REPORT OF THE COMMITTEE ON PALEOBOTANY

November 15, 1944

(Appendix J of Annual Report of Division)

with

Bibliography of Paleobotany
in North America
June 1, 1943 – April 1, 1944

Committee Members

Erling Dorf, Chairman
Charles F. Read
Harry D. MacGinitie
James H. Schopf
Summary

The Report of the Committee on Paleobotany is a record of the progress made during the year in paleobotanical research in America and of the general activities of paleobotanists. It contains the titles, and in most cases the authors' abstracts, of 42 paleobotanical papers published since the compilation of last year's Report; also recorded are 21 papers completed and in press, and 54 paleobotanical projects in progress. These figures show a reduction of about 10% in the number of paleobotanical papers published or in press, as compared to the same period of last year, and an increase of 58% in specific projects under study.

Progress in paleobotanical research has naturally been hindered by the war-service activities, which are listed in the Report. Among the active paleobotanical workers of the country, replies to the questionnaire indicate that 7 are at present serving in the Armed Forces, 12 are engaged in field or laboratory War Research, and 10 are teaching part or full-time in Army or Navy college programs.

Erling Dorf, Chairman.
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REPORT OF THE COMMITTEE ON PALEOBOTANY,

1943-1944

The Committee on Paleobotany herewith presents its sixteenth annual report to the National Research Council and to the Paleobotanists working in America. The material in this report has been compiled from replies to a questionnaire sent out in March 1944. The committee expresses its thanks to those who submitted replies; for inadvertent errors or omissions the Chairman assumes responsibility.

The Committee wishes to record with sincere regret the death of Professor James Elias Cribbs on August 1, 1942. Professor Cribbs was the author of several outstanding papers on the internal structure of petrified remains of primitive cordaitoans from the Mississippian of Missouri.

Meetings: Because of the war only a few meetings of scientific organizations were held during the period covered by this report. According to information received, only one paleobotanical paper was presented at a scientific meeting: "Calcicbous algae as useful microfossils" was presented by Professor J. Harlan Johnson at the 16th Annual Meeting of the Society of Economic Paleontologists and Mineralogists held in Dallas, Texas on March 23, 1944.

War Work: Paleobotanical workers throughout the country continue to apply their greatest efforts to the prosecution of the war, in teaching war courses, in strategic mineral investigations, or in the Armed Forces:

Andrews, Henry N. - Teaching Mathematics in Army program at Washington University, St. Louis.

Ashley, James - Army Air Forces.

Axelrod, Daniel I. - Army Air Forces in the south Pacific theatre.

Barkley, Fred A. - Teaching Biology to Navy V-12 premedical students, University of Texas.

Bentall, Roy - Investigating subsurface geology of Tennessee, for the Fuels Section, U. S. Geological Survey.

Berry, Willard - Teaching in Navy V-12 program at Duke University.

Blickle, Arthur H. - Has been teaching Geography and Geology in Army program and performing hospital laboratory work; commissioned as Lieutenant in April in Army.

Cain, Stanley A. - Teaching Geography to Army Air Corps students, 63rd College Training Detachment, University of Tennessee.

Chancy, Ralph W. - University representative of the Univ. of California War Council, and member of Selective Service Board 69, Berkeley, Calif.

Clements, Frederic E. - Consulting work for the Soil Conservation Service, and other federal agencies.

Dorf, Erling - Teaching Geography in Army program and Maps and Aerial Photos in Marine program at Princeton University; Chief Air Raid Warden, and Chairman, Red Cross Blood Donor Service, Princeton, N.J.

Glock, Waldo S. - Captain in Air Corps, serving at Headquarters, Army Air Forces, Washington, D.C.

Hanna, G. D. - Constructing and testing military optical elements at California Academy of Sciences.

Howell, B. F. - Teaching Geography in Army program at Princeton University.

Johnson, J. Harlan - Teaching A.S.T.T. in Army school at Colorado School of Mines, and investigating mercury deposits in the Big Bend country of Texas.

