man of the new department, in addition to his former position. Dr. Simpson returned to the United States recently after two years of service in Military Intelligence in the North African, Sicilian and Italian areas. He is now on inactive service with the rank of Major, U. S. Army.

As reconstituted, the Department of Geology and Paleontology includes all divisions of earth sciences in the museum—mineralogy, general geology and various subdivisions of paleontology formerly scattered among the Departments of Invertebrates, Fishes, Amphibians and Reptiles, Birds and Mammals.

The official announcement reads:

In the new department, the structure and composition of the earth, its history, and the history of life on the earth will be treated in a unified manner. An understanding of present and probable future conditions of the earth's surface and of human, animal and plant life will be promoted by study including not only the succession and historical distribution of the different forms of life, but also the distribution and history of rocks, minerals and soils. Exploration in the field, research in the laboratory and exhibition in the museum's public halls will include a broad program of this sort, cutting across the lines of narrow specialization.

Within the department, emphasis will also be placed on evolutionary and biological studies of fossils. These studies cast the most important light on the origin and destiny of our present animals and of man by revealing where they came from, what their ancestors were like, and how and why they have changed and have migrated from continent to continent.

The collections of minerals and fossils, now united in the new department, are among the finest and largest in the world. Efforts will be made to make these even more fully useful and interesting to the public. There is also being developed a program of close cooperation in education and research with colleges and universities. The facilities and staff of the department will be used in conjunction with teaching and advanced study, and educational plans are being developed in coordination with several universities.

Assisting Dr. Simpson in the reorganization plans are Dr. Edwin C. Colbert, curator of fossil amphibians and reptiles, and Dr. Frederick H. Pough, curator of geology and minerals, both in charge of their respective subjects in the new department.

SCIENTIFIC NOTES AND NEWS

THE National Academy of Sciences has awarded the Daniel Giraud Elliot gold medal and certificate in recognition of outstanding publication in zoology or paleontology for 1938 to Professor Malcolm R. Irwin, University of Wisconsin; for 1939 to Professor John H. Northrop, Rockefeller Institute for Medical Research, and for 1940 to Professor William Berryman Scott, of Princeton University. The Mary Clark Thompson gold medal has been awarded for 1942 to Professor Edward W. Berry, of the Johns Hopkins University; for 1943 to Dr. George Gaylord Simpson, of the American Museum of Natural History, and for 1944 to Professor William J. Arkell, of the University of Oxford. The Ordnance Distinguished Service Award has been conferred on Major General G. M. Barnes, chief of the Research and Development Service, Office of the Chief of Ordnance, for distinguished work that has contributed greatly towards the commanding superiority in weapons and munitions now enjoyed by American forces in the field.

THE John Fritz Medal has been conferred on Dr. John L. Savage, chief designing engineer of the U. S. Bureau of Reclamation, Denver, Colo. The medal is awarded by a board composed of former presidents of the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers and the American Institute of Electrical Engineers.

DR. WALTER B. CANNON, professor emeritus of physiology of Harvard University, was re-elected president of the American-Soviet Medical Society at the first annual meeting of the society, which was held in New York City on November 11.

DR. THOMAS BARBOUR, professor of zoology and director of the Museum of Comparative Zoology at Harvard University, has been elected life-time honorary president of the American Society of Ichthyologists and Herpetologists.

HARVEY SEELEY MUDD, of Los Angeles, president and managing director of the Cyprus Mines Corporation, operating on the Island of Cyprus, has been elected president of the American Institute of Mining and Metallurgical Engineers. Vice-presidents elected were Donald H. McLaughlin, vice-president and general manager, Cerro de Pasco Copper Corporation, New York City, and Leo F. Reinartz, manager, Middletown Division, American Rolling Mill Company, Middletown, Ohio.

LAURENCE L. QUILL, professor of chemistry at the University of Kentucky and head of the department, has accepted a similar position at Michigan State College. On January 1 he will succeed A. J. Clark, head of the department since 1916, who retires with the title "distinguished professor."

DR. FRANK MENNE has resigned as professor of pathology and head of the department of the Medical

School of the University of Oregon. He is succeeded by Professor Warren C. Hunter, who has been a member of the faculty since 1925.

