Annual Book Issue

SCIENCE

25 April 1958

Volume 127, Number 3304

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By ARNE ENGSTRÖM, Karolinska Institutet, Stockholm, Sweden and J. B. FINEAN, The Medical School, University of Birmingham, England February 1958, 326 pp., illus., \$8.00

CONTENTS: From Microscopic Morphology to Molecular Structure. Methods in Ultrastructural Research. The Principles of Molecular Structure. The Role of Proteins. The Role of Lipids. The Role of Carbohydrates. Role of Nucleic Acids. Role of Mineral Salts. The Role of Ultrastructure in Biology and Medicine. AUTHOR INDEX—SUBJECT INDEX.

BIOCHEMICAL CYTOLOGY

By JEAN BRACHET, Université Libre de Bruxelles, Belgique

1957, 516 pp., illus., \$8.80

CONTENTS: Introduction: The Recent History of Biochemical Cytology. Brief Survey of the Techniques. The Cytoplasm of the Resting Cell. The Nucleus of the Resting Cell. Mitosis. Nucleic Acids in Heredity and Protein Synthesis. Nucleocytoplasmic Interactions in Unicellular Organisms. The Nucleus and the Cytoplasm in Embryonic Differentiation. Remarks on Cancer Cells. Final Remarks. SUBJECT INDEX.

INTRODUCTION TO ENZYMOLOGY

By ALAN H. MEHLER, National Institutes of Health, Bethesda, Maryland

1957, 425 pp., illus., \$10.80

CONTENTS: Introduction. Hydrolysis of Peptides and Proteins. Fermentation and Oxidation of Major Metabolic Fuels. Biological Oxidation: Transfer of Oxygen, Hydrogen, and Electrons. Sugars and Sugar Derivatives. Polynucleotides and Their Components. Amino Acids. Acids and Acid Derivatives. Organization of Structure and Function. SUBJECT INDEX.

QUANTUM MECHANICS OF ONE- AND TWO-ELECTRON ATOMS

By HANS A. BETHE and EDWIN E. SALPETER, Cornell University

(Reprinted from the Encyclopedia of Physics, Volume 35) February 1958, 369 pp., illus., \$10.00

CONTENTS: Introduction. The Hydrogen Atom Without External Fields. The Helium Atom without External Fields. Atoms in External Fields. Interaction with Radiation. Appendix on Spherical Harmonics. Bibliography. Addenda and Errata. AUTHOR INDEX—SUBJECT INDEX. INDEX OF TABLES.

CHOLESTEROL

Chemistry, Biochemistry, and Pathology

Edited by ROBERT P. COOK, Queen's College, University of St. Andrews, Dundee, Scotland June 1958, about 530 pp., illus., approx. \$15.00 Contributions by D. Adlersberg, W. Bergmann, P. Bladon, G. H. Bourne, G. S. Boyd, R. P. Cook, H. Dam, R. G. Gould, O. Hechter, Marjorie G. Horning, M. F. Oliver, I. H. Page, J. B. M. Rattray, H. Sobotka, and Thressa C. Stadtman.

BIOPHYSICAL CHEMISTRY

By JOHN T. EDSALL, Harvard University and JEFFRIES WYMAN, UNESCO, Cairo, Egypt Volume 1:

Thermodynamics, Electrostatics, and the Biological Significance of the Properties of Matter January 1958, 699 pp., illus., \$14.00

CONTENTS: Biochemistry and Geochemistry. Water and Its Biological Significance. Problems of Protein Structure. Thermodynamics. Electrostatics: Its Application to Polar Molecules and Ionic Solutions. Dielectric Constants and Their Significance. Conductivity of Electrolytes. Acid-Base Equilibria. Polybasic Acids, Bases, and Ampholytes, Including Proteins. Carbon Dioxide and Carbonic Acid. Some General Aspects of Molecular Interactions. AUTHOR INDEX—SUBJECT INDEX.

Volume 2, in preparation:

Physical Chemistry of Macromolecules and of Blood

QUANTUM CHEMISTRY An Introduction

By WALTER KAUZMANN, Princeton University 1957, 744 pp., illus., \$12.00

CONTENTS: Introduction. Mathematical Background. General Principles of Quantum Mechanics. Atomic Systems. Molecular Systems. Systems in Non-Stationary States. Appendixes. SUBJECT INDEX. *REVIEW*: "The mathematical introduction, written at a level well within the grasp of most chemists, is outstanding. . . . The reviewer ventures to predict that the text will be widely adopted."

-Journal of the American Chemical Society

BIOCHEMISTRY OF THE AMINO ACIDS

By ALTON MEISTER, Tufts University School of Medicine, Boston, Massachusetts

1957, 485 pp., illus., \$10.00

CONTENTS: The Natural Amino Acids. The Role of Amino Acids in Nutrition. General Biochemical and Physiological Considerations. Intermediary Metabolism of the Amino Acids. Abnormalities of Amino Acid Metabolism in Certain Pathological Conditions. AUTHOR INDEX—SUBJECT INDEX.

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The Taylor Series. An introduction to the theory of functions of a complex variable. P. Dienes. Dover, New York, 1957 (unabridged and unaltered ed. 1 with errata incorporated in the text). 562 pp. Paper, \$2.75.

