C. The results are shown in Table II. It can be seen from this table that the rate of reaction increases with increasing concentration of [illegible].

The third series of experiments was conducted at a temperature of 45°C. The results are shown in Table III. It can be seen from this table that the rate of reaction increases with increasing concentration of [illegible].

The fourth series of experiments was conducted at a temperature of 55°C. The results are shown in Table IV. It can be seen from this table that the rate of reaction increases with increasing concentration of [illegible].

The fifth series of experiments was conducted at a temperature of 65°C. The results are shown in Table V. It can be seen from this table that the rate of reaction increases with increasing concentration of [illegible].

11:55 The moth showing no signs of life, was collected for identification with several of the wasps.

The specimens were identified by Mr. Elmo Masters, of the Department of Entomology, as follows:

MOTH : *Basilonia imperialis* Drury.  
WASP : *Vespula vespula germanica* Fabricius.

-\*-

THE GREEN TREE FROG  
(*Hyla cinerea*)

By Louis A. Putens

As we force our way through the reeds and swamp grasses of any southern Maryland marsh we will see many green tree frogs (*H. cinerea*) clinging to the tall blades. They could well be called the reed frog, for it is on them and in the water from which the reeds grow, that they make their home.

In the upper parts of the body they vary in color from light green to dark olive. On the back there are a few minute golden flecks. The under surface is white and rather granular. Running from the snout to the end of the body and extending the whole length of the leg is a prominent silvery white line. This white side-stripe gives these little creatures a very neat and attractive appearance.

The general structure of the body is slender and flat with a pointed head and shallow face.

In size *H. cinerea* varies from  $1\frac{1}{2}$  to 3 inches in length. For its size it is the longest legged *Hyla* of the east.

This frog breeds from April to August. The eggs are in small masses at or near the surface of the water, attached to floating vegetation. The tadpole is about  $1\text{-}3\frac{3}{5}$  inches long, its body green with a white stripe from snout to eye. The larval period is from fifty to sixty days. When the young frogs transform they are from  $1\frac{1}{2}$  to  $11\frac{1}{16}$  inches long.

The range of *H. cinerea* is from Maryland to Texas. The marshes near Cove Point, Maryland are a typical locality in which to find this interesting *Hyla*. As the observer moves through the very thick growth he will get fleeting glimpses of these bright green fellows as they make frantic leaps to elude him. If his movements are slow and cautious they can sometimes be seen clinging to the reed blades with their bodies pressed tightly against the surface.

Their favorite location is about midway between the bottom and the tip of the blade. When pursued they are very reluctant to take to the water. This is contrary to the habits of many other frogs, particularly those of the *Rana* group, which will invariably seek safety below the surface.

THE UNIVERSITY OF CHICAGO  
DEPARTMENT OF CHEMISTRY

REPORT OF THE COMMITTEE ON THE  
PROGRESS OF CHEMISTRY IN 1911

Presented to the Faculty of the University of Chicago  
at the meeting of the Department of Chemistry  
held on the 15th day of May, 1912

By the Committee on the Progress of Chemistry  
in 1911

W. H. C. ...  
Chairman

The progress of chemistry in the year 1911 has been marked by several important discoveries and advances in various fields. The work of the Department of Chemistry has been particularly noteworthy in the study of the properties of the elements and the synthesis of new compounds.

The discovery of the element Radium by Marie and Pierre Curie in 1898 was a landmark event in the history of chemistry. Their work on the radioactivity of this element has led to a better understanding of the structure of matter and the nature of energy. In 1911, further studies of Radium and other radioactive elements have been carried out, and the results have confirmed the earlier findings.

The study of the properties of the elements has also been a major branch of chemistry in 1911. The discovery of the element Francium by Marie Curie and her colleagues in 1911 was a significant achievement. The study of the properties of this element and other heavy elements has led to a better understanding of the periodic table and the nature of the elements.

The synthesis of new compounds has also been a major branch of chemistry in 1911. The discovery of the element Actinium by Marie Curie and her colleagues in 1911 was a significant achievement. The synthesis of new compounds from these elements has led to a better understanding of the properties of the elements and the nature of the compounds.

The study of the properties of the elements and the synthesis of new compounds have been the major branches of chemistry in 1911. The discovery of the element Radium and the element Francium have been particularly noteworthy. The study of the properties of these elements and the synthesis of new compounds from them has led to a better understanding of the periodic table and the nature of the elements.

The progress of chemistry in the year 1911 has been marked by several important discoveries and advances in various fields. The work of the Department of Chemistry has been particularly noteworthy in the study of the properties of the elements and the synthesis of new compounds. The discovery of the element Radium and the element Francium have been particularly noteworthy. The study of the properties of these elements and the synthesis of new compounds from them has led to a better understanding of the periodic table and the nature of the elements.

