

SCIENCE

VOL. LXI

JANUARY 23, 1925

No. 1569

CONTENTS

<i>The American Association for the Advancement of Science:</i>	
<i>The Origin of Cycads:</i> PROFESSOR CHARLES J. CHAMBERLAIN	73
<i>"Age and Area" in Relation to Extinction:</i> PROFESSOR S. J. HOLMES	77
<i>Alfred Hulse Brooks:</i> DR. GEORGE OTIS SMITH	80
<i>Scientific Events:</i>	
<i>Applied Science at the University of Brussels; Exhibition at the Carnegie Institution; Research Prize at the University of Virginia; The Formation of the American Society of Parasitologists; Appalachian Forest Research Council</i>	81
<i>Scientific Notes and News</i>	83
<i>University and Educational Notes</i>	86
<i>Discussion and Correspondence:</i>	
<i>The Population of Canada:</i> PROFESSOR EDWIN B. WILSON. <i>Haploid Males in Paracopidosomopsis:</i> PROFESSOR J. T. PATTERSON AND G. W. D. HAMLETT. <i>An Anatomical Spelling Match:</i> PROFESSOR H. B. LATIMER. <i>How Many Figures are Significant?</i> PROFESSOR JOHN SATTERLY	87
<i>Laboratory Apparatus and Methods:</i>	
<i>Staining Paramecium:</i> C. R. HALTER	90
<i>Special Articles:</i>	
<i>Tryparsamide Treatment of African Sleeping Sickness:</i> DR. LOUISE PEARCE. <i>Pancreatic Response to Carbohydrate Ingestion:</i> ELMER L. SEVRINGHAUS AND MARGARET E. SMITH. <i>The Effect of Fluorine on the Growth and Reproduction of Rats:</i> J. A. SCHULZ AND ALVIN R. LAMB	90
<i>The Indiana Academy of Science</i>	95
<i>Science News</i>	x

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKeen Cattell and published every Friday by

THE SCIENCE PRESS

Lancaster, Pa.

Garrison, N. Y.

New York City: Grand Central Terminal.

Annual Subscription, \$6.00. Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

Entered as second-class matter July 18, 1923, at the Post Office at Lancaster, Pa., under the Act of March 3, 1879.

THE ORIGIN OF THE CYCADS¹

THE widest gap in the evolution of plants used to be the one between the ferns and seed plants; but the researches of the past thirty years have bridged the gap so completely that the two groups are now separated only by the artificial definitions of the taxonomist.

The Cycadofilicales, which our British friends prefer to call the Pteridosperms, are the bridge. They looked like ferns and were naturally mistaken for ferns; and there is no doubt that their immediate ancestors were heterosporous ferns which had gradually developed the seed habit.

The forms already discovered have seeds much larger than the sporangia of any known heterosporous fern and almost as highly developed as those of the living Gymnosperms; but when the more primitive members shall have been discovered, we predict that the seeds will be comparatively small, developing from small ovules, containing still smaller female gametophytes, which will have little free nuclear division, or even none at all.

But the forms already discovered have the characters necessary to qualify them as the ancestors of the rest of the cycadophyte line; that is, the "fossil cycads" of the Mesozoic, more precisely known as the Bennettitales, and the living cycads, the Cycadales.

That the Paleozoic Cycadofilicales have given rise to the Mesozoic Bennettitales, or "fossil cycads," is practically certain. Researches upon the Paleozoic forms, especially by British botanists, and the magnificent researches of Wieland upon the Mesozoic Bennettitales have established this connection beyond any reasonable doubt. These Bennettitales were called "fossil cycads" because they were supposed to be the ancestors of the living cycads.

The living cycads, with one family, nine genera and about one hundred species, form a natural assemblage; but their geographic distribution, as well as their morphological characters, make it evident that the various genera have been separated for a long time, perhaps during most of the Mesozoic.

Dioon, with three species, is probably confined to Mexico.

Ceratozamia, with two species, may also be confined to Mexico. It has been reported beyond the

¹ Address of the vice-president and chairman of Section G—Botanical Sciences—American Association for the Advancement of Science, Washington, D. C., December, 1924.

School of Medicine Western Reserve University

Cleveland, Ohio

NEW LABORATORIES AND HOSPITALS
RESTRICTED CLASSES
THOROUGH INSTRUCTION
LARGE CLINICAL FACILITIES
HIGH STANDARD OF SCHOLARSHIP

Admission confined to students having academic degrees and to Seniors in Absentia.

For information address:

THE REGISTRAR

2109-15 Adelbert Rd.

CLEVELAND

Johns Hopkins University Medical School

The Medical School is an Integral Part of the University and is in the Closest Affiliation with the Johns Hopkins Hospital.

ADMISSION

Candidates for admission must be graduates of approved colleges or scientific schools with at least two years' instruction, including laboratory work in chemistry, and one year each in physics and biology, together with evidence of a reading knowledge of French and German.

Each class is limited to 75 students, men and women being admitted on the same terms. Except in unusual circumstances, applications for admission will not be considered after July 1st.

If vacancies occur, students from other institutions desiring advanced standing may be admitted to the second or third year provided they fulfill our requirements and present exceptional qualifications.

INSTRUCTION

The academic year begins the Tuesday nearest October 1, and closes the second Tuesday in June. The course of instruction occupies four years and especial emphasis is laid upon practical work in the laboratories, in the wards of the Hospital and in the dispensary.

TUITION

The charge for tuition is \$300 per annum, payable in three installments. There are no extra fees except for rental of microscope, certain expensive supplies, and laboratory breakage.

The annual announcement and application blanks may be obtained by addressing the

Dean of the Johns Hopkins Medical School,
Washington and Monument Sts., Baltimore, Md.