Safety Techniques for Radioactive Tracers. J. C. Boursnell. Cambridge University Press, New York, 1958. \$1.75.

Radioisotopes. A new tool for industry. Sidney Jefferson. Philosophical Library, New York, 1958. 118 pp. \$4.75.

The Philosophy of Humanism. Corliss Lamont. Philosophical Library, New York, ed. 4, 1958. 254 pp. \$2.75.

Methods in Medical Research. vol. 7. James V. Warren, Ed. Year Book, Chicago. 237 pp. \$7.50.

Index of Books Reviewed in SCIENCE, 26 April 1957 through 18 April 1958

Astronomy

Astronomical Optics and Related Subjects, Z. Kopal, Ed. (North-Holland; Interscience), 29 Nov. 1957, 1122

Galactic Nebulae and Interstellar Matter, J. Dufay (Philosophical Library), 20 Sept. 1957, 565

The Galactic Novae, C. Payne-Gaposchkin (North-Holland; Interscience), 27 Dec. 1957, 1350

The Making of a Moon, A. C. Clarke (Harper), 22 Nov. 1957, 1070

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The Milky Way, B. J. Bok and P. F. Bok, ed. 3 (Harvard Univ. Press), 26 Apr. 1957, 829

Morphological Astronomy, F. Zwicky (Springer), 14 Feb. 1958, 343

Radioastronomie, R. Coutrez (Observatoire Royal de Belgique), 17 Jan. 1958, 153

The Stars Above Us, E. Zinner (Scribner's), 31 Jan. 1958, 243

The Sun, G. Abetti (Macmillan), 26 Apr. 1957, 828

Biochemistry and Microbiology

Advances in Enzymology and Related Subjects of Biochemistry, vol. 18, F. F. Nord, Ed. (Interscience), 15 Nov. 1957, 1023

Biochemical Individuality, R. J. Williams (Wiley; Chapman & Hall), 10 May 1957, 940

Biochemical Problems of Lipids, G. Popják and E. Le Breton, Eds. (Interscience), 13 Sept. 1957, 515

Biochemistry and Human Metabolism, B. S. Walker, W. C. Boyd, I. Asimov (Williams & Wilkins), 21 Mar. 1958, 641

The Biochemistry of Vitamin B₁₂, R. T. Williams, Ed. (Cambridge Univ. Press), 31 May 1957, 1094

Bioenergetics, A. Szent-Györgyi (Academic Press), 27 Sept. 1957, 615

Colorimetric Analysis, vol. I, N. L. Allport and J. W. Keyser (Chapman & Hall), 10 Jan. 1958, 89

Dictionary of Microbiology, M. B. Jacobs, M. J. Geestein, W. G. Walter (Van Nostrand), 25 Oct. 1957, 847

The Life of Bacteria, K. V. Thimann (Macmillan), 6 Sept. 1957, 455

Methods of Biochemical Analysis, vol. 4, D. Glick, Ed. (Interscience), 30 Aug. 1957, 407

Methods in Enzymology, vol. 3, S. P. Colowick and N. O. Kaplan (Academic Press), 21 June 1957, 1251

Plant Virus Serology, R. E. F. Matthews (Cambridge Univ. Press), 27 Sept. 1957, 616

Recent Progress in Hormone Research, vol. 13, G. Pincus, Ed. (Academic Press), 14 Feb. 1958, 344

Some Principles of Energetics in Biochemical Reactions, I. M. Klotz (Academic Press), 23 Aug. 1957, 364

Synthetic Polypeptides, C. H. Bamford, A. Elliott, W. E. Hanby (Academic Press), 26 July 1957, 172

Trophoblastic Growths, J. Smalbraak (Elsevier), 14 Mar. 1958, 597

Ultrastructure and Cellular Chemistry of Neural Tissue, H. Waelsch, Ed. (Hoeber-Harper), 24 Jan. 1958, 195

Biological Sciences

Actions Chimiques et Biologiques des Radiations, vol. 2, M. Haissinsky, Ed. (Masson), 6 Sept. 1957, 455

Advances in Genetics, vol. VIII, M. Demerec, Ed. (Academic Press), 10 May 1957, 941

Biogeography, P. Dansereau (Ronald Press), 23 Aug. 1957, 361

Craig and Faust's Clinical Parasitology, E. C. Faust, P. F. Russell, D. R. Lincicome (Lea & Febiger), 20 Dec. 1957, 1297



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Development of Vertebrates, E. Witschi (Saunders), 27 Sept. 1957, 616

Die Evolution der Organismen, pts. 4 and 5, G. Heberer, Ed. (Fischer), 24 Jan. 1958, 193

General Genetics, M. J. Sirks (Nijhoff, The Hague), 31 May 1957, 1095

The Genus Achlya: Morphology and Taxonomy, vol. 20, T. W. Johnson, Jr. (Univ. of Michigan Press; Oxford Univ. Press), 27 Sept. 1957, 616

The Great Chain of Life, J. W. Krutch (Houghton Mifflin), 21 June 1957, 1250 International Review of Catalogy vol

International Review of Cytology, vol. 6, G. H. Bourne and J. F. Danielli, Eds. (Academic Press), 18 Apr. 1958, 869 Isotopic Tracers in Biology, M. D. Kamen (Academic), 18 Oct. 1957, 754