Knox, Arthur S. - Medical technician in the Army at Fort Bragg, N.C., and Fitzsimons General Hospital, Denver from Oct. 1942 to Apr. 1943; now working as petroleum geologist for Continental Oil Co., Corpus Christi, Texas.


MacGinitie, Harry D. - Teaching meteorology, Army Air Forces, Kirtland Field, New Mexico.

Otto, James H. - Doing bacteriological work in connection with the war effort at Mid-State Frozen Egg Corp., Indianapolis.

Peck, Raymond E. - Captain in Army Air Forces, teaching at San Antonio Aviation Cadet Center, San Antonio, Texas.

Potzger, J. E. - Teaching Geography in the 52nd C.T.D. at Butler University.

Radforth, Norman W. - Investigations of the Ontario lignite from the utilization viewpoint.


Sears, Paul B. — Working on soil conservation problems.

Thomas, Dale E. — Teaching meteorology and Aircrew Geography at Allegheny College, Meadville, Penna.

Mieland, C. R. — Of interest to all paleobotanists, writes that
"Fossil Cycad National Monument was finally set for development by the Bureau of Parks and Monuments, and twelve days later came Pearl Harbor! Several competent critics suggest that 'twelve days after the armistice the FCMN should be taken up and given the development already clearly outlined'. Here is a subject entirely unique in its scientific and educational values and of an appeal fully as much international as national. To bring and hold such a cultural objective in full view now means to the people of other lands adding a generous color to the war effort."

Williams, N. Y. — On Alaska road during summer of 1943 for Pacific Projects investigation.

Wilson, L. R. — Teaching Aeronautical Geography in the Army Air Unit at Coe College, Cedar Rapids, Iowa.

Critics — Two criticisms of the Annual Report have been received and are here recorded. The suggested changes have not been made in the present Report, pending further expressions of opinion from a larger number of paleobotanists. (1) One critic would prefer to see the bibliographic material arranged "in accord with the natural order of development", that is, first Pro-Cambrian, then Cambrian, etc., and Pleistocene and General at the end. (2) Another critic suggests that the Report should be more informal and regrets that "there is no place in the Reports, as they are planned, for statements on works in progress except listing them 'by titles only', that is, without abstracts or annotations."

The present Chairman fully realizes that there are arguments both pro and con regarding both of these suggestions; however, since no other correspondents have advocated such changes, the Chairman has followed the precedents set by previous chairmen. Further comments on both of these criticisms are hereby solicited.
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PUBLISHED AND UNPUBLISHED WORK IN AMERICAN PALEOBOTANY.

(An asterisk * indicates a published paper.)

General

Arnold, C. A.
Introduction to Paleobotany. Textbook submitted to McGraw Hill Company for publication after the war.

Barkley, Fred A.
Relationship between microorganisms and the formation of travertine.

Brown, Roland W.

* Some prehistoric trees of the United States. Jour. Forestry, vol. 41, pp. 661-668, 1943. The prehistoric forests of the United States once included species of trees that would now be regarded as exotic because their surviving relatives are inhabitants of other parts of the world, particularly eastern Asia. This distribution of the fossil and living species suggests former land connections and adaptations to physiographic and climatic changes during the Cenozoic era.

Bryan, Kirk.

Cain, Stanley A.
* Criteria for the indication of center of origin in plant geographical studies. Torreya, vol. 43, pp. 132-134, Dec. 1943. (Contributions from the Botanical Laboratory, The University of Tennessee, n. ser., No. 62). The criteria of C. C. Adams are re-examined in the light of modern studies with the general conclusion that there has been an over-emphasis of deductive reasoning in biogeography. Although not written from the paleobotanical viewpoint, this discussion should be of some value in attempts to determine centers of origin and routes of migration on a basis of fossils.


Campbell, D. H.
* Continental drift and plant distribution. Stanford University Press, 43 pp., Dec. 1943. The many and extensive changes in the relation of the continents to each other and to the oceans
surrounding them, have been of prime importance in the distribution of the many thousand plant species composing the floras of the different regions of the world.