CAPTAIN ROBERT P. SHARP, of the Army Arctic Information Center, has been appointed associate professor of geology at the University of Minnesota, where he will have charge of the Division of Glaciology and Geomorphology. Captain Sharp is commissioned in the Air Corps, and at present is conducting field observations for the Army in the Arctic Northwest.

DR. F. P. ZSCHEILE, formerly associate professor of agricultural chemistry at Purdue University, has joined the staff of the department of botany at the University of Chicago.

DR. WARREN O. NELSON, professor and head of the department of anatomy of Wayne University, and Dr. Ralph G. James, assistant professor, have joined the faculty of the College of Medicine of the State University of Iowa.

DR. ROGER DENIO BAKER, associate professor of pathology in charge of surgical pathology at the School of Medicine of Duke University, has been appointed professor and chairman of the department of pathology in the Medical College at Birmingham of the University of Alabama. He expects to take up his new work on December 1.

GEORGE H. T. KIMBLE, of the British Naval Meteorological Service, formerly lecturer in geography at the University of Reading, has been appointed professor of geography and head of the newly established department of geography at McGill University.

THE chair of mathematics at the Royal Holloway College, London, vacant through the resignation of Professor Bevan Baker, has been filled by the appointment of Professor W. H. McCrea, who has been for some time in London, engaged in war work. Since 1936 Dr. McCrea has been professor of mathematics at Queen's University, Belfast.

DR. IRVINE H. PAGE, director of the Lilly Clinical Research Division, has resigned to accept appointment as director of the Cleveland Clinic. Dr. A. C. Corcoran and Robert D. Taylor, who have been associated with Dr. Page, have also resigned to continue their work at the Cleveland Clinic.

DR. ORPHEUS W. BARLOW, formerly director of the research laboratories of the Winthrop Chemical Company, has been appointed medical and research director of Nutrition Research Laboratories, Chicago.

HAROLD VAGTBORG, director of the Armour Research Foundation of the Illinois Institute of Technology, has been appointed president of the Midwest Research Institute. He plans to take up his work there on January 1. The Midwest Research Institute was organized as a nonprofit, scientific, research organization founded to develop agriculture, business, commerce, industry and the natural resources of the Middle West.

Industrial and Engineering Chemistry reports the appointment of Dr. Robert Emmett Burk, professor of chemistry at Western Reserve University, as special assistant to the plastics chemical director of E. I. du Pont de Nemours and Company.

DR. WILLIAM J. KIRKPATRICK and Dr. Nicholas T. Farinacci have resigned from the research staffs of the Hercules Powder Company and the Chemical Construction Company, respectively. They are continuing their activities with a group of associates as scientific and technical consultants under the name of Scien-Tech.

A GRANT to the University of Cincinnati of $50,000 has been made by Swift and Company, Chicago, for a protein study, to be carried on at Hillman Hospital, Birmingham, Ala., under the direction of Dr. Tom D. Spies, associate professor of medicine at the College of Medicine of the university. The grant will augment the general study in nutritional diseases that Dr. Spies has conducted since 1936.

PROFESSOR KNOWLES A. RYERSON, assistant dean of the College of Agriculture at Davis of the University of California, after a year's absence has returned to the United States and is expected to resume his work at the university on about December 1. At the request of the Government he undertook to supervise the production of food for the armed forces in the South Pacific area; later he was moved to the central Pacific. Having established production in these places, and arranged for continuation of the work, he has been relieved of further duties.

DR. DONALD E. FREAR, professor of agricultural biochemistry at the Pennsylvania State College, is serving as civilian consultant on the chemistry of insecticides and fungicides to the Committee on Medical Sciences of the Office of Scientific Research and Development.

PROFESSOR RODERICK PEATTIE, of the department of geography of the Ohio State University, arrived recently in Johannesburg, where he is head of the Office of War Information in the Union of South Africa. During his absence, Professor Helmut de Terra, head of the research section of the United States Board of Geographic Names, has joined the staff of the department. Previously he was associate professor of geography at the University of Maryland, and associate of the Carnegie Institution of Washington and of Yale University.