NOTESMeetings and Lectures at the Society

- May 5 - Illustrated lecture by Dr. R. Lee Collins, of Johns Hopkins University, "Whales Past and Present."
- May 12 - Talk by Mr. Francis O'Rourke, "Our Native Shrubs." Illustrated.
- May 19 - Talk by Mr. Edmund B. Fladung, "The Value of the Educational Policy and Program of the Society."
- May 26 - Talk by Mr. Charles Ostrander, "Opals, Their Beauty and Value."
- May 2 - Junior Meeting. Lecture by Mr. Elmo Masters, "The 17 Year Locust."
- May 9 - Junior Meeting. Lecture by Mr. Elra M. Palmer, "Through Southern Maryland."
- May 16 - Junior Meeting. Talks by Carl Ortel, "Hawks and Owls" Illustrated; by Elias Cohen, "Turtles."
- May 23 - Junior Division. Field Trip to Morrell Park. Minerals, plants and fossils were collected.

Lectures to Outside Organizations

- May 5 - To The Isaac Walton League by Mr. Gilbert C. Klingel, "Marine Research Work of the Natural History Society of Maryland." Illustrated.
- May 8 - To the Boy Scouts of America, St. Johns Church, by Mr. Elias Cohen, "Snakes We Should Know."
- May 8 - Three lectures to Boy Scout Troops, Nos. 23, 100, 156, by Mr. Francis O'Rourke, "Our Common Birds."
- May 14 - Lecture to Clifton Park Improvement Association by Mr. Gilbert C. Klingel, "Exploring Beneath the Waters of the Chesapeake."
- May 26 - To Boy Scout Troop No. 86 by Mr. Elmo Masters, "The 17 Year Locust."
- May 29 - Four lectures to Biological Class of Baltimore City College by Elias Cohen, "Maryland Turtles We Should Know."

Exhibition

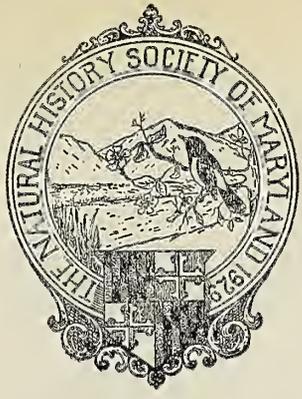
- May 1 - 21, Exhibitions of Birds in connection with the Federated Garden Clubs at Enoch Pratt Library.

Publication

- Republication of the "Familiar Moths of Maryland" a leaflet of twenty pages with half-tone cuts.
- A four page leaflet "The Periodic Cicada" written by Mr. Elmo Masters, Curator of Entomology.



1315



The Natural History

Society of Maryland



# BULLETIN

Volume VI

JUNE, 1936

Number 10

## BIRD NOTES FROM SOLOMON'S ISLAND AND COVE POINT, MARYLAND

By Irving E. Hampe

During the month of August, 1935, I was fortunate enough to spend a week, from the fourth to the eleventh, at the Chesapeake Biological Laboratory at Solomon's Island, Maryland. Although my work was not of an ornithological nature, I found time to make numerous observations of the birds about Solomon's Island and made several trips to Cove Point especially to observe the birdlife there.

The birdlife at Solomon's Island was observed mainly from the float of the Marine Research Department's diving apparatus, the Bentharium. The first two days were spent in the harbor where the birdlife was not abundant. On the third day the apparatus was towed to a location in the Patuxent River about a quarter of a mile off shore facing the laboratory. From this location observations increased and numerous notes were recorded.

The Cove Point area, where I spent several days, proved of exceptional interest. Many hours were spent plodding the hot, sandy beaches, wading through the swamps and tide pools, and traversing the adjacent woods and fields. The varied types of flora appealed to the various species of birds.

Following is the list of birds observed:-

- |                                  |  |
|----------------------------------|--|
| <u>Great Blue Heron</u>          | Ardea h. herodias A few were observed in the marshes at Cove Point. Not numerous at any one time.  |
| <u>Eastern Green Heron</u>       | Butorides v. viresceus At least one of this species was observed on every trip to Cove Point. Several seen in the creek at Solomon's Island. |
| <u>Black-crowned Night Heron</u> | Nycticorax nycticorax hoactli One bird observed in the marshes near Cove Point.  |
| <u>Wood Duck</u>                 | Aix sponsa Male and female flushed from a small stream at Cove Point.  |

FEB 24 1937



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THE STATE OF TEXAS, COUNTY OF DALLAS, this 1st day of January, 1901.

I, the undersigned, a Justice of the Peace in and for the County of Dallas, State of Texas, do hereby certify that the within and foregoing is a true and correct copy of the original as the same appears in the records of my office.

Witness my hand and the seal of my office at Dallas, Texas, this 1st day of January, 1901.

J. M. [Name], Justice of the Peace.

Attest: My hand and seal of my office at Dallas, Texas, this 1st day of January, 1901.

[Name], Notary Public.