It may be reasonably assumed that the temperate floras of the Northern and Southern Hemispheres originated independently in the boreal and austral continents, and were completely separated up to the end of the Mesozoic. The vegetation, both living and fossil, indicates that Eurasia and North America, have always been more or less intimately connected.

The Southern Continents show so many evidences of relationships in the floras, e.g., between New Zealand and Chile, and between West Africa and Brazil, that some former land connections must be assumed since most of the common species could not possibly have been transported over the oceans — by water or air currents — or by birds.

Du Toit's theory of continental drift would explain all of these problems.

Clements, F. E.

On the basis of experimental studies, phyletic charts are being developed to show the probable origin of important genera and their included species, with especial origin in the Permian and later wide differentiation and expansion in the Pleistocene.

Dachnowski-Stokes, A.F.


Report on sources of moss peat in the Province of Quebec, Canada (for the Dept. of Mines, P.Q., Can.)

Peat investigations of 1943 in the Province of Quebec, Canada (for the Dept. of Mines, P.Q., Can.)

Peat deposits of the world. An introduction to peat investigations.

Daka, N.C.

Compilation and description of the localities in the United States where fossil conifer cones and fossil wood showing worm hole borings have been found.

Clock, Weldon S.

Experiments and studies to determine the relations between tree growth and certain climatic factors, specifically, (a) secondary thickening in trees in relation to temperature and rainfall; (b) exact time or times of secondary thickening in trees;
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(c) relations of secondary thickening as to time and amounts among the branches of the same tree and among adjacent trees;
(d) time or times of tip growth during any one season; (e) effects of artificial freezing on living tissues in trees;
(f) regeneration of the cambium at various degrees of artificial freezing.

Johnson, J. Harlan
* Limestones formed by plants. The mines Magazine, vol. 33, pp. 526-533, 15 illus., Oct. 1943. A brief well-illustrated popular description of the formation of limestones by bacteria, Cocoliths, and Coccoliths and various types of lime-secreting algae. The limestones so formed are discussed and their principal characteristics are mentioned and illustrated. A short bibliography at the end indicates references of basic value to students of the subject.


Kosanke, R. W.

Radforth, Herman W.
The palynology and utilization of the Onakawana lignite.

Schopf, James N.

Wharton, J. R.

Wilson, L. R.
Spores and pollen as microfossils. In press, Botanical Review.

Wodehouse, Roger P.
* Atmospheric Pollen. Aerobiology. Pub. A.A.A.S. No. 17; pp. 8-31, firs. 1-120, 1942 (omitted from last year's Report). This publication is an atlas of all pollen-grain forms known to have been found in the air. Each pollen-grain form is illustrated, and all species which have the same form are listed, together with notes on such slight differences as may occur.
Appendix 1

CENOZOIC

Pleistocene and Recent

Pollen science continues to occupy the attention of numerous workers, as is indicated not only by the many published papers on pollen, but also by the interesting and informative Pollen Analysis Circulars, edited by Paul B. Sears, Oberlin College and printed and distributed by various co-workers.

Aldrich, John W.

Barkley, Fred A.
(with Tharp, B.C.) Peat bog borings.

Cain, Stanley A.
* A note on "Fossil evidence of wider post-Pleistocene range for butternut and hickory in Wisconsin." Rhodora, vol. 45, no. 107-109, 1943. This note is a criticism of a conclusion by Wilson and Webster that low percentages of Corylus and Juglans pollen are necessarily indicative of former boundary extensions of those genera. (Contributions from the Botanical Library, The University of Tennessee, n. ser. No. 60).

* Pollen analysis of some buried soils, Spartanburg County, South Carolina. Bull. Torrey Bot. Club, vol. 71 (1), pp. 11-22, Jan. 1944. These buried Piedmont soils are Pleistocene, possibly early post-Wisconsin. They provide considerable evidence for concluding that the climate was appreciably cooler at the time of the sedimentation. So far it has been impossible, however, either to date the soils or to estimate the extent of the cooling of the climate. Further studies on these soils are in progress. (Contributions from the Botanical Laboratory, The University of Tennessee, No. 70).


