

SCIENCE

VOL. LXXI

FRIDAY, APRIL 11, 1930

No. 1841

<i>Emergent Evolution and Hybridism:</i> DR. ROBERT K. NABOURS	371	<i>Scientific Apparatus and Laboratory Methods:</i>	
<i>Bibliochresis: the Pilot of Research:</i> PROFESSOR WILLIAM A. HAMOR and DR. LAWRENCE W. BASS	375	<i>Laboratory and Teaching Devices Made from Plaster of Paris:</i> ALVAH R. MCCLAUGHLIN. <i>Eliminating Opaquing by Alternating Black and White Backgrounds while Making a Photograph:</i> DR. FRANK P. MCWHORTER	392
<i>Obituary:</i>		<i>Special Articles:</i>	
<i>Stephen Alfred Forbes—A Tribute:</i> PROFESSOR HENRY B. WARD	378	<i>Components of Air in Relation to Animal Life:</i> DR. J. WILLARD HERSHEY. <i>Some Constituents of Derris and "Cube" Roots Other than Rotenone:</i> DR. E. P. CLARK	394
<i>Scientific Events:</i>		<i>Science News</i>	x
<i>The University Film Foundation of Harvard University; The U. S. Public Health Service; Chemistry at the Summer Quarter of the Ohio State University; Engineering Pageant</i>	381		
<i>Scientific Notes and News</i>	383		
<i>Discussion:</i>			
<i>A Sacrifice to Pele:</i> DR. G. R. WIELAND. <i>Branching Habits of the Hevea Rubber Tree:</i> O. F. COOK. <i>What is Control?:</i> PROFESSOR C. W. WOODWORTH. <i>Oestrus Following the Removal of One Ovary:</i> FREDERICK E. EMERY. <i>A New Record of Castoroides Ohioensis from Illinois:</i> DR. FRANK COLLINS BAKER. <i>Professional Ethics and the Artist:</i> JUSTUS F. MUELLER	386		
<i>Special Correspondence:</i>			
<i>Statement in Regard to Professor Einstein's Publications:</i> DR. W. F. G. SWANN. <i>Conference at Chichen Itza:</i> DR. A. V. KIDDER	390		

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

THE SCIENCE PRESS

New York City: Grand Central Terminal

Lancaster, Pa.

Garrison, N. Y.

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.

EMERGENT EVOLUTION AND HYBRIDISM

By Dr. ROBERT K. NABOURS

KANSAS AGRICULTURAL EXPERIMENT STATION AND CARNEGIE INSTITUTION, DEPARTMENT GENETICS

(THE essential supposition of emergence, or emergent evolution, appears to be that the product derived from the synthesis of any number of elements is often quantitatively and qualitatively supervenient over their mere sum, or resultant, and thus it becomes something chiefly novel, the important features of which may even be extraordinarily dissimilar from those of the elements and subgroups that entered into its composition.) The laws relating to and governing the whole are therefore comparably as restricted and peculiar to it as the laws relating to and controlling the respective components are exclusive and limited to them, and those of the one may not be even adumbrative of the others.

(It has been long recognized that familiarity with the attributes of elements does not confer the ability to prognosticate the qualities of the wholes resulting from their syntheses. The behavior of neither hydrogen nor oxygen gives the slightest suggestion of

the properties of water. The possibilities of gunpowder may not be deduced by an examination of the properties of either charcoal, sulphur or saltpeter, or of a combination of any two of them.) Carbon, hydrogen and oxygen, each examined with respect to its qualities, or any two together, afford no connotation of the characteristics of ethyl alcohol, if these elements be combined in the one way, or of the ether they make when there is another arrangement of them.

(The behavior of molecules may not be ascertained through a knowledge of merely the properties of their separate constitutive atoms; the molecular compounds do not present attributes which by simple additions result in the properties of cells; many of the properties of individual animals and plants are vastly different from the sums of the properties of the respective cells of which they are composed, and the qualities and appurtenances of plant, animal and



PURE PROTEINS OF MILK VS. CRUDE CASEIN

THE PURE PROTEINS of milk are so difficult and expensive to prepare, that only too often the crude products are inadvisedly used in researches of importance. One "crude essential element" of the diet may invalidate all other good features of a costly investigation, thereby disqualifying the deduction of the author.

In recent journals such papers have appeared.

"Crude Casein" of the usual industrial type represents simply an acid or rennet curd and is purely "Glorified Pot Cheese," containing unknown products of milk—in unknown amounts.

FOR RESEARCHES OF PRECISION

*"Casein - Harris" and
"Lactalbumin - Harris"
have been prepared*

Through years of study in the Protein Laboratory of Osborne & Mendel (Yale Univ. & Conn. Expt. Sta.), we have learned how to prepare these two proteins in state of highest molecular purity.

Each protein contains highest nitrogen content, lowest mineral ash, freedom from each other and other substances of cow's milk.

They are made directly from fresh skim milk, which is the only possible way to prepare them in high purity.

Assayed upon growing white rats.

Free from all vitamins.

AVERAGE ANALYSIS OF CASEIN—HARRIS

Moisture	10.73	Casein (N x 6.38) ..	87.09
Ash59	Ether-soluble20
Calcium	trace	Nitrogen;	
Nitrogen	13.66	water, fat, ash-free	15.44

(cf.—Osborne & Harris, Jr. Am. Chem. Soc., 25-IV, 346)

Also

Purest powdered Medicinal Yeast (standardized for Vitamines "B" (F & G) and Concentrates from this yeast.