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- Turkey Vulture *Cathartes aura septentrionalis* Very common at Solomon's Island. A few observed at Cove Point.
- Black Vulture *Coragyps a. atratus* Several birds of this species were seen every day at Solomon's Island mingling with the previous species.
- Cooper's Hawk *Accipiter cooperi* One bird observed near wood between Solomon's Island and Cove Point.
- Osprey *Pandion haliaetus carolinensis* Common species at both localities.
- Bob-White *Colinus v. virginianus* Seen and heard nearly every day spent at Cove Point.
- Killdeer *Oxyechus v. vociferus* Common along the beach at Cove Point.
- Spotted Sandpiper *Actitis macularia* Observed along the tide pools several times at Cove Point.
- Herring Gull *Larus argentatus smithsonianus* Four birds of this species were observed over the Patuxent River near Solomon's Island on August 7th.
- Laughing Gull *Larus atricilla* Very common about Solomon's Island. A large number of immature birds were observed.
- Forster's Tern *Sterna forsteri* Common about Solomon's Island. Could be found at any time during the day on poles in the water several hundred yards off shore from the laboratory.
- Common Tern *Sterna h. hirundo* Several birds of this species were observed over the Patuxent River above Solomon's Island.
- Least Tern *Sterna a. antillarum* A colony of these birds was observed at Cove Point. They breed there earlier in the summer.
- Mourning Dove *Zenaidura macroura carolinensis* Common in fields and open woodlands about Solomon's Island.
- Chimney Swift *Chaetura pelagica* A small flock observed every day at Solomon's Island.
- Ruby-throated Hummingbird *Archilochus colubris* Very common back of the beaches at Cove Point.

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<u>Belted Kingfisher</u>	<i>Megaceryle a. alcyon</i> Several observed on the Patuxent near Solomon's Island.
<u>Pileated Woodpecker</u>	<i>Ceophloeus p. pileatus</i> This species is uncommon in this locality. One bird observed in heavy woods beyond Cove Point.
<u>Downy Woodpecker</u>	<i>Dryobates pubesceus medianus</i> Common throughout woods in both areas.
<u>Kingbird</u>	<i>Tyrannus tyrannus</i> Observed everywhere I went during the week. Very common.
<u>Crested flycatcher</u>	<i>Myiarchus crinitus boreus</i> Found in small numbers near Cove Point and occasionally at Solomon's Island.
<u>Phoebe</u>	<i>Sayornis phoebe</i> Next to the Kingbird, this species was the most common of the flycatchers.
<u>Bank Swallow</u>	<i>Riparia r. riparia</i> Abundant at Solomon's and a few at Cove Point.
<u>Rough-winged Swallow</u>	<i>Stelgidopteryx ruficollis serripennis</i> A few of this species observed near Solomon's.
<u>Barn Swallow</u>	<i>Hirundo erythrogaster</i> Abundant on the Island. The telegraph wires were lined with them every evening.
<u>Purple Martin</u>	<i>Progne s. subis</i> Fairly common at both places.
<u>Eastern Crow</u>	<i>Corvus b. brachyrhynchus</i> Common at all times.
<u>Fish Crow</u>	<i>Corvus ossifragus</i> Several birds observed with the previous species at Cove Point.
<u>Carolina Chickadee</u>	<i>Penthestes carolinensisca rolinensis</i> Observed on several occasions in pine woods near Cove Point.
<u>Tufted Titmouse</u>	<i>Baeolophus bicolor</i> Observed a few in company with the preceding species.
<u>House Wren</u>	<i>Troglodytes a. aedon</i> Common everywhere.
<u>Long-billed Marsh Wren</u>	<i>Telmatodytes p. palustris</i> Several of this species observed in marshes beyond Cove Point.
<u>Mockingbird</u>	<i>Mimus p. pollyglottos</i> Common everywhere.
<u>Catbird</u>	<i>Dumetella carolinensis</i> Only a few birds of this species observed although they have been found in numbers at other seasons.

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<u>Robin</u>	<i>Turdus migratorius achrusterus</i> Abundant at both localities.
<u>Wood Thrush</u>	<i>Hylocichla mustelina</i> Numerous in all woods nearby, and sometimes observed in the town.
<u>Bluebird</u>	<i>Sialia s. sialis</i> Fairly common in open lots and fields. Observed quite often along the roads.
<u>Blue-gray gnatcatcher</u>	<i>Poliptila c. caerulea</i> Fairly common in shrubs back of the beach at Cove Point.
<u>Starling</u>	<i>Sturnus v. vulgaris</i> Abundant everywhere.
<u>Yellow Warbler</u>	<i>Dendroica a. aestiva</i> Observed one in shrubbery near the Cove Point lighthouse.
<u>Pine Warbler</u>	<i>Dendroica p. pinus</i> Common in woods near Cove Point.
<u>Prairie Warbler</u>	<i>Dendroica d. discolor</i> Found in the low shrubbery back of the beaches at Cove Point. Immature specimens were in the majority. Very common.
<u>Yellow-throated Warbler</u>	<i>Dendroica d. dominica</i> Several birds of this species observed in woods above the Calvert Cliffs.
<u>English Sparrow</u>	<i>Passer d. domesticus</i> This pest was everywhere as usual, except in heavy woods.
<u>Meadowlark</u>	<i>Sturnella m. magna</i> Found in nearly every field at both localities.
<u>Red-wing Blackbird</u>	<i>Agelaius p. phoenicius</i> A large flock was observed several times near the marshes at Cove Point.
<u>Purple Grackle</u>	<i>Quiscalus q. quiscula</i> Common in and near the town at Solomon's Island.
<u>Cardinal</u>	<i>Richmondena c. cardinalis</i> Common near open woodland.
<u>Goldfinch</u>	<i>Spinus t. tristis</i> Fairly common, probably breeding although I found no nests.
<u>Field Sparrow</u>	<i>Spizella p. pusilla</i> Observed several of these birds every time I traveled from Solomon's Island to Cove Point.
<u>Swamp Sparrow</u>	<i>Melospiza georgiana</i> Common near marshes at Cove Point.
<u>Song Sparrow</u>	<i>Melospiza m. melodia</i> Common near both localities.