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An application of the meso-pollen technique to the problem of wind dissemination of spruce and fir pollen in the vicinity of the Great Smoky Mountains.

(and Louise G. Cain)
Size frequency studies of pine pollen.

Hansen, Henry F.

* Post-Pleistocene forest succession in northern Idaho. Amer.


Post-Pleistocene forest succession and climate in the Pacific Northwest.

Johnson, J. Harlan
Pleistocene fresh-water algal limestone from near Glencoe, Nevada.

Knox, Arthur S.
A postglacial chronology for eastern New England.
(See also under Sayles, Robert W.)

Krauss, Robert L., and Kent, George N.
* Analyses and correlations of four New Hampshire bogs. Ohio Jour.
  Sci., vol. 44 (1), pp. 11-17, 1944. These bogs are in southeastern New Hampshire within the drainage basin of the Merrimac River; all are post-Pleistocene and the analyses have been compared with studies by Devey in Connecticut and Potager in New Jersey. Climatic levels recognized by Sears and Devey are correlated with corresponding stages in these bogs. The authors find that "the warm dry postglacial period did not produce a northward movement of the Beech-Maple association nor any real shift of boundary at all, but rather that the xeric types found in this period represent the xeric series in their own respective associations".

Mason, Herbert L.

A Pleistocene flora from Point Arena, California.
Appendix 1

Patrick, Ruth
  Phila., vol. 95, pp. 53-110, 1943. Linsley Pond is located in
  the headwaters of Branford River, in North Branford. The di-
  atoms were studied from the peat cores which were made for pollen
  analysis. The deposits are all of Recent age. The deepest core
  is L-10. The first diatom flora is found at 40 ft. The flora
  consists of only a few species. Gradually the flora becomes
  more diversified. At a depth of 28 ft. a well developed
  eutrophic flora is first found. The flora remains much the
  same till near the top of the core when a great change occurs
  in the dominant species present. This recent change in the
  diatom flora may be due to the use of part of the drainage
  basin of the lake for agricultural purposes. One new species,
  Cymbella similis, is described.

A study of diatoms from the peat of Patschke Bog, Texas.

Potzger, J. E.
* Pollen profile from sediments of an extinct lake in Hendricks County,
  Indiana marks time of drainage. Proc. Indiana Acad. Sci., vol. 52,
  pp. 83-86, 1943. A pollen profile from a shallow peat deposit
  (6 feet) in a well-preserved lake basin in Hendricks County,
  Indiana (Early Wisconsin), was used to establish the approximate
  time when the lake was drained through a cut in the eastern
  embankment. Results showed that this occurred at the close of
  the characteristic spruce period and a strong invasion by oak
  (46 per cent), which in Indiana is a definite horizon marker
  when about 1/4 to 1/3 of the total sediment had accumulated.

* Pollen study of five bogs in Price and Sawyer counties, Wisconsin.
  Butler Univ. Bot. Stud., vol. 6, pp. 50-64, 1943. A study of
  pollen records of five bogs along highway 70, involving two
  counties. Succession of forests was from Canadian spruce to a
  long period where pine controlled almost exclusively, to pine-
  northern hardwoods (this latter in areas of better clay and
  loam soil). This suggests climatic changes from cold, or at
  least cool-moist, to cool-dry, to warmer-moist. The invasion
  by northern hardwoods may be due to more favorable moisture
  conditions and higher temperatures or to increasing frost-free
  growing seasons.