DR. A. J. LIEBMANN, director of the Schenley Research Institute at Lawrenceburg, Ind., gave on November 14 the first lecture of the current series before the University of Cincinnati Chapter of the Society of Sigma Xi. It was entitled "Penicillin—Its Discovery, Scientific Development, Production and Medical Applications."

DR. LEO LOEWE, New York, delivered on October 25 the seventh annual Louis Gross Memorial Lecture at the Jewish General Hospital, Montreal. The address was entitled "Further Observations on the Combined Use of Penicillin and Heparin in the Treatment of Subacute Bacterial Endocarditis."

DR. PETER L. BELLASCHI, research engineer of the Westinghouse Electric and Manufacturing Company at Sharon, Pa., concluded a tour of South America in the interests of inter-American scientific and industrial coordination with a series of lectures in Brazil. One of these lectures, "Lighting Research in Field and Laboratory," was given at the Escola Politécnica da Universidade de São Paulo. On October 7 he made an address before the São Paulo Institute of Engineers on "The Protection of Transmission Lines and Station Equipment against Atmospheric Disturbances." Other lectures included addresses before the Engineering Society and the Escola Técnica do Exercito in Rio de Janiero.

THE autumn general meeting of the American Philosophical Society was held in the hall of the society on November 17 and 18. The sessions on Friday were devoted to a symposium on "Forestry and the Public Welfare" followed by a lecture in the evening on "The American Philosophical Society and the Early History of Forestry in America." On Saturday morning a general session was held.

THE two hundred and sixty-third meeting of the American Physical Society will be held at the Museum of Science and Industry, Chicago, on Friday and Saturday, December 1 and 2.

THE Electromicroscope Society of America met at Chicago on November 16, 17 and 18 under the presidency of R. Bowling Barnes, director of the division of physics of the Stamford Research Laboratories of the American Cyanamid Company.

THE annual meeting of the Society of Rheology was held at the Hotel Pennsylvania, New York City, on November 17 and 18.

THE Executive Board of the American Public Health Association (1790 Broadway, New York 19), of which Dr. Reginald Atwater is executive secretary, announces that the third Wartime Conference, the seventy-fourth annual meeting and meetings of related organizations will be held in Chicago during the week of September 17, 1945, with headquarters in the Hotel Stevens. The related organizations include the American School Health Association, the Conference of State and Municipal Public Health Engineers, the Public Health Nursing Directors, Professors of Preventive Medicine, State and Provincial Public Health Laboratory Directors, State Directors of Public Health Education and Industrial Health Consultants. Dr. Herman N. Bundesen, president of the Chicago Board of Health, is head of the committee in charge of local arrangements, and Dr. Roland R. Cross, state director of public health, Springfield, Ill., is co-chairman.

THE eighth annual meeting of the Canadian Physiological Society, cancelled in 1942, was held at Queen's University, Kingston, Ontario, on October 13 and 14. Twenty-three papers were read at the two scientific sessions. At the annual dinner, the retiring president, Professor V. E. Henderson, of the University of Toronto, directed the attention of the society members to several matters that should concern them, such as collective bargaining by scientific workers, popularization of important discoveries, adequate opportunities for research for all engaged in teaching. The officers elected for 1944–45 were: *President,* B. P. Babkin; *Secretary,* R. G. Sinclair; *Treasurer,* E. M. Watson; *Councillors,* L. P. Dugal, E. W. McHenry, M. K. McPhail, V. H. K. Moorhouse, D. L. Thomson and R. A. Waud.

THE *Journal* of the American Medical Association reports that the American Pharmaceutical Manufacturers Association has announced that the National Research Council has been chosen for its sixth annual award "in recognition of its fundamental contributions to public health in the field of medical sciences and of its essential services to the country in World Wars I and II." The award will be presented during the final day's session of the meeting on December 11 and 12 of the American Pharmaceutical Manufacturers' Association at the Waldorf-Astoria, New York. Dr. Alan Gregg, director of medical sciences of the Rockefeller Foundation, New York, will give the presentation address, on "The Essential Need of Fundamental Research in Medical Sciences for Social Progress," and Dr. Ross G. Harrison, of Yale University, chairman of the National Research Council, will give the acceptance address, entitled "The National Research Council and Its Action in Feld of Medical Sciences."