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 discusses the general principles  
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NOTESMeetings and Lectures at the Society

June 2 - Talk by Mr. Irving E. Hampe, "Feathers."

June 9 - Talk by Mr. L. Bryant Mather, Jr., "Role of Water in Natural Sciences."

June 23 - Talk by Mr. Louis Putens, "Breeding and Egg laying of the Wood Frog."

June 16 - Lecture by Mr. Benjamin Kurtz, "Indians of North America and Mexico."

June 30 - Talk by Mr. T. Milton Oler, Jr., "The Folsom Points as Evidence of Prehistoric Man in the United States."

June 6 - Junior meeting. Lecture by Mr. Edward McColgan, "Ancient Egypt."

June 13 - Junior meeting. Talk by Elias Cohen, "Mythology and Superstitions of Snakes."

June 20 - Junior meeting. Lecture by Mr. Andrew Goss, "Our Maryland Indians and How They Lived."

Lectures to Outside Organizations

June 5 - To the Quill and Scroll Club Baltimore City College by Mr. John B. Calder, "Fossils."

June 7 - To the Bible Class of Zion Evangelical Reformed Church by Mr. Elra M. Palmer, "God and Science."

June 12 - To Girls' Scout Troop, Brooklyn, by Mr. Eugene R. Polacek, "History of Insects with Special Reference to the Cecropia and Silk Moths."

Field Trip

June 7 - The Annual Field Trip of the Rocks and Minerals Association in Maryland was as usual conducted by the Department of Mineralogy.

Exhibition

June 2 - An exhibition of Insects, Birds, and Nature Photographs was held at the Annual Exhibition of the Frederick Garden Club, Frederick, Maryland.

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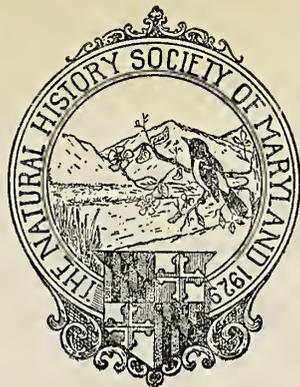
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*The Natural History*



*Society of Maryland*

## BULLETIN



Volume VI

JULY, 1936

Number 11

### NOTES ON SOME RARE LOCAL PLANTS

By John B. Egerton

Notwithstanding the ravages of forest fires and certain attempts to clean up our woodlands, a few patches of the Sweet Pinesap or Schweinitzia (*Monotropis odorata*) are still to be found in pine woods along the Severn River. Of a rich clovelike fragrance, this brownish purple plant is not at all conspicuous; but being one of our rarest plants is watched and cherished year after year and it is always a pleasure to be able to report that it is "still there". In addition to the distinction of extreme rarity, it is also our earliest plant to bloom! Fully formed flowers are often found in December and if the weather is favorable, they open in January.

Swamp Pink (*Helonias bullata*) is another rare and retiring plant that appeals to all who admire modest beauty more than vain show. So unobtrusive is this beautiful pink flower, that it is little known locally even to botanists. It prefers the seclusion of almost inaccessible stream beds, where it flourishes on little hummocks just above water level, protected from outside interference by masses of entangled Greenbrier, in the same general locality as Schweinitzia; but it is by no means wide-spread with us. Our search for it this year was rewarded by finding it in luxuriant bloom towards the end of April; but it seems to have disappeared from several places where it once grew in greater abundance.

On May second, just coming in flower another very rare plant hereabouts was found, apparently the first time for many years. Not one in the party recognized it at the time, though all placed it among the Ranunculaceae as possibly a near relative of Black Cohosh. It really turned out to be Golden Seal (*Hydrastis canadensis*) sometimes called Orange Root and Yellow Puccoon. Though once common enough to the north and west of us, it does not appear in the local check lists of the plants of Baltimore and Vicinity since that of Wm. E.A. Aiken, published in the Transactions of the Maryland Academy of Sciences and Literature

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in 1837. Hence the refinding of this plant growing wild seems worthy of note.

Another plant usually classed as rare was found just coming into bloom May 16 in quite abundance on the shady hillsides west of Cockeysville. Like other members of the Orchis Family, the finding of which is usually accompanied with a thrill, whether the flowers are particularly attractive or not, the finding of dozens of plants of *Pogonia verticillata* in bloom at this place was the occasion of considerable satisfaction, for it was the special object of this outing, originally planned some two years ago.

In addition to the rarities mentioned above, numbers varying from fifty to around a hundred other flowers have been found in bloom on each of our Saturday afternoon trips since the middle of April.

#### ADDER'S-TONGUE FERN - OPHIOGLOSSUM VULGATIM

By Clyde F. Reed.