The Liassic Therapsid Oligokyphus, W. G. Kühne (British Museum of Natural History), 13 Dec. 1957, 1250

The Life and Death of Cells, J. G. Hoffman (Hanover House), 26 July 1957, 171

Medical Radiation Biology, F. Ellinger (Thomas; Blackwell; Ryerson), 7 Mar. 1958, 523

Mitochondria and Other Cytoplasmic Inclusions, No. 10, (Academic Press), 11 Oct. 1957, 705

Natürliche und Künstliche Erbänderungen, H. Marquardt (Rohwolt), 28 Mar. 1958, 695

Notions de Cytologie et Histologie, M. Chèvremont (Desoer), 4 Oct. 1957, 657

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Physical Techniques in Biological Research, vol. 2, G. Oster and A. W. Pollister, Eds. (Academic Press), 2 Aug. 1957, 215

The Physiology of Reproduction in Fungi, L. E. Hawker (Cambridge Univ. Press), 3 Jan. 1958, 36

The Principles of Heredity, L. H. Snyder and P. R. David (Heath), 20 Sept. 1957, 567

The Reproductive Development of the Female, M. F. A. Montagu (Julian Press), 14 Mar. 1958, 597

The Species Problem, Ernst Mayr, Ed. (American Assoc. for the Advancement of Science), 31 Jan. 1958, 245

A Symposium on the Chemical Basis of Heredity, W. D. McElroy and B. Glass, Eds. (Johns Hopkins Press), 16 Aug. 1957, 313

Theoretical Genetics, R. B. Goldschmidt (Univ. of California Press), 26 Apr. 1957, 816

The Water Relations of Terrestrial Arthropods, E. B. Edney (Cambridge Univ. Press), 9 Aug. 1957, 265

Botanical Sciences

Bibliography of Plant Protection, 1946-1947, J. Barner (Biologische Bundesanstalt, Berlin), 22 Nov. 1957, 1071

Botany, W. W. Robbins, T. E. Weier, C. R. Stocking (Wiley; Chapman & Hall), 2 Aug. 1957, 214

An Encyclopedia of Annual and Biennial Garden Plants, C. O. Booth (Faber & Faber), 24 Jan. 1958, 194

Die Gattungen der Rhodophyceen, H. Kylin (Gleerup, Lund, Sweden), 3 May 1957, 890

A Glossary of Mycology, W. H. Snell and E. A. Dick (Harvard Univ. Press), 26 July 1957, 173

A Manual of Soil Fungi, J. C. Gilman (Iowa State College Press), 26 July 1957, 173

Marine Algae of the Northeastern Coast of North America, W. R. Taylor (Univ. of Michigan Press), 30 Aug. 1957, 409

Mosses of Indiana, W. H. Welch (Bookwalter), 20 Dec. 1957, 1298

Principles of Fungicidal Action, J. Horsfall (Chronica Botanica), 10 May 1957, 941

Principles of Plant Pathology, E. C. Stakman and J. G. Harrar (Ronald Press), 17 Jan. 1958, 151

The Study of Plant Communities, H. J. Oosting (Freeman), 26 July 1957, 174

Chemistry

Vapour Phase Chromatography, D. H. Desty, Ed. (Academic Press; Butterworths), 16 Aug. 1957, 311

Advances in Chemical Engineering, T. B. Drew and J. W. Hoopes, Jr. (Academic Press), 26 Apr. 1957, 827

Advances in Pest Control Research, vol. 1, R. L. Metcalf, Ed. (Interscience), 4 Apr. 1958, 752

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Chemical Engineering in the U.S.A., P. H. Calderbank (Her Majesty's Stationery Office), 21 June 1957, 1251

Chemistry of Chromium and Its Compounds, M. J. Udy, Ed. (Reinhold; Chapman & Hall), 3 May 1957, 891 Chemistry Creates a New World, B.

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The Chemistry of Organometallic Compounds, E. G. Rochow, D. T. Hurd, R. N. Lewis (Wiley; Chapman & Hall), 24 Jan. 1958, 194

The Chemistry of Plants, E. V. Miller (Reinhold; Chapman & Hall), 21 Mar. 1958, 641

La Chimie Nucléaire et Ses Applications, M. Haïssinsky (Masson), 7 Feb. 1958, 291

Comprehensive Inorganic Chemistry, vol. 6, J. F. Suttle and R. C. Brasted (Van Nostrand), 31 Jan. 1958, 245

The Encyclopedia of Chemistry, G. L. Clark, Ed. (Reinhold; Chapman & Hall), 26 Apr. 1957, 826

Excited States in Chemistry and Biology, C. Reid (Academic Press; Butterworths), 15 Nov. 1957, 1021

Fusion Methods in Chemical Microscopy, W. C. McCrone, Jr. (Interscience), 24 May 1957, 1045

Gas Chromatography, A. I. M. Keulemans (Reinhold), 4 Oct. 1957, 656

Gas Dynamics, K. Oswatitsch (Academic Press), 10 Jan. 1958, 89

Gmelins Handbuch der Anorganischen Chemie, System No. 28, Calcium, pt. A, sec. 2; System No. 32, Zinc; System No. 68, Platinum, pt. D; E. H. E. Pietsch, Ed. (Verlag Chemie), 22 Nov. 1957, 1071