Summer Work for Graduates in Medicine

Beginning Monday, June 1st, and ending Saturday, July 11th, a course in medical diagnosis, including laboratory exercises in clinical pathology and demonstrations in pathological anatomy, will be offered. The course will be limited to thirty students, fee \$100. Applications should be made to the Dean's Office.

Yale University

SCHOOL of MEDICINE

FOUNDED 1812

Affiliated with the New Haven
Hospital and New Haven
Dispensary

For Information, Address:

The Registrar, Yale University
School of Medicine, New Haven,
Conn.

Fused Pure Silica
Vitreosil

Has the Smallest Expansion Known

For the construction of delicate scientific instruments requiring material with the smallest possible expansion, vitreosil tubes, plates, rods, etc., will be found invaluable, its linear expansion of .00000054 per degree Centigrade being the smallest known. The following table gives a comparison with other substances:

Material	Linear expansion per degree Centigrade
Fused silica00000054
Nickel steel (36 per cent. Ni)0000009
Glass, Jena 590000057
Glass, Pyrex 702 EJ0000035
Berlin Porcelain0000028

We shall be glad to assist you in solving problems where vitreosil may be useful.

THE THERMAL SYNDICATE, Ltd.

62 Schenectady Avenue,
BROOKLYN, N. Y.

Leading Universities
throughout the world use
Leitz Microscopes.

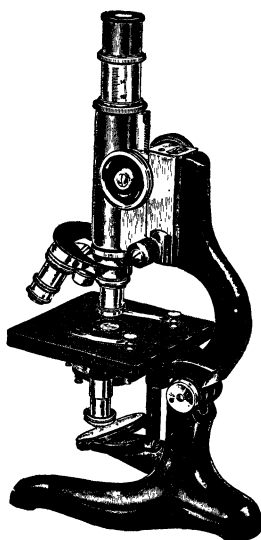
LEITZ

Leitz Microscopes are not
higher in price than others
of recognized standard.

College Microscopes

Models "L" and "LL"

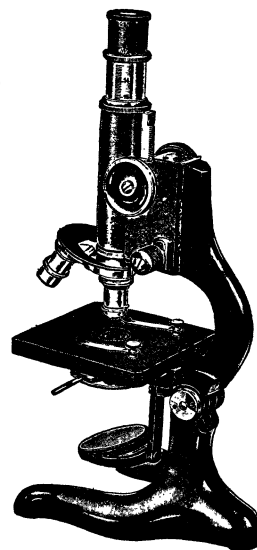
In Stock for Immediate Delivery



Model "L"

In precision of optical and mechanical workmanship the Microscopes "L" and "LL" are equal to the elaborate Leitz Research Microscopes, having however been simplified in their adjustments so as to give the greatest practical usefulness in class room and student laboratory work.

The Teaching Profession, through an ever increasing knowledge of the intimate technical details in the construction of scientific instruments, have been made to realize the advantages derived when selecting class room microscopes of superior quality and the attending feature of continuous satisfaction as well as economy through saving of repair expenses.



Model "LL"

Leitz Microscopes meet these requirements in an uncontested manner, their prices not being higher than other instruments of similar construction.

If the purchase of class room microscopes is anticipated, ask for our literature and estimate; we satisfy the most discriminating requirements and through the use of Leitz College Microscopes "L" and "LL," institutions will realize the importance of superior quality.

Ask for Pamphlet No. (O) 1001



60 EAST 10TH ST.



AGENTS

Pacific Coast States:

SPINDLER & SAUPPE, 86 Third St., San Francisco, Cal.

Canada:

J. F. HARTZ CO., Ltd., Toronto, Canada.

Philippine Islands:

BOTICA DE SANTA CRUZ, Manila, P. I.

Cuba:

TEXIDOR CO., Ltd., Habana, Cuba.

The Leitz Works are recognized as the creators of many important microscopical instruments.

Some of the new constructions offered by the Leitz Works caused a revolution in microscope models and optics.

UNDER THE EDITORSHIP OF J. McKEEN CATTELL

SCIENCE

A weekly journal, established in 1883, devoted to the advancement of the natural and exact sciences, the official organ of the American Association for the Advancement of Science, generally regarded as the professional journal of American men of science.

Annual Subscription \$6.00; single copies 15 cents.

SCHOOL AND SOCIETY

A weekly journal covering the field of education in relation to the problems of American democracy. Its objects are the advancement of education as a science and the adjustment of our lower and higher schools to the needs of modern life.

Annual Subscription \$5.00; single copies 15 cents.

THE SCIENTIFIC MONTHLY

An illustrated magazine, continuing the editorial policies of The Popular Science Monthly established in 1872, devoted to the diffusion of science, publishing articles by leading authorities in all departments of pure and applied science, including the applications of science to education and society.

Annual Subscription \$5.00; single copies 50 cents.

THE AMERICAN NATURALIST

A bi-monthly journal established in 1867, devoted to the biological sciences with special reference to the factors of organic evolution.

Annual Subscription \$5.00; single copies \$1.00.

AMERICAN MEN OF SCIENCE

A BIOGRAPHICAL DIRECTORY

The third edition of the Biographical Directory of AMERICAN MEN OF SCIENCE contains the records of more than 9,500 living men of science, as compared with about 4,000 in the first edition and about 5,500 in the second edition.

Price: Ten Dollars, net, postage paid.

THE SCIENCE PRESS

GRAND CENTRAL TERMINAL,

NEW YORK, N. Y.

SUBSCRIPTION ORDER

TO THE SCIENCE PRESS

GRAND CENTRAL TERMINAL, NEW YORK, N. Y.

Please find enclosed in payment of subscription to
..... for the year beginning

Name

Address

.....