On one of our field trips this month, we had the pleasure of unexpectedly coming across one of Maryland's rarest ferns, the Adder's Tongue Fern. The trip was along the Cross Country Boulevard near Western Run.

Because of the hills and gradual sloping of the leaf mold laden soil several springs are prevalent, widening out into bogs before reaching the stream. In one of these bogs among Cardinal Flowers (*Lobelia cardinalis*) Agrimony (*Agrimonia Eupatoria*), Monkey Flowers (*Mimulus alatus*) and Skunk Cabbage (*Symplocarpus foetidus*), we found the Adder's Tongue Fern. There were over a dozen plants thereabouts.

According to Mr. John B. Egerton, the plant is very rare and since 1888 he has only seen the fern four times. Last August 28 we saw it at Nanjemoy Creek, near Riverside, Maryland.

The plant suggests an orchid at a distance. However, the leaves have no main midrib, and the veins form small meshes enclosed in larger ones. The plants are usually solitary, but we found a group of seven which was less than a square yard in circumference. Also the simple fertile spike has two ranks of sporangia which are filled with sulfur-yellow spores. The fertile spike is surrounded at the lower end by the stipe of the frond as seen in the diagram. The plants are from two to twelve inches high.

#### SOME SNAKE MYTHS

By H. Charles Robertson

Superstition and weird stories have been in circulation about reptiles for ages. The serpent seems to have always been the least understood member of the reptile clan; consequently, there

Received of the Treasurer of the United States  
the sum of \$100.00 for the year ending  
June 30, 1917.

Witness my hand and the seal of the  
Department of the Interior at Washington  
this 1st day of July, 1917.

Secretary of the Interior

Approved: \_\_\_\_\_  
Special Agent in Charge

Received of the Treasurer of the United States  
the sum of \$100.00 for the year ending  
June 30, 1917.

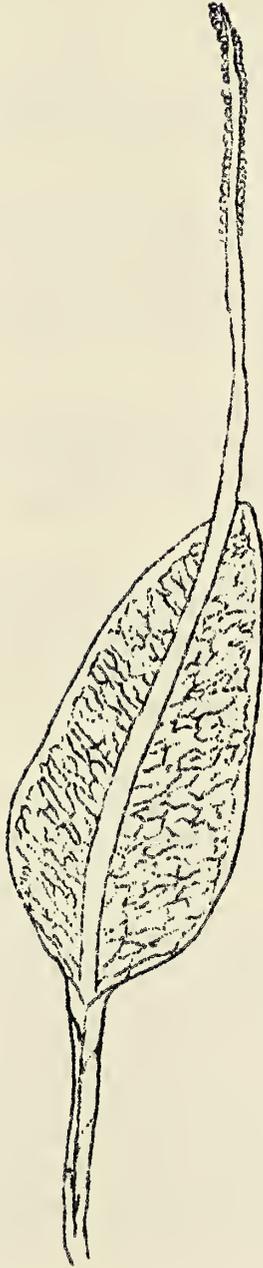
Witness my hand and the seal of the  
Department of the Interior at Washington  
this 1st day of July, 1917.

Approved: \_\_\_\_\_  
Special Agent in Charge

Received of the Treasurer of the United States  
the sum of \$100.00 for the year ending  
June 30, 1917.

Witness my hand and the seal of the  
Department of the Interior at Washington  
this 1st day of July, 1917.

Approved: \_\_\_\_\_  
Special Agent in Charge



*Ophioglossum vulgatum*



Leaf of *Salix caprea* L.

now exists more unnatural stories about reptiles than any other form of life.

According to superstition, reptiles possess a strange hypnotic power and exercise it upon birds and other animals. The breath of some species is supposed to be poisonous and some say a bite from any serpent will cause death. Moreover, it is said that serpents lie in readiness to jump upon an intruder, chase him or commit some other horrifying act that serpents are believed to do.

As a result of such stories there is little wonder that a great number of persons detest reptiles, especially the serpents which they usually destroy at sight!

When a man begins life there is no instinctive fear of reptiles. I have personally conducted experiments to clarify this. The fear of serpents is acquired and increases in some cases (due to tales that have been heard) to such an extent that the sudden appearance of a serpent will cause hysteria.

In Maryland there are only two serpents that are dangerous to man. The rattlesnake (*Crotalus Horridus*) and the copperhead (*Agkistrodon Mokusen*). If these serpents are avoided the rest of the native serpents are harmless.

I have assiduously listened to many snake stories and often have attempted to explain the origin of them. Some of the more popular stories are: the hoop snake, snakes that swallow their young to protect them from danger, and snakes that charm birds. These stories are not true and can be disproven by any herpetologist.

That young serpents occasionally are found inside of a mutilated adult cannot be denied. But this can be logically explained. There is no proof that they were swallowed to protect them.

There are a large number of viviparous species that retain the young until they are fully developed and when born these young ones are capable of caring for themselves. The venomous serpents are born with fully developed poison apparatus. When a gravid, viviparous (live bearing) serpent is slaughtered, it may leave a number of young of sufficient development to crawl away. This would create the illusion that the parent swallowed them to insure their safety, especially to persons with superactive imaginations. Serpents never exhibit any maternal interest in their young. They are left to take care of themselves directly after birth.