A Guide to the Literature of Chemistry, E. J. Crane, A. M. Patterson, E. B. Marr (Wiley; Chapman & Hall) 19 July 1957, 127

Heterocyclic Compounds, R. C. Elderfield, Ed., vol. 5 (Wiley; Chapman & Hall), 14 June 1957, 1206; vol. 6 (Wiley), 5 July 1957, 33

Molecules and Crystals in Inorganic Chemistry, A. E. Van Arkel (Interscience; Butterworths), 23 Aug. 1957, 360

Organic Analysis, vol. 3, J. Mitchell, Jr., I. M. Kolthoff, E. S. Proskauer, A. Weissberger, Eds. (Interscience), 31 May 1957, 1095

Organic Synthesis, vols. 1 and 2, V. Migrdichian (Reinhold; Chapman & Hall), 13 Sept. 1957, 513

Oxine and Its Derivatives, vols. 1-4, R. G. W. Hollingshead (Butterworths), 18 Apr. 1958, 869

Phenazines, G. A. Swan and D. G. I. Felton (Interscience), 11 Apr. 1958, 809

pH Measurements, Their Theory and Practice, V. Gold (Methuen; Wiley), 5 July 1957, 33

Progress in the Chemistry of Organic Natural Products, vol. 13, L. Zechmeister, Ed. (Springer), 9 Aug. 1957, 269

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63-01 Metropolitan Avenue Middle Village 79, N.Y. Quantum Chemistry, an Introduction, W. Kauzmann (Academic Press), 13 Sept. 1957, 515

Quelques Problèmes de Chimie Minérale, R. Stoops, Ed. (Institut International de Chimie Solvay), 27 Dec. 1957, 1350

The Reactive Intermediates of Organic Chemistry, J. E. Leffler (Interscience), 17 May 1957, 995

Structure Reports for 1940-1941, vol. 8, A. J. C. Wilson, Ed. (Oosthoek), 14 June 1957, 1205

Synthetic Methods of Organic Chemistry, W. Theilheimer, Ed. (Karger; Interscience), 17 Jan. 1958, 152

Technique of Organic Chemistry (Interscience), vol. 3, pt. 1, Separation and Purification, A. Weissberger, 9 Aug. 1957, 267; vol. 10, Fundamentals of Chromatography, H. G. Cassidy, 6 Sept. 1957, 457

The Terpenes, vol. 4, Sir John Simonsen and W. C. J. Ross (Cambridge Univ. Press), 28 Feb. 1958, 478

Earth Sciences

Allgemeine Meereskunde, G. Dietrich and K. Kalle (Borntraeger, Berlin), 5 July 1957, 33

The American Oasis, E. Higbee (Knopf), 30 Aug. 1957, 407 Arizona's Meteorite

Arizona's Meteorite Crater, H. H. Nininger (American Meteorite Museum), 26 Apr. 1957, 829

The Climate near the Ground, R. Geiger (Harvard Univ. Press), 2 Aug. 1957, 214

Climatology, ed. 2, W. G. Kendrew (Oxford Univ. Press), 28 Mar. 1958, 695 Dahlak, E. Brockett, Ed. (Essential

Books), 26 Apr. 1957, 814 Dynamic Meteorology and Weather Forecasting, C. L. Godske, T. Bergeron,

J. Bjerknes, R. C. Bundgaard (American Meteorological Society and Carnegie Institution of Washington), 26 Apr. 1957, 829

L'Evolution de la Lithosphère: Orogénèse, vol. 3, H. Termier and G. Termier (Masson), 6 Dec. 1957, 1183

The Exploration of the Colorado River, J. W. Powell (Univ. of Chicago Press), 15 Nov. 1957, 1024

Geologic Field Methods, J. W. Low (Harper), 7 Feb. 1958, 291

Géologie Sédimentaire, A. Lombard (Masson; Vaillant-Carmanne), 10 Jan. 1958, 88

Glacial and Pleistocene Geology, R. F. Flint (Wiley; Chapman & Hall), 3 Jan. 1958, 33

Glossary of Geology and Related Sciences, J. V. Howell (American Geological Inst.), 13 Sept. 1957, 515

The Granite Controversy, H. H. Read (Interscience), 20 Sept. 1957, 566

Lectures on Rock Magnetism, P. M. S. Blackett (Weizmann Science Press of Israel), 23 Aug. 1957, 363

The North American Deserts, E. C. Jaeger (Stanford Univ. Press), 10 Jan. 1958, 90

1001 Questions Answered About the Weather, F. H. Forrester (Dodd, Mead), 28 Feb. 1958, 477

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Letters

On the Pay of Biologists

The announcement "Pay Up for Some Government Scientists" in a recent issue of *Science* [127, 21 (3 Jan. 1958)] states that biologists are not included in the pay increase. This seems to be an old and perennial problem among the biologists. I am reminded of the following note I came across this past summer while reading through some old correspondence of the naturalists (Hyatt, Packard, Putnam, and Morse) who founded the Peabody Museum of Salem, the *American Naturalist*, and the American Society of Naturalists.