Potzger, J. E., and Tharp, B. G.
* Pollen record of Canadian spruce and fir from a Texas bog. Science,
  vol. 98 (2257), p. 274, 1943. Patschke Bog is located in Lee
  County, Texas. The preliminary pollen study shows a history of the
  vegetation with the following changes in composition: Canadian
  spruce-pine-oak-grasses, to oak-grasses, to pines, to alder, to
  chestnut-elder, to chestnut-oak-grasses, to oak-grasses.
The most significant discovery is a record of about to 5% of Canadian spruce and fir pollen, showing a former distribution of boreal species of at least 800 miles south of what was formerly assumed to have been the southern limit. The former range of chestnut, at least 100 miles westward of the present range limit, points to an eastward extension of drier climate during recent post-glacial times. Apparently the Texas climate of the region involved in this study was more cold and moist than today and had a series of fluctuations between decrease and increase in moisture, being at present in a cycle of reduced moisture, but having been drier still in early post-glacial times.

Potzger, J. E., and Keller, C. O.

Sayles, Robert W., and Knox, Arthur J.
Five fossiliferous tills and intertill beds on eastern Cape Cod are described. These tills contain marine sponge spicules, several species of marine diatoms, a few Radiolaria, and abundant pollen grains and spores of many species of plants. At Nobsconset Beach associated with fragments of Camaropsypsis thyoides in one of the intertill beds was a pollen flora suggesting a climate as warm or warmer than the present. In sand under glacial gravel at Highland Light were fragments of wood and pollen indicative of a cold climate. The fossils, it is believed, have been derived largely from an old interglacial marine deposit.

Wilson, Ira T., and Potzger, J. E.
Borings were made in four Minnesota lakes with the new Wilson sampler, which is not limited in its operation by sandy layers nor by great depths of water. The study shows that in sandy regions sampling in bogs and lakes for pollen studies must include the deposits of extremely fine sand because pollen of early tree invaders is included in such layers. In Aitken County forest succession was from spruce to spruce-pine, to pine, to pine-oak.

Wilson, L. R., and Webster, R. R.


Tertiary - General
Arnold, C. A.

Petrified woods from the western states.

Henry, Edward W.

Pliocene

Axelrod, Daniel I.
Late Tertiary floras from California and Oregon.

Pliocene floras from California and Nevada.

Chaney, Ralph W.
The flora of the Dalles formation.

The Troutdale flora of western Oregon.

The Ellensburg flora of Washington.

Miocene

Axelrod, Daniel I.
Miocene floras from California and Nevada.

Chaney, Ralph W.
Study of the Huckleberry flora of the John Day basin and adjacent areas.
Date, H. C.

* The Kamloops Petrified Forest. The Mineralogist, vol. 11, p. 30, 1943. The petrified forest situated between Vernon and Kamloops, British Columbia, Canada, has received only scant mention in the literature and remains practically unknown. The wood is well silicified, and includes complete tree sections of various sizes up to about 4 feet in diameter. The locality is situated at an elevation of about 5,000 feet, and comprises a series of benches, that appear to be the result of landslides. While some trees were observed in great profusion over an area comprising some 60 acres, no specimens were observed in the vertical position. Much of the wood is well preserved and appears to be of Miocene or post-Miocene age.

* Noted fossil forest locality. The Mineralogist, vol. 11, p. 201, 1943. Photo and short description of Kams Creek petrified forest, situated north of Waier, Idaho. This locality has produced many superb examples of huge tree sections, completely turned to common opal. In most specimens the wood structure has not been well preserved, and only a limited number of specimens are suitable for thin section study. While the locality includes a large area, Fourth of July Canyon produces the largest amount of material. The opalized logs are frequently exposed by erosion on the steep hillsides, and are found in a matrix of volcanic ash between flows of Miocene lavas. The wood is of middle Miocene age, and appears to be contemporaneous with the middle Miocene forests of Central Washington, and central Oregon.


Patrick, Ruth.

* Well-boring at Brandywine Lighthouse in Delaware Bay, Part II — Miocene Diatoms. Notulae Marine, Acad. Nat. Sci., Phila., No. 133, 1944. Evidence of a alston flora is found in the levels from 396-497 feet. Three new species: Mioceras enerl, Mioceras pinnatoides, and Mioceras sp. (probably are described. Two diatoms are recorded for the first time from the Miocene of eastern United States: Euphrasia samoanum and Miocene pinnatidum v. elegans. The deposit seems to be most nearly like the Miocene deposits of Maryland. It is definitely more closely related to the southern deposits than to those of New Jersey.
Oligocene

Detling, Le Roy E.
An Oligocene flora from six miles south of Eugene, Oregon.