Several serpents found in Maryland are true cannibals; e.g., the king snakes of the genus *Lampropeltis*. They subsist upon a diet of frogs, lizards, and serpents; quickly, they overpower and engulf serpents of size equal their own. Digestive juices in a serpent's stomach are so potent as to dissolve animal tissue in a few hours. Hair, bone, and claws of animals are readily dissolved and assimilated. Such powerful juices would destroy a young serpent in a short time. If the victim did not reach the

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stomach directly, suffocation would be inevitable.

A serpent that swallows another does so to satisfy its appetite, not to protect the victim. Serpents have no hypnotic influence over any other animal. One snake story tells of blacksnakes charming birds. Birds have been observed to fly repeatedly very close to a blacksnake upon a tree limb, eventually being seized and promptly devoured by the serpent. The antics of the bird prompt the idea that it was under some weird power exercised by the reptile.

Some serpents are agile climbers and ascend trees in search of birds and nests containing eggs. This happens when there is a shortage of rodents as food for the serpent. A bird observing a serpent near her nest will do everything in her power to divert its attention away from the eggs. She will fly as close to the serpent as she dares, sometimes feigning exhaustion. In the meantime the serpent cautiously advances, maneuvering its body into "S" shaped loops. Finally when the bird comes within striking range, the reptile seizes it. The birds are deceived by the loops in the body of the serpent and underestimate its striking range; therefore, the birds are outwitted and not hypnotized as superstition would have us believe.

Those afraid of reptiles can easily overcome their fear by applying a little reason to that which they observe. Remember that serpents are afraid of man and will escape whenever escape is possible.

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#### NOTES

##### Meetings and Lectures at the Society

- July 7 - Talk by Mr. Joseph White, "Protective Devices of Fish."
- 21 - Talk by Mr. Gilbert C. Klingel, "The Dismal Swamp."
- 28 - Talk by Mr. Frank Yingling, "Sharks, Skates, and Rays."

##### Lectures to Outside Organizations

- July 1 - To Biological Laboratory, Solomons Island by Mr. Gilbert C. Klingel, "Shipwrecked on Inagua."

##### Junior Division Activities

- July 11 - Lecture by Clyde Reed, "Fungi."
- 18 - Talk by Francis Wise, "The Gold Deposits of Maryland."
- 25 - Hike to Gwynns Falls Quarry.

Dear Sir,  
I have the honor to acknowledge the receipt of your letter of the 15th inst. in relation to the above mentioned matter. I am sorry to hear that you are not satisfied with the result of the investigation. I will endeavor to do all in my power to rectify the same.

I have caused the matter to be reviewed by the proper authorities and they have decided in favor of the same. I am sure that you will be satisfied with the result. I will be glad to hear from you again should you have any further business with me.

I am, Sir, very respectfully,  
Your obedient servant,  
J. H. [Name]

Very truly yours,  
J. H. [Name]

I have the honor to acknowledge the receipt of your letter of the 15th inst. in relation to the above mentioned matter. I am sorry to hear that you are not satisfied with the result of the investigation. I will endeavor to do all in my power to rectify the same.

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Your obedient servant,  
J. H. [Name]

SPECIAL NATURE STUDY COURSES

A special course in Nature was offered to children from the ages of twelve to eighteen at the Maryland House, July 14 to July 31. The courses were under the direction of Mr. Elra M. Palmer, Director of Education, assisted by Mr. Edmund B. Fladung, President of the Society. Courses were conducted in Bird Life, Insect Life, Reptile Life, Plant Life and Rocks and Minerals.

## ATTENDANCE

Children from ages of twelve to eighteen	42
Adults for observation purposes	5
	<hr/>
Total	47

Certificates were awarded to twenty-seven children successfully completing work in one or more of the six subjects. The number of subjects completed by these children were fifty-five. One to three prizes were awarded for proficiency in each subject.

Trustees Meeting

July 22 - The quarterly meeting of the Board of Trustees. The following Staff was appointed for the year:- Mineralogy, Mr. Walter E. Price, Jr. Curator; Paleontology, Mr. Elra M. Palmer, Curator; Botany, Prof. John B. Egerton, Curator; Marine Life, Mr. Gilbert C. Klingel, Curator; Entomology, Mr. Elmo Masters, Curator; Herpetology, Mr. George Maugans, Acting Curator; Ornithology, Mr. Irvin E. Hampe, Curator; Archaeology, Mr. Richard E. Stearns, Curator; Library, Mr. Earl H. Palmer, Librarian; Publication, Mr. Herbert C. Moore, Editor; Education, Mr. Elra M. Palmer, Director; Museum Committee, Mr. Edmund B. Fladung, Director, Mr. Gilbert C. Klingel, Mr. Elra M. Palmer and Mr. Frederick Saffran, Jr.

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THE HISTORY OF THE UNITED STATES

CHAPTER I  
THE DISCOVERY OF AMERICA  
The first discovery of America was made by Christopher Columbus in 1492. He sailed from Spain in search of a westward route to the Indies. On October 12, 1492, he landed on the island of San Salvador in the West Indies. This event marked the beginning of European exploration and settlement in the Americas.