Rochester, New York

May 18, 1870 I am well aware that works of scientific character are not remunerative, and regret that you have not received the money [subscription money sent to the American Naturalist, not properly credited]. Scientific men get much less for their services than any other class of workers. Audubon's great work on birds was a failure in a pecuniary point of view. Le Baliant, the great African traveler, died absolutely poor. I am informed our great American botanist Asa Gray gets the meager sum of fifteen hundred dollars a year for his valuable services. And many others might be mentioned of like character.

Sincerely yours, Robert Bunker

The biologist continues to be low man on the scientific totem pole.

RALPH W. DEXTER

Department of Biology, Kent State University, Kent, Ohio

Department of Science

In the editorial of the 31 January issue of *Science* [127, 213 (1958)], you question the effectiveness and usefulness of a Secretary of Science, and it seems to me that you prefer the idea of adding a science adviser to some Government departments. There may be a possibility of joining these two ideas: The Secretary of Science would appoint the science advisers for the different departments, so that no overlapping would occur. In this way the Secretary of Science would have a great responsibility and a very useful task.

But this is not all. There is no longer any value in having a combined Department of Health, Education, and Welfare. Each activity in itself is too great a task for the three to be handled together by one department. The best thing would be to separate the "Education" and to put it under the Secretary of Science. There are so many things to decide, to order, to explore, and to alter that this Department of Science would be fully occupied. There would be one office which could make decisions for the nation and for all levels of schools as well

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as for all types of schools. The curriculum of a school should no longer be determined by a local school-board or by school boards in certain states; this is a national matter, and there must be nationwide direction. All these supervisory activities must be handled uniformly, in one central place.

ROBERT LOBSTEIN Santa Monica, California

Actinomycetes

There has been, in recent years, a most unfortunate tendency to publish names of presumably new species of microorganisms, notably actinomycetes, without accompanying such names by proper descriptions. This tendency has been greatly aggravated by the growing interest in describing or in patenting new antibiotics, where a new name for an organism producing such an antibiotic might carry additional weight for priority for independent discovery, or for patentability. Enough problems are raised when names of organisms are published with insufficient descriptions; these difficulties are compounded when no descriptions are given at all. Often a new name is announced, accompanied by one of the following statements:

"This organism appears to be different from those reported in the literature."

"This organism proved to be a hitherto undescribed actinomycete and is named _____""

"Since the characteristics of this organism were not in accordance with those of any of the *Streptomyces* listed in Bergey's *Manual of Determinative Bacteriology*, it was given the name

Sometimes no evidence is presented that a thorough search of the literature has been made, and frequently the new name is not even accompanied by a rudimentary description.

This practice of creating new species, not accompanied by valid descriptions, is to be thoroughly condemned. It violates both the botanical and bacterial codes of nomenclature. It is thoroughly unscientific.

I would like to recommend, therefore, that journals refrain from accepting papers for publication in which new species are listed without accompanying descriptions of the organisms or without references to prior publications of such descriptions.

Incidentally, while I am on the subject of scientific usage, attention should be called to the fact that many scientific journals have adopted the practice of avoiding the use of trade names for antibiotics in scientific papers but insist upon the proper use of scientific names in such papers. Thus, the name "chloramphenicol" is used in scientific litera-

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ture and not the trade name "Chloromycetin"; "chlortetracycline" and not "Aureomycin"; "oxytetracycline" and not "Terramycin"; "neomycin" and not "Mycifradin"; and so on.

SELMAN A. WAKSMAN Institute of Microbiology, Rutgers University, New Brunswick, New Jersey

"If You Ples"

With *waitresses* you're most correct; You manage *businesses* with ease;

Your weaknesses we all respect-But why on earth say processes?

But why on earth say processe

This current quirk in pronunciation might be brought to the attention of English-speaking scientists before the habit becomes too engrained.

RALPH A. LEWIN

Marine Biological Laboratory, Woods Hole, Massachusetts

Science and Religion

In his recent article, "Science and the citizen" [Science 126, 1225 (1957)], Warren Weaver makes the following statement: "I would suggest that an absolutely critical distinction between science and religion may be that science never will and never can actually reach the final goal of perfection, whereas religion can do so and has done so." No true scientist will disagree with the statement that science can never achieve perfection. The essence of science is the capacity for objective self-criticism and the realization that today's concepts must constantly be revised in the light of new knowledge.

But has religion achieved perfection? Assuming that the morals and ethics of human society are related to the practice of religion, can we claim "perfection" in this area? If so, why are we so concerned today about crime, social injustice, and world peace?

Religion, like science and all other human activities, undergoes change-it evolves. Julian Huxley, in Man in the Modern World (1948), traces the evolution of religion from primitive man's attempts to explain and abate the forces of nature, through polytheism, to monotheism. He concludes that the ultimate stage in this evolution will be a religion that is largely "a deep concern for the welfare of one's fellow man with God absent or merely in the background." Whether we like it or not, the principal religions of the world are steadily moving toward liberalism and humanism, and away from fundamentalism. For example, a survey of the religious beliefs of prominent scientists in the United States [H. J. Leuba, *The Belief in God* and *Immortality* (1916)] showed that only 21 percent believed in a personal God—that is, a God capable of interceding in the affairs of man.