Sanborn, Ethel I.
The Franklin Butte flora, from near Scio, Linn County, Oregon.

Eocene

Dorf, Erling
New species from the Green River formation, Wyoming.

Johnson, J. Herlan
Eocene Coralline algae from Mississippi.
Eocene Coralline algae from Borneo.

Sanborn, Ethel I.
An Eocene flora from Pilot Rock, Oregon.

Paleocene

Brown, Roland W.
Flora of the Fort Union and associated formations.

Dorf, Erling
A Fort Union flora associated with the late Paleocene Bear Creek mammalian fauna of southern Montana.
Appendix 1

MEXICO

Cretaceous

Bell, Walter A.
Lower Cretaceous floras of western Canada.

Brown, Roland W.

Dorf, Erling.
Plants from the Cretaceous Mesaverde group of Colorado and Wyoming.

Additions to the Lance flora of Wyoming.

Johnson, J. Harlan
* Algal reefs in the Cretaceous Austin chalk of Terlingua district, Brewster County, Texas. Amer. Assoc. Petr. Geol., Bull., vol. 28, pp. 123-130, Jan. 1944. A series of small algal reefs occur at the top of the Austin chalk at the base of a transition zone between the Austin chalk and the Taylor marl. The reefs described occur in section 248, Block G-4, about three miles east of the town of Terlingua. The reefs range in size from small lenticular masses of limestone to dome-shaped bodies twenty or twenty-five feet across and eight to ten feet high. They appear to have been formed in shallow water by sedimentary binding types of algae.

Cretaceous calcareous algae from Gillespie County, Texas.

MacNeil, Donald L.
Fossil plants from the Woodbine formation, Denton County, Texas. Submitted to Phila. Acad. Sci.

Schwartz, Jack
* A miniature petrified forest. The Mineralogist, vol. 11, p. 45, 1943. Description and photo of a small petrified forest area in East Chance Canyon, southern California, east of Los Angeles. Silicified palm roots of probable Cretaceous age are found in profusion in this region.

Wieland, G. R.
Memoir on the Mesaverde cycadoides.
Jurassic

Andrews, Henry N.

* On the vascular anatomy of the Cycadoid cone axis. Ann. Mo. Bot. Gard., vol. 30, pp. 421-427, 1943. A new cycad locality is reported from the Ferris Mountains of south central Wyoming. Petrified trunk fragments were obtained which had apparently weathered from the Jurassic Morrison formation, in all probability occupying the same or nearly the same horizon as the fossil cycads from the Freezout Hills some 50 miles to the east. The curious and complicated anatomy of the stem-peduncle stele transition is described in some detail.

Williams, M. Y.


Triassic

Berry, Willard
Triassic spores and fossil plants from Santee Dam, South Carolina.

Dorf, Erling and Bock, H.
Triassic plants from eastern Pennsylvania.

Paleozoic

Permian

Johnson, J. Harlan
New Permian algae from Texas and Oklahoma.

Stewart, P. R., and Stewart, B. K.
Studies in the "Dunkard series" of Pennsylvania.

Pennsylvanian

Andrews, Henry N.

Senitenberzaa plumeza (Artis) Radforth is described which compares closely with the English material described by Radforth. In view of certain minor differences it has been assigned a distinct varietal name (var. Jonesi). The presence of this Schizaeaceae species in the American Pennsylvanian is thus confirmed. Evidence is presented supporting the view that Peciateris plumeza var. dentata (Bgt.) White is the sterile foliage of Senitenberzaa plumeza var. Jonesi.

Arnold, C.A.

Flora of the Michigan Coal Basin.

Bell, Walter A.
Carboniferous rocks and fossil floras of northern Nova Scotia.
In press, Dept. of Mines and Resources, Geol. Surv., Canada.

Blickie, Arthur H.