CHAPTER II  
THE EARLY YEARS OF THE COLONIES  
The early years of the colonies were marked by struggle and hardship. The settlers faced a hostile environment and a lack of resources. Despite these challenges, they established a foothold in the New World and began to develop their own societies.

CHAPTER III  
THE GROWTH OF THE COLONIES  
The colonies grew rapidly in the 17th century. The population increased, and the economy diversified. The settlers began to assert their independence from England, leading to a series of conflicts that culminated in the American Revolution.

CHAPTER IV  
THE AMERICAN REVOLUTION  
The American Revolution was a war for independence from British rule. It began in 1775 and ended in 1783. The revolution resulted in the creation of the United States of America, a new nation based on the principles of liberty and democracy. The Declaration of Independence, signed in 1776, laid out the colonists' grievances against the British and their desire for self-governance.



**BULLETIN**



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Volume VI

AUGUST, 1936

Number 12

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ONE OF MARYLAND'S MOST COMMON SNAKES

By Elias Cohen

One of the most common snakes in the State of Maryland is Dekay's Snake (*Storeria dekayi*), often confused with the Garter Snake by the layman. In localities where few other serpents are to be found, Dekay's Snake is usually found in great numbers.

One of the best places for observing and collecting this species is the brickyard owned by the Baltimore Brick Company toward the end of East Monument Street, between that street and Philadelphia Avenue, in the northeast section of Baltimore. There among piles of broken brick scattered about the large kilns used for heating sand, this snake is very common. Deserted graveyards and rocky fields throughout Baltimore County provide excellent locations for observing these serpents. The best time of the day to collect them is late afternoon or evening. Many of the writer's specimens have been captured at night with the aid of a flashlight.

The coloration of Dekay's Snake is not vivid. In the adult the dorsal surface is of a uniform brown or tan (appearing to be gray), with a double row of dark brown spots running down the middle of the body. In some color phases the central area between these spots is of a lighter tint than the ground color, imparting to these snakes the effect of an indistinct stripe. The head is dark brown with three bands of the same color on each side of the head. The abdomen is either white or gray usually tinted with pink, and bordering the ventral plates are faint specks of a very dark brown.

A new-born Dekay's Snake is dark brown, almost black, the dark spots being barely visible. There is a light-colored ring composed of two blotches about the neck, and there is a blotch of the same color behind each eye. The abdomen is gray with no pinkish tint visible.

Dekay's Snake should not be mistaken for the Garter Snake (*Thamnophis sirtalis sirtalis*), which has a yellow stripe on each side of the body, located on the second and third rows of scales, counting upward from the abdominal plates. The Garter Snake's



WILLIAM B. ...

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ROUGH  
SKETCH  
ADULT DEKAY'S  
SNAKE  
(NATURAL SIZE)



NEW-BORN DEKAY'S  
SNAKE  
(NATURAL SIZE)



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ground color is dark brown or olive brown.

Dekay's Snake is a keel-scaled serpent, usually having seventeen rows of scales about the body. There are seven upper lip labials and the anal plate is divided.

This serpent is, on an average, about one foot in length. However fifteen inch specimens are not rare.

Dekay's Snake is viviparous (live bearing), giving birth to from twelve to twenty young. Each little snake is extruded inside of an oval shaped, jelly-like container. The serpent bursts through this in a few seconds and is about eighty-three mm. in length, and no thicker than a matchstick. It opens its mouth and rubs the jaws against rough projections to get rid of the sticky substance of the egg sac. A few minutes later the young reptile sheds its skin for the first time. Dekay's Snake comes out of hibernation as early as March, mating taking place in late April or May, and the young are born during late August and early September.

Near the base of the snake's tail there are a pair of glands secreting a musky fluid, which is discharged when the snake is excited or handled in the wild state. This is a protective defense used by the snake against its enemies.

The natural food of this serpent is the earthworm, although insect larvae and salamanders are also eaten.

Dekay's Snake is entirely harmless and cannot be induced to bite. The fact that it feeds upon insect larvae causes it to be of some, if not large, economic importance and it should not be destroyed.

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## TWO EARLY SPRING FROGS

By Louis A. Putens

Each spring I have eagerly awaited the arrival of our two well known frogs, the Woodfrog (*Rana sylvatica*) and the Spring Peeper (*Hyla crucifer*). These two species, the first of the frogs to become active, seem to emerge almost at the same time.

Since 1934 our Department has been observing the Woodfrog and the Spring Peeper at Glenartney, Maryland. This locality is situated on a low strip of land, roughly three-quarters of a mile long, bordered on one side by the Patapsco River, and on the other by the Baltimore and Ohio Railway tracks. In this section of flat open meadow there are only two small ponds which contain water throughout the year. However from March until May about one-third of this area is flooded from melting snow and heavy rain. In depth the submerged section varies from one to one and one half feet.

These conditions provide an ideal breeding ground for many amphibians. The Woodfrog is so abundant here that I have counted thirty or forty in a space about ten yards square. The Spring Peeper is not so easily seen, but I am sure they equal *R. sylvatica* in numbers.