How can anything that is changing and evolving be considered to be "perfected"? Is any human activity "perfect"? But suppose we concede that at some time and place in the world there was (or is) a "perfect" religion. Where does this concept lead? It means that the "perfect" object must be defended against all change, because any change is bad-it is away from perfection. We force ourselves into a position of defending the status quo at all costs. Further investigation, discussion, or criticism must be prevented because they lead not to improvement but to "heresy." This is the doctrine of infallibility based on authority. To such a model of "perfection" science is a real threat. The methods of science depend on the light of unbiased new truth, a devotion to self-criticism, and a capacity for change.

As Dr. Weaver points out, the layman is often concerned about the so-called conflict between science and religion. Einstein, in his essay on "Science and Religion" [Out of My Later Years (1941)], discusses the source of this historical conflict. It occurs chiefly in the area of interpretation of natural phenomena. According to Einstein, religion is incapable of establishing the causeand-effect relationships of physical occurrences in nature, but its insistence on doing so has led to innumerable conflicts in the past, most notably the clashes that arose with the discoveries of Copernicus, Galileo, and Darwin. He further states that "the doctrine of a personal God interfering with natural events could never be refuted, in a real sense, by science, for this doctrine can always take refuge in those domains in which scientific knowledge has not yet been able to set foot. A doctrine which is able to maintain itself not in clear light but only in the dark, will of necessity lose its effect on mankind with incalculable harm to human progress."

How does this doctrine of "perfection" in religion affect the layman's understanding of science and religion? It requires the conviction that, in any conflict between science and religion, religion is right and science is wrong. It undermines confidence in the objective methods of science and in the validity of its accomplishments. The layman is apt to regard lack of agreement among scientists as a sign of weakness rather than as a source of strength. But, most of all, the layman is likely to mistake the enforced conformity of authoritarian religions for evidence of Truth.

One of the vital problems of the modern world is that progress in the social and political sciences has not kept pace



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Science is incompatible with authoritarian claims to "perfection" by religionists, or political systems, or other groups. However, science is not a threat to an objective, liberal religion. Science and religion must work together toward the goal of humanism—a deep concern for the welfare of mankind here and now. CLAUDE H. HILLS

Flourtown, Pennsylvania

Warren Weaver's valuable article "Science and the citizen" [Science 126, 1225 (1957)] was unfortunately marred, it seems to me, by the desire to show some deference to religion. The belief of the "average citizen" that "science has destroyed the element of faith in religion" is surely closer to the mark than the assertion that "science is itself founded on faith." In this context, the term *faith* merely begs the question. What is this "faith" on which science is founded? I would suggest that it takes two forms: in experimental science, the appeal to experiment and observation as the court of last resort; in mathematics and logic, the appeal to reason as the court of last resort. Certain esthetic considerations, which are difficult to characterize briefly, also exert their influence.

Neither form of "faith" attaches the slightest importance, except as a matter of convenience, to the weight of tradition and authority. As a consequence, neither is compatible with any form of revealed religion.

ERWIN KLINGSBERG Mountainside, New Jersey

I am most gratified that Claude H. Hills, Erwin Klingsberg, and several other correspondents have been interested in the highly condensed (and thus necessarily unsatisfactory) references which I made to religion in the paper "Science and the citizen." In response to these comments I have been writing out a fuller statement of my views on the points involved. Unfortunately I cannot meet the requirement of the editor of *Science* that the answer to a question contain no more words than the question does. My reply will be published before long in another journal, and perhaps, when this occurs, the editor will insert a brief notice and reference.

WARREN WEAVER New York, New York

Meetings

American Astronautical Society

The American Astronautical Society, founded in 1953 and incorporated in New York State in 1954, is a scientific organization dedicated to advancement of the astronautical sciences. The society considers manned interplanetary space flight a logical progression from today's high-performance research plane, guided missile, and earth satellite operations. The scope of the society is indicated by a partial list of the astronautic fields of interest: astronavigation, biochemistry, celestial mechanics, cosmology, geophysics, and space medicine, as well as space vehicle design, including communications, control, guidance, and propulsion.

Promotion of astronautics is accomplished by the society largely through its program of technical meetings and publications. The fourth annual meeting, held in New York City 29 to 31 January, was attended by over 600 members and guests. Forty-five original papers were presented, in technical sessions on "Space vehicle design," "Space explora-tion," "Guidance and control," "Man's environment in space," "Space vehicle communications," and "Astronautics research." At the Honors Night dinner, presentations were made to recipients of the AAS Space Flight award, the Melbourne W. Boynton award for space medicine, and the Annual Fellow awards. Plans are currently being formulated to hold the fifth annual meeting in Washington, D.C., at the end of December, in conjunction with the annual meeting of the AAAS. In addition, a West Coast regional AAS meeting will be presented in San Francisco in August.

Regional sections of the American Astronautical Society have been formed in New York, San Francisco, and Washington, D.C. Technical meetings, dinners, and field trips are among the activities arranged by these sections. Considerable interest has been expressed by AAS members and others in the formation of new regional sections in Los Angeles, Baltimore, Dallas, Philadelphia, Dayton, Boston, and Chicago. It is expected that most of these groups will be chartered as AAS regional sections during 1958.

