

SCIENCE

VOL. LXVIII

DECEMBER 28, 1928

No. 1774

THE PLACE OF PHYSICS IN THE MODERN WORLD¹

CONTENTS

<i>The Place of Physics in the Modern World: PROFESSOR JOHN ZELENY</i>	629
<i>Bashford Dean: DR. WILLIAM K. GREGORY</i>	635
<i>Scientific Events:</i>	
<i>Yellow Fever in Africa; The British Institute of Radiology; The Bureau of Indian Affairs; The U. S. Coast and Geodetic Survey and the American Engineering Council</i>	638
<i>Scientific Notes and News</i>	640
<i>University and Educational Notes</i>	643
<i>Discussion and Correspondence:</i>	
<i>Pyrex Glass as a Radium Container: PROFESSOR S. C. LIND. A New Term for the 10⁻⁸ Centimeter Unit: DR. EDGAR T. WHERRY. The Excelsior Geyser, Yellowstone National Park: PROFESSOR EDWIN LINTON. Intermittent Vision: PROFESSOR C. E. FERREE</i>	643
<i>Quotations:</i>	
<i>The Minimum Living Salary of the Professor</i>	646
<i>Scientific Apparatus and Laboratory Methods:</i>	
<i>An Egg Shell Valve: DR. ALVAH R. McLAUGHLIN</i>	646
<i>Special Articles:</i>	
<i>The Heme Compounds in Nature and Biological Oxidations: DR. M. L. ANSON and DR. A. E. MIRSKY</i>	647
<i>The National Academy of Sciences</i>	648
<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

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.

THE subject on which I am to speak is without doubt a very appropriate one for this occasion. It has the one drawback that I can not hope to say anything upon it that will be new to this audience. Under these circumstances I could wish myself to be a word artist, having powers to clothe familiar figures in a new imagery. As it is, I shall have to content myself with passing before you in parade some old facts, bare and unadorned.

We are living at a time when science has won for itself a prominent place on the stage of human interests. The great benefits conferred upon the world by scientific discovery are generally recognized. The applications of science touch our lives at every point and at every turn. It is not too much to say that science has not only transformed the manner in which we live but has changed also in good measure the very subject of our daily thoughts.

The last fifty years are without precedent in physics as regards the number of far-reaching discoveries which have been made and as regards the new insight gained into the processes of nature. These years are unequalled in the number and importance of the applications of science which have been perfected.

One not conversant with the situation might well ask, "Can this expansion go on indefinitely, and are we not now approaching the end?" The same question could have been asked with even greater force thirty years ago. No one can look far into the future. Our answer to the question must be read in the fact that never before in all time has science invaded the realms of the unknown at so great a pace as it is now doing. There are no limits in sight. So rapidly does advance follow on advance that new achievements are proclaimed daily by the press. A special science service has been organized to interpret the significance of new findings to the people. Moreover, industry has never before leaned so heavily on what science has to tell.

It is not my purpose to allot credit for what has been accomplished, among the different sciences, or as between science and its applications. The different

¹ An address given November 30, 1928, at the dedication of the new physics laboratory of the University of Minnesota.

Public Health and Hygiene

New (2d)
Edition

By EMINENT AUTHORITIES

Edited by WILLIAM HALLOCK PARK, M.D.

Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College; Director of the Bureau of Laboratories, Department of Health, New York City

Octavo, 902 pages with 123 engravings. Cloth, \$9.00, net

Careful revision will be noted throughout as there have been many advances in this field since the publication of the first edition. Each section is contributed by a specialist and recognized authority who, however, has kept in mind that this work is written particularly for medical officers, public health nurses, physicians and medical students. The subjects are treated in a thoroughly practical manner.

Pharmacology and Therapeutics

New (9th)
Edition

By ARTHUR R. CUSHNY, M.A., M.D., LL.D., F.R.S.

Late Professor of Materia Medica and Pharmacology in the University of Edinburgh

Thoroughly Revised by

C. W. EDMUNDS, A.B., M.D.

Professor of Materia Medica and Therapeutics in the University of Michigan and

J. A. GUNN, M.A., M.D., D.Sc.

Professor of Pharmacology in the University of Oxford, Oxford, England

Octavo, 743 pages with 73 engravings. Cloth, \$6.00, net

Since the appearance of the previous edition the medical world has had to deplore the death of Professor Cushny. His services to medicine were both many and important. He it was who worked out the mode of action of digitalis on the heart, his collaboration with Sir James Mackenzie formed the basis of much of the work of Sir Thomas Lewis and others. The "modern theory" of renal secretion we owe to Cushny—it is not too much to say that he was the founder of modern pharmacology. Certainly he was the outstanding figure of his profession—an *original* worker, a blazer of trails.

Revision of this noted work, fortunately, has been placed in excellent and capable hands. Professors Edmunds and Gunn have brought the work into line with the U. S. P. (X) and thoroughly up-to-date throughout. Much new material will be found on Iodoxybenzoic Acid, Ephedrine, Hexylresorcinol, Insulin, Parathyroid hormone, Stovarsol, "Bayer 205," "Fourneau 309," Carbon Tetrachloride, Luminal, Vitamins, Ethylene, Bismuth in syphilis, etc.