THE UNIVERSITY OF CHICAGO  
DIVISION OF THE PHYSICAL SCIENCES  
DEPARTMENT OF CHEMISTRY

REPORT OF THE RESEARCH GROUP ON  
THE CHEMISTRY OF THE SOLID STATE

FOR THE YEAR 1954-1955  
BY  
ROBERT H. EMMETT, JR.  
AND  
WALTER H. ZIEGLER, JR.

CHICAGO, ILLINOIS  
1955

RESEARCH REPORT NO. 10

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*H. crucifer* is usually thought to be the earliest arrival among the frogs, but over a period of three years in the Patapsco valley I have found them just a little later than *R. sylvatica*.

In 1935, we found *R. sylvatica* breeding as early as March 3rd. On this particular day the weather was very warm for that time of the year, the temperature of the air being 78 degrees F, and that of the water 55 degrees F.

Woodfrogs have the ability to withstand very low temperatures. On the night of March 9, 1935 we found them in large numbers at a temperature of 32 degrees F. Their mating season ends in the latter part of May or the first of June. May 27, 1934 is the latest breeding record we have.

This attractive member of the genus *Rana* is one of our most beautifully colored frogs: It is light tan with delicate pink shadings on the back; the under parts are white. On each side of the head, back of the angle of the jaw and below the eye is a triangular brown spot. But the colors of the Woodfrog are difficult to describe and only by watching them in their natural haunts can one fully appreciate their dainty markings.

Their call is a guttural croaking sound repeated at short intervals. Easily distinguished from the piping of *H. crucifer*, yet blending perfectly, the call of *Sylvatica* forms the deeper, louder part of the frog chorus.

Soon after their eggs are laid the Woodfrogs leave the water and scatter to the woods and fields nearby. Although they favor damp cool places they are often found long distances from water. Almost fearless in the spring, later in the season they become shy and hard to find.

Hibernation takes place at the beginning of cold weather. I found one specimen in a torpid condition on November 11, 1934 under four inches of leaves in upland woods.

We found *H. crucifer* on March 9, 1935 at a temperature of 32 degrees F. Their breeding season is about the same as *Sylvatica*, March to May. Their habits are similar in some ways to those of the Woodfrog and they can be found in the woods of the Patapsco throughout the spring and summer. Very often after a shower when the sun is hidden and the foliage is still wet I have heard the shrill calls of the little tree frog. On trees and bushes or plants such as the Jack-in-the-Pulpit or May Apple they are quite at home.

As they cling with their sticky toe-pads to the under side of a leaf, or make astonishingly long leaps to capture insects they are a never ending source of interest and amusement to the naturalist.

Varying from three-quarters to one and one-quarter inches in length *H. crucifer* is the smallest of Maryland tree frogs. Light gray or pale yellow in color its name is taken from the markings on the back which resemble a cross!

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Once heard, their sweet high-pitched trill is not easily forgotten. Their voices are often taken for the calls of some small bird. Much has been written about these little fellows and they should become well known to us all.

The Woodfrog seems to be more noisy during the day, while the Peeper is easier to find and shows more activity at night. However, they can both be heard constantly from early March until the first summer days.

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### THE WHITE SQUIRREL OF PRINCETON

For some years I have heard of a white squirrel on the campus of Princeton University but I never saw it until my last visit, when I at last had a close view. The animal is a real albino, white, not grey; in size and build conforming to the grey type. All agree in describing its tail as rather "moth eaten" but this may be from its being partly grey.

Those who have seen it very close, state the eyes to be red, as is proper to an albino, but from the distance of my view they looked black. There did not seem to be any weakness in them as the animal seemed to have as keen a sight as other squirrels, though it was a sunshiny day.

This interesting little fellow has been about the campus for eight years. It is very wary as many have tried to catch it, but it did not seem to me to have any real dread of human beings as it sat in the fork of a tree and watched our party, apparently with much interest.

Edward McColgan

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### Meetings and Lectures at the Society

August 3 - Talk by Mr. Edward McColgan, "The Turkey Buzzard."

August 11 - Talk by Mr. George Maugans, "The Fathers of Herpetology in the United States."

August 18 - Talk by Mr. John B. Egerton, "The Smallest Flowering Plant."

August 25 - Talk by Mr. C. H. Kolb, Jr., "The Marine Life of Hog Island, Maine."

The first part of the report deals with the general situation of the country and the progress of the work during the year.

The second part contains a detailed account of the work done in the various departments and the results obtained.

### REPORT ON THE WORK OF THE DEPARTMENT

The work of the department during the year has been carried out in accordance with the programme of work approved by the Council.

The first part of the report deals with the general situation of the country and the progress of the work during the year.

The second part contains a detailed account of the work done in the various departments and the results obtained.

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Exhibition.

August 1 - Exhibition of Minerals at Enoch Pratt Library,  
Branch #12.

August 1 - Exhibit of Butterflies and Moths at Enoch Pratt  
Library, Branch #24.

August 17 - Exhibit of Minerals at Enoch Pratt Library, Central  
Branch.

Junior Division Activities

August 1 - Lecture by Mr. E. R. Polacek, "The Silk Moth."

August 8 - Talk by Francis Groves, "Snakes"; Elias Cohen,  
"Preadaptation of Amphibians."

August 15 - General discussion.









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