Publications of the society include the Journal of the Astronautical Sciences, Proceedings of the AAS annual meetings, and reprints of technical papers. At the present time the Journal is published quarterly and incorporates the "Astronautical Sciences Review." Ultimately, it is planned to publish the "Astronautical Sciences Review" separately as a companion magazine which would contain articles of general interest, AAS news, abstracts, book reviews, and so on.

Membership in the society is com-

posed primarily of scientists and engineers, although all persons having a sincere interest in astronautics, including students, are eligible for special grades of membership. Each year the board of directors and the fellows of the society elect as fellows those who have made direct and significant contributions to the astronautical sciences. At the present time, the roster of AAS members includes about 600 persons. Additional support of the society is sought from American industry. There are presently seven AAS corporate members: Varo Manufacturing Company; Avion Division-ACF Industries, Inc.; Douglas Aircraft Company; Republic Aviation Corporation; Space Corporation; Kearfott Company, Inc.; and the Martin Company.

The society cooperates fully with other national and international scientific organizations; it is a member of the International Astronautical Federation and an affiliate of the American Association for the Advancement of Science. Paul A. Campbell of the U.S. Air Force Office of Scientific Research has been appointed the 1958 representative on the AAAS council.

Ross Fleisig Sperry Gyroscope Company, Great Neck, New York

Chemical Organization of Cells

A Conference on the Chemical Organization of Cells, Normal and Abnormal, will be held in Madison, Wis., 21, 22, and 23 August. Participants will be specialists in anatomy, biochemistry, embryology, and pathology who will provide correlated recent information about the cell in a series of formal presentations. Inquiries should be addressed to: Dr. Joseph J. Lalich, Professor of Pathology, University of Wisconsin, Madison 6, Wis.

A limited number of travel stipends may become available later this spring. Information will be advertised in appropriate journals and circularized to those who have already registered with Dr. Lalich for the conference.

Physiological Sciences

The 21st International Congress of Physiological Sciences (physiology and pharmacology) will be held in Buenos Aires, Argentina, 9–15 August 1959. Bernardo A. Houssay will be the president. The Organizing Committee consists of E. Braun Menéndez, chairman; A. O. M. Stoppani, secretary; E. Strajman, treasurer; and M. H. Burgos, H. Chiodi, T. Combes, E. D. P. De Robertis, J. C. Fasciolo, V. G. Foglia, E. Hug, A. Lanari, L. F. Leloir, J. T. Lewis, R. E. Mancini, E. Moisset de Espanes, E. L. Rabasa, L. M. Rinaldini, These are the world's most widely used spectrophotometers



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Sensory Deprivation

A Symposium on Sensory Deprivation will take place in Boston, Mass., 20–21 June, under the joint auspices of the Psychiatric Research Laboratory, Boston City Hospital, Harvard University Medical School, and the Office of Naval Research (Physiological Psychology Section). The symposium will be a closed working meeting of invited speakers and discussants. Proceedings will be published. The planning committee consists of Philip Kubzansky, P. Herbert Leiderman, Jack H. Mendelson, Donald Wexler, and Philip Solomon (chairman).



Society Elections

• Econometric Society: pres., James Tobin, Department of Economics, Yale University; v. pres., M. Marcel Boiteux, Paris, France; sec., Richard Ruggles, Department of Economics, Yale University, New Haven, Conn.; treas., Nancy Ruggles, New Haven, Conn. The representative to the AAAS Council is Charles F. Roos, New York, N.Y.

•Western Society of Naturalists: pres., and representatives to the AAAS Council, Tracy I. Storer, University of California at Davis; past-pres., and representative to the AAAS Council, William M. Hiesey, Carnegie Institution of Washington, Stanford, Calif.; v. pres., Herbert L. Mason, Department of Botany, University of California, Berkeley; treas., Robert L. Fernald, Department of Zoology, University of Washington; sec., John P. Harville, Department of Biology, San Jose State College, San Jose 14, Calif.

• Ecological Society of America: pres., Stanley A. Cain, School of Natural Resources, University of Michigan; v. pres., Thomas Park, Hull Zoological Laboratory, University of Chicago; sec., John E. Cantlon, Department of Botany and Plant Pathology, Michigan State University, East Lansing, Mich.; treas., Jack S. Dendy, Department of Zoology and Entomology, Alabama Polytechnic Institute. The representatives to the AAAS Council are Henry J. Oosting and W. Frank Blair.

Florida Academy of Sciences: pres., Dan A. Thomas, Physics Department, Rollins College; pres.-elect, and representative to the AAAS Council, E. Ruffin Jones, Department of Biology, University of Florida; sec., Guenter Schwarz, Department of Physics, Florida State University, Tallahassee, Fla.; treas., Alex G. Smith, Department of Physics, University of Florida.

Forthcoming Events May

25-29. Air Pollution Control Assoc., 51st annual, Philadelphia, Pa. (H. M. Pier, APCA, 4400 Fifth Ave., Pittsburgh. 25-29. Institute of Food Technologists,

annual, Chicago, Ill. (C. S. Lawrence, IFT, 176 W. Adams St., Chicago 3.)

25-31. International Soc. of Gastroenterology, 3rd world cong., Washington, D.C. (H. M. Pollard, University Hospital, Ann Arbor, Mich.)