Also

Vitamine factors, pure food mixes, deficient foods, salt mix and methods for vitamine assays upon the Norwegian white rat.

**THE
HARRIS LABORATORIES
TUCKAHOE NEW YORK**

School of Medicine Western Reserve University

Cleveland, Ohio

**NEW LABORATORIES AND
HOSPITALS**

RESTRICTED CLASSES

THOROUGH INSTRUCTION

LARGE CLINICAL FACILITIES

**HIGH STANDARD OF SCHOLAR-
SHIP**

Admission confined to students having aca-
demic degrees and to Seniors in Absentia.

For information address:

THE REGISTRAR
2109 Adelbert Rd. CLEVELAND

School of Medicine and Dentistry THE UNIVERSITY OF ROCHESTER

Medical School, Strong Memorial Hospital,
School of Nursing and Out-Patient Department of
the University of Rochester and the Municipal Hos-
pital of the City of Rochester, all under one roof.
Medical, Surgical, Obstetric, Pediatric, Dental,
Contagious and Neurological patients admitted.
Unusual opportunities for school and hospital co-
operation in medical and graduate dental teaching.

Admission

Medical candidates must have completed three
years of college work with special requirements in
chemistry, physics and biology. The entering class
will not exceed 50, men and women being admitted
on equal terms.

Tuition

Charge for tuition will be \$400 per annum, pay-
able in equal installments at the beginning of each
semester.

For information address

THE DEAN
School of Medicine and Dentistry
Crittenden Boulevard, Rochester, N. Y.

JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE

The School of Medicine 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 ap-
proved colleges or scientific schools with 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 a maximum of 75 students,
men and women being admitted on the same terms.
Applications may be sent any time during the aca-
demic year but not later than June 15th.

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

INSTRUCTION

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

TUITION

The charge for tuition for 1930-31 will be \$600 per
annum, payable in two installments. There are no
extra fees except for certain expensive supplies, and
laboratory breakage.

Inquiries should be addressed to the
**Executive Secretary of the School of Medicine, Johns
Hopkins University, Washington and
Monument Sts., Baltimore, Md.**

Graduates in Medicine who satisfy the require-
ments of the heads of the departments in which they
desire to work are accepted as students for a period
not less than three quarters. Tuition charge is \$50
a quarter.

BOSTON UNIVERSITY SCHOOL OF MEDICINE

ORGANIZED IN 1873

ANNOUNCEMENT

may be obtained by application to

THE REGISTRAR

80 East Concord Street,

Boston

Massachusetts

Ward's Natural Science Establishment, Inc.,

P. O. Box 24, Beechwood Station,
Rochester, New York.

**Owned and operated by the University
of Rochester in the interests of Science.**

Circulars free upon request on Mineralogy, Geology,
Paleontology and General Biology.

A few of our recent circulars are

- S-318 Mineral and Rock Collections
- S-243 Krantz Crystal Models
- S-319 Fossils: Collections, Models and Index
Fossils
- S-320 Relief Maps and Geological Models
- S-297 Insect Collections
- S-43 Entomological Supplies
- S-322 Skeletons and other Osteological Preparations
- S-324 Zoological Specimens for Exhibition and
Study
- S-321 Anatomical Models for Human and Com-
parative Anatomy
- S-42 Microscope Slides

The Frank A. Ward

Foundation of Natural Science of the
University of Rochester.

The New York Homeopathic Medical College and Flower Hospital

Offers opportunity for highest grade
medical training to one hundred
men and women selected competi-
tively.

In addition to thorough training
in the Preclinical Sciences and the
usual courses in Medicine and Sur-
gery, special emphasis is given to
Homeotherapy.

Seventy first annual announce-
ment mailed to those interested.

450 East 64th Street
New York City

TRIARCH BOTANICAL PRODUCTS

Live and Preserved Plants
Prepared Slides for General Botany
Special Preparations for Plant Pathology
Microscopes and Microprojectors

*"Prepared by a Botanist
for Botanists"*



Write for our illustrated catalog

GEO. H. CONANT
RIPON, WISCONSIN

Allegany School of Natural History

In Allegany State Park, Quaker Bridge, N. Y.

Fourth Season—July 5 to August 23, 1930

Registration limited to fifty

Field studies in Botany, Zoology, Geology, Birds
Natural conditions favorable in richness and vari-
ety, suitable laboratories and equipment, comfortable
living in a stimulating climate, guidance from ex-
perienced teachers and investigators.

Sponsored by the Buffalo Society of Natural Sci-
ences, the New York State Museum, and the Univer-
sity of Buffalo (with college credit).
For circulars or registration, address *until June 15:*

DR. ROBERT E. COKER, Director
Chapel Hill, N. C.

BIOLOGICAL and NATURAL HISTORY MATERIAL



Zoological	Groups
Embryological	Slides
Botanical	Life Histories

Drosophila cultures

Lamprey larvae (Ammocoetes)
Prices on demand

Catalogs on request: Address

Geo. M. Gray, Curator
Supply Department

MARINE BIOLOGICAL LABORATORY

Woods Hole, Mass., U. S. A.