GREEN'S Manual of

Pathology and Morbid Anatomy

New (14th)
Edition

Revised and Enlarged by

A. PINEY, M.D., M.R.C.P.

Research Pathologist, Cancer Hospital, London; Late Director of the Institute of Pathology, Charing Cross Hospital, London; Sometime Lecturer in Pathological Histology in the University of Birmingham

Large 12mo, 650 pages with 261 engravings and 8 colored plates. Cloth, \$7.50, net

The general features of the book that have led to fourteen editions have been retained. Throughout, such additions and modifications of previous views have been made as advances in knowledge required. The sections on nephritis and on surgical shock have been entirely rewritten and important changes introduced into the section dealing with animal parasites. Two new colored plates and numerous illustrations have been added which further increase the value of this well-known work not only to students but also to general practitioners.

Washington Square

LEA & FEBIGER

Philadelphia

Please send books checked ×: ☐ Park, \$9.00. ☐ Cushny, \$6.00. ☐ Green, \$7.50.

NAME ADDRESS

Marine Biological Laboratory

Woods Hole, Mass.

SUPPLY DEPARTMENT

Open the Entire
Year

Biological Supplies

For the classroom, museum or collector.
Look for the sign of the *Limulus*. As the *Limulus* represents the test of time, we feel from the business growth that our supplies have also stood the test of years.

Send for Catalogue

No. I. Zoological and Embryological material. Life Histories and Habitat Groups.
No. II. Botanical material.
No. III. Microscopic Slides.

Address all correspondence regarding material and catalogue to:
Supply Department

GEO. M. GRAY, Curator,
Woods Hole, Mass.




Theresa Seessel Research Fellowships

To promote original research in biological studies

YALE UNIVERSITY

A fellowship, yielding an income of \$1,500. Preference is given to candidates who have already obtained their Doctorate, and have demonstrated by their work fitness to carry on successfully original research of a high order. The holder must reside in New Haven during the college year, October to June. Applications should be made to the Dean of the Graduate School, New Haven, Conn., before March 1, 1929. They should be accompanied by reprints of scientific publications, letters of recommendation, and a statement of the particular problem which the candidate expects to investigate.



Hy-Speed Mixers

Clamp to any tank, operate from light circuit, mix all kinds of liquids. Also used for even temperature baths. Thousands in use.

All Sizes from 1/10 H. P. \$37.50 up

Write for circular.
ALSO ENGINEERING CO.
47 W. 63rd St., New York

PHONELESCOPE

and
UNDULAGRAPH
Formerly made at Gloucester, Mass., now supplied by
CAPITAL APPARATUS WORKS
Box 885, Washington, D. C.

SCIENTIFIC PERIODICALS

Chemical, Medical and allied subjects. Complete files, volumes and copies, bought and sold. Kindly send us a list of your wants and items of which you may wish to dispose.

B. LOGIN & SON

29 East 21st Street

New York, N. Y.

CHARLES SCRIBNER'S SONS

NEW YORK LONDON

Henry Fairfield Osborn

Biological Series (1894-1928)

I. FROM THE GREEKS TO DARWIN

New and completely revised edition of this standard work. 12mo. 3d thousand. Ready in 1929. \$2.50

II. IMPRESSIONS OF GREAT NATURALISTS

Sequel to Vol. I. Darwin, Wallace, Huxley, Balfour, Bryce, Pasteur, Leidy, Cope, Butler, Burroughs, Muir, Roosevelt. With portraits. 12mo. 4th thousand. \$2.50

III. EVOLUTION AND RELIGION IN EDUCATION

Discussion with Bryan and other Fundamentalists of the years 1922-25. 12mo. 12th thousand. \$2.00

IV. CREATIVE EDUCATION

in School, College, University, and Museum

Fifty years' observation and experience in school, college, and university education and the training of biologists and geologists. "I rejoice that you have put your ripe experience into this brilliant book. It is tonic."—WILLIAM McANDREW. With portraits. 12mo. \$2.50

Life History of Earth and Man Series (1907-1928)

I. THE ORIGIN AND EVOLUTION OF LIFE

On the theory of action, reaction, and interaction of energy. Profusely illustrated. 8vo. 12th thousand. \$4.00

II. THE AGE OF MAMMALS

New and revised edition in preparation. Profusely illustrated. 8vo. \$6.00

III. EVOLUTION OF MAMMALIAN MOLAR TEETH

Foundation of the tributercular theory of human mammalian dentition up to the year 1907 (followed by W. K. Gregory's volume, "Origin and Evolution of the Human Dentition," of 1922). Profusely illustrated. 8vo. \$2.75

IV. MEN OF THE OLD STONE AGE

Their Environment, Life, and Art

Standard work in human archaeology. Profusely illustrated. Cr. 8vo. 20th thousand. \$5.00

Princeton University Press

V. MAN RISES TO PARNASSUS

Intellectual and spiritual evolution of man to close of New Stone Age. Sequel to Vol IV. Illustrated. 8vo. 3d thousand. \$2.50

A Scientific and Educational Book Service

THE SCIENCE PRESS DISTRIBUTING COMPANY is prepared to supply any book or any journal published in any country at as low a cost as it can be obtained. This agency has been established especially for the convenience of men and women working in science and education and for institutional libraries to whom we can offer unexcelled service. Orders for publications of a general character, however, will also be filled.