26-28. American Soc. for Quality Control, annual, Boston, Mass. (W. P. Youngclaus, Jr., ASQC, 161 W. Wisconsin Ave., Milwaukee 3, Wis.)

26-29. Comparative Endocrinology Symp., Cold Spring Harbor, N.Y. (Symposium of Comparative Endocrinology, Dept. of Zoology, Columbia Univ., New York 27.)



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27-31. Thermal and Hydraulic Power Stations, Liége, Belgium. (A. Biron, 1, rue de Spa, Liége.)

28-8. European Federation of Chemical Engineering, 2nd cong., Brussels, Belgium and Frankfurt/Main, Germany. (Deutsche Gesellschaft für Chemisches Apparatewesen, Rheingau-Allee 25, Frankfurt/Main.)

29-31. American Acad. of Dental Medicine, 12th annual, Montreal, Canada. (G. Witkin, AADM, 45 S. Broadway, Yonkers 2, N.Y.)

31-8. European Federation of Corrosion, 2nd cong., Frankfurt/Main, Ger-many. (Gesellschaft Deutscher Chemiker, Haus der Chemie, Karlstrasse 21, Frankfurt/Main.)

June

2-4. Telemetering Conf., 6th natl., Baltimore, Md. (G. M. Thynell, Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.)

2-5. American Nuclear Soc., 4th annual, Los Angeles, Calif. (ANS, P.O. Box 963, Oak Ridge, Tenn.)

2-6. Mass Spectrometry, 6th meeting, New Orleans, La. (R. A. Friedel, U.S. Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.)

2-6. Medical Library Assoc., 57th annual, Rochester, Minn. (T. E. Keys, Librarian, Mayo Clinic, Rochester.)

2-6. Peaceful Uses of Atomic Energy



in Australia, symp., Sydney, N.S.W. (Australian Atomic Energy Commission Research Establishment, Private Mail Bag, Sutherland, New South Wales.)

2-7. Mechanical Engineering, 7th internatl. cong., Scheveningen, Netherlands. (International Mechanical Engineering Cong., 10, avenue Hoche, Paris 8º.

3-5. Special Libraries Assoc., annual, Chicago, Ill. (M. E. Lucius, SLA, 31 E. 10 St., New York 3.)

4-14. Large Electric Systems, 17th intern. conf., Paris, France. (112, Boulevard Haussmann, Paris.)

5. Institute of Microbiology, 4th annual, New Brunswick, N.J. (E. R. Isaacs, Inst. of Microbiology, Rutgers Univ., New Brunswick.)

9-11. American Assoc. of Spectrographers, 9th annual symp., Chicago, Ill. (H. J. Hettel, Armour Research Foundation, 10 W. 35 St., Chicago 16.)

9-11. Canadian Federation of Biological Societies, 1st annual; with Canadian Assoc. of Anatomists, Canadian Biochemical Soc., Canadian Physiological Soc., and Pharmacological Soc. of Canada; Kingston, Ontario. (E. H. Bensley, Montreal General Hospital, 1650 Cedar Ave., Montreal 25, P.Q.)

9-11. Health Physics Soc., 3rd annual, Berkeley, Calif. (E. E. Anderson, Oak Ridge National Lab., Oak Ridge, Tenn.)

9-11. Soc. of General Physiologists, Woods Hole, Mass. (F. G. Sherman, Dept. of Biology, Brown Univ., Providence 12, R.I.)

9-11. Society for the Study of Development and Growth, 17th annual symp., South Hadley, Mass. (Miss K. Stein, Dept. of Zoology, Mount Holyoke College, South Hadley.)

9-12. Microscopy Symposium, 5th, Chicago, Ill. (W. C. McCrone, Jr., 500 E. 33 St., Chicago 16.)

9-13. Automation Exposition and Cong., 4th Internatl., New York. (International Automation Exposition, c/o Richard Rimbach Assoc., 845 Ridge Ave., Pittsburgh 12, Pa.)

10-12. Astronomical Soc. of the Pacific, annual, Los Angeles, Calif. (S. Einarsson, Leuschner Observatory, Univ. of California, Berkeley 4.)

10-13. Vacuum Techniques, 1st internatl. congress, Namur, Belgium. (E. Thomas, c/o CSN/ERM, 30, avenue de la Renaissance, Brussels 4, Belgium.)

11-14. Applied Mechanics, 3rd natl. Cong., Providence, R.I. (W. Prager, Brown Univ., Providence 12.)

11-14. National Soc. of Professional Engineers, St. Louis, Mo. (P. H. Robbins, NSPE, 2029 K St., NW, Washington, D.C.)

14-21. American Soc. of Medical Technologists, annual, Milwaukee, Wis. (Miss R. Matthaei, Suite 25, Hermann Professional Bldg., Houston 25, Tex.)

15-19. American Soc. of Mechanical Engineers, semiannual, Detroit, Mich. (O. B. Schier, II, ASME, 29 W. 39 St., New York 18.)

15-19. Cancer Research Conf., 3rd Canadian, Honey Harbour, Ontario. (R. L. Noble, Collip Medical Research Lab., Univ. of Western Ontario, London, Ont., Canada)

(See issue of 18 April for comprehensive list)

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