A critical analysis of the Asterotheca-Scolopendria problem.

Knox, Arthur S.

Kosanke, R. M.
* A microfossil profile of certain Pennsylvanian coals of Ohio. Ill. Acad. Sci. Trans., vol. 36, no. 2, Dec. 1943. The characteristic plant microfossils of a number of Ohio coals were given in an effort to construct a profile or spectra which could be used in the correlation of the various coal beds. It is further suggested that the construction of such profiles would aid in determining the vegetational succession, which in turn might give a clue to the plant constituents of the coal beds.

Correlation of Illinois coals by plant microfossils. Presented before the Geological Section of the Iowa Academy of Science at Cedar Rapids, Iowa, April 19, 1946.

Determination of the plant microfossils in all of the Pennsylvanian coals in Illinois.

A fructification bearing 15 cones of Calamagrostachya sp.
Reed, Frances D.
Carnicocarp seeds from the Paleozoic of Iowa.

Schowe, R. K.
Note on a giant Kansas Calamite and the Ottawa fossil forest.
Paper presented at the meeting of the Kansas Academy of Science, Apr. 15, 1934.

Steidtmann, W. E.
* The anatomy and affinities of Medullosa loki Steidtmann, and associated foliage, roots, and seeds. Contr. Univ. Mich. Paleont. Lab., vol. 6, no. 7, pp. 131-166, Feb. 1, 1944. Medullosa loki, a large tristelar pteridospernum stem, is characterized by abundant, ubiquitous periderm. Medullosa granda new sp., has a regular peripheral arrangement of sclerotic strands, resin canals, and vascular bundles. The bundles of the pétioles resemble those of the cortex of the stem. Medullosa granda new sp. is redescribed to include the structure of the beak and micropyle, absent in the original material. Alethopteroid foliage is abundant everywhere. Locality - Calhoun Mine, Richland County, Illinois; horizon - Calhoun coal, upper part of the McLeansboro group of the Pennsylvania.

Wilson, L. R.
* Elater-bearing spores from the Pennsylvanian strata of Iowa.

(And Kosanke, R. M.)
Some unassigned plant microfossils of the Des Moines series of Iowa.

**Mississippian**

Elias, Maxim K.
Palaeoecoryne and other epizoic algae from Utah.

Johnson, V. Harlan


**Devonian**

Arnold, C. A.
Aneurophyton from the Devonian of New York.
Techniques

Arnold, C. A.
An inexpensive apparatus for cutting large rock specimens. Submitted to The Mineralogist.

Cross, A. T.

Hosking, J. H. and Cross, A. T.

Eliaz, Maxim K.
Adaptation of diluted hydrochloric acid in preparation of symbiotic and epizoic Paleozoic algae.

Redforth, Norman W.
Maceration and oxidation methods used in the study of the Onakawana lignites.

Sears, Paul E.

Committee Members
Charles B. Head
Harry D. MacDinitie
James H. Schopf

Enlking Dorf, Chairman
Wilson, Ira T. and Potzger, J. E.

Erling Dorf,
Chairman

Committee Members
Charles B. Read
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Appendix J

ADDRESSES

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Barkley, Fred A. - The Herbarium, Box 1620, University Station, Austin 12, Tex.
Bell, Walter A. - Geological Survey of Canada, Ottawa, Canada.
Bentall, Ray - State Div. of Geology, Nashville, Tenn.
Berry, Edward W. - Dept. of Geology, Johns Hopkins Univ., Baltimore, Md.
Berry, Willard - Dept. of Geology, Duke Univ., Durham, N.C.
Blickle, Arthur H. - Dept. of Geography and Geology, Ohio Univ., Athens, Ohio.
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Kent, George N. - Dept. of Botany, Oberlin College, Oberlin, Ohio.


Krauss, Robert W. - Dept. of Botany, Oberlin College, Oberlin, Ohio.

La Motte, Robert S. - 667 Aileen St., Oakland, Calif.

MacGinitie, Harry D. - Humboldt State College, Arcata, Calif.

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