☞ ☞ ☞ ☞

RECENT FOREIGN BOOKS

MATHEMATICS

Lehrbuch der Algebra, verf. mit Benutzung von Heinrich Webers gleichnam. Buche. ROBERT FRICKE. Volume III: Algebraische Zahlen. 506 pp. 41 figures. \$5.40.

Lebendige Mathematik. Eine allgemeinverst. Einführung. FELIX AUERBACH. 355 pp. Illustrated. \$2.40.

Einleitung in die Mengenlehre. ADOLF FRAENKEL. Third edition. 424 pp. 13 illustrations. (*Die Grundlehren d. mathematischen Wissenschaften. Volume IX.*)

Warscheinlichkeitsrechnung und ihre Anwendung auf Fehlerausgleichung. Statistik und Lebensversicherung. EMANUEL CZUBER. Volume II. *Mathemat. Statistik. Mathemat. Grundlagen d. Lebensversicherung.* Third edition. 470 pp. 34 figures. \$4.18.

Les Espaces abstraits et leur théorie considérée comme introduction à l'analyse générale. MAURICE FRÉCHET. 296 pp. Paper bound. \$2.00.

Leçons sur les nombres transfinis. W. SIERPINSKI. 240 pp. Paper bound. \$2.00.

Leçons sur quelques équations fonctionnelles avec des application à divers problèmes d'analyse et de physique mathématique. EMILE PICARD. 184 pp. Paper bound. \$2.00.

Leçons sur les fonctions de variables réelles et les développements en séries de polynômes. EMILE BOREL. 158 pp. Paper bound. \$1.25.

PHYSICS

Lehrbuch der Physik. E. RIECKE. Edited by Ernst Lecher and Adolf Smekal. Seventh edition. Volume II: *Magnetismus und Elektrizität. Atomphysik.* 725 pp. Illustrated. \$4.08.

Lehrbuch der Physik in elementarer Darstellung. ARNOLD BERLINER. Fourth edition. 658 pp. 802 illustrations. \$4.76.

Physik. Ein Lehrbuch für Studenten an den Universitäten und Technischen Hochschulen. WILHELM H. WESTPHAL. 536 pp. 471 illustrations. \$4.71.

Lehrbuch der Kristallphysik mit Ausschluss der Kristalloptik. WOLDEMAR VOIGT. Reprint of first edition with additions by the author and preface by LAUE. 978 pp. 213 figures. 1 plate. \$9.84.

Lehrbuch der Optik. KARL FÖRSTERLING. 610 pp. 193 illustrations. \$9.60.

Handbuch der Physik. Edited by HANS GEIGER and KARL SCHEEL. Volume VI: *Mechanik der elastischen Körper.* 632 pp. 290 illustrations. \$14.07.

Phosphoreszenz und Fluoreszenz. PHILIPP LENARD, FERDINAND SCHMIDT and RUDOLF TOMASCHECK. **Lichtelektrische Wirkung.** PHILIPP LENARD and AUGUST BECKER. pp. 745-1544. 52 illustrations. (*Handbuch d. Experimentalphysik. Volume XXIII, 2.*) \$17.28.

Lichtelektrische Erscheinungen. BERNHARD GUDDEN. 325 pp. 127 illustrations. (*Struktur d. Materie in Einzeldarstellung. VIII.*) \$6.05.

Elektronen-Röhren. HEINRICH BARKHAUSEN. Volume II: *Röhrensender. (Der Leistungsumsatz. Die Selbsterregung.)* Third edition. 121 pp. 69 illustrations. \$1.44.

Vier Vorlesungen über Wellenmechanik, geh. an d. Royal Institution in London im März 1928. EDWIN SCHRÖDINGER. 57 pp. 3 illustrations. Paper bound. \$1.00.

Chez les Atomes. RAYMOND LEREDU. 74 pp. Lille 1928. Paper bound. 50c.

AERONAUTICS

Das Flugwesen im In- und Ausland. Ein kurzer Überblick der Entwicklung des Flugwesens in allen Kulturstaaten. TH. CAMMANN. 250 pp. Illustrated. 90c.

Berichte der aeromechanischen Versuchsanstalt in Wien. Edited by RICHARD KATZMAYR. Volume I, part 1. 76 pp. 74 illustrations. Paper bound. \$2.40.

Handbuch für Flugzeugführer. Edited by HANS GEORG BADER. 193 pp. 91 illustrations. 7 tables. \$2.88.

Raketenfahrt. MAX VALIER. Fifth edition of "Vorstoß in den Weltenraum." 252 pp. Illustrated. Paper bound. \$2.05.

THE SCIENCE PRESS DISTRIBUTING COMPANY

GRAND CENTRAL TERMINAL, NEW YORK, N. Y.