THE Foundation of Applied Research of San Antonio, Texas, has made a grant of $20,600 to the Worcester Foundation for Experimental Biology. The funds are to be used for an investigation of mammalian reproductive processes in vitro under the direction of Dr. Gregory Pincus. The work will be

carried on in the newly established research laboratories of the Worcester Foundation.

AT a meeting of the council of the Royal Society held on October 12, amendments were made to the statutes so as to make it clear that, since the passing of the Sex Disqualification (Removal) Act of 1919, there is no barrier to the admission of women into the fellowship of the society. This decision was reached after the fellows of the society had been consulted by postal vote and had approved the amendments ratified by the council on that day.

DISCUSSION

BIOCHROMES[1]

THE natural coloring matters of plants and animals are receiving ever-increasing attention in various fields of experimental biology. The present purpose is to refer briefly to the heterogeneous class of biological pigments and to point out fundamental similarities which would appear to justify their collective designation by the title given to this communication.

Professor Sumner[2] has aptly criticized the term "pigment" as a word of relatively loose application. He insists that the word is best limited to its strictly functional sense, but points out that the term arising from a Latin verb meaning "to paint" has been extended by many biologists far beyond its original significance of an artificially imparted color, to include now all naturally colored substances in living systems. It is true that many Greek and Latin words have undergone gradual modification and expansion so that their present significance departs widely from the original limits of meaning.

The present writer, for one, would accept the broad term "pigment" as signifying, in biology, all colored substances, whether their chief functions appear to include those of imparting concealing or advertising colors, or whether they may participate in known or obscure biochemical reactions, or indeed have a known role at all. The word is widely useful, and will undoubtedly persist in general biological parlance.

There is, nevertheless, a valuable point in my colleague's criticism. The term "pigment" is often applied to a substance which is designed to, or merely happens to impart color to something else, whether man-made or naturally occurring. The classes of pigments which interest biologists do not ordinarily include colored inorganic compounds employed in commercial paints or the synthetic dyes of the organic chemist. The histologist's tissue-stains are useful to him only in the artificial differentiation and identification of protoplasmic structures. Concerning natural colored substances, while these may serve occasionally to distinguish color-variants and heritable mutations within species, or to identify organs, tissues or biological products in laboratory specimens, here again the primary consideration is the usefulness of color to the investigator. The chemical nature and possible physiological significance of the chromophoric molecule is merely incidental and often quite neglected.

From the standpoint of the biochemist whose interests are concerned with the metabolic significance of natural coloring matters, the designation of these by a discriminating scientific term has long been desirable. In response to an inquiry, Dr. George M. Calhoun,[3] late professor of Greek in the University of California, once suggested to the writer the descriptive and self-explanatory term *biochrome,* with an adjective *biochromatic* (*biochromic* is perhaps preferable), and a collective noun *biochromy.* This word and its derivatives have therefore been employed in this article and elsewhere.[4,5]

Considering the great chemical diversity among the biochromes or natural biological pigments, why should the biochemist feel justified in setting them apart as a class and in giving them a collective name? Let us return to this question in a moment.

In any series of natural classification there will occur overlappings and inexactnesses at the borders of groups. These will occur especially when both chemical and physiological or other biological criteria are involved in the system. As an example, we recognize, under the general heading of *catalysts,* an extended series of very diverse compounds whose common property is that of controlling the occurrence or the rates of various chemical reactions. Excluding now the inorganic and synthetic accelerating (or retarding) reagents of industry and the chemical laboratory, we have still a large and assorted group of biocatalysts, including the numerous enzymes, hormones and vitamins which promote, maintain, restore or otherwise influence diverse physiological functions. The biocatalysts, although necessarily further subdivided into classes, share as common characteristics, first, their origin and occurrence in living systems, and secondly, varying degrees of control over the promotion or rate of given biochemical reactions or chains of reactions in the organism.

[1] Contributions from the Scripps Institution of Oceanography, New Series, No. 240.

[2] F. B. Sumner, *Sci. Monthly,* 44: 350, 1937.

[3] Personal communication, 1936.

[4] D. L. Fox, SCIENCE, 100: 111, 1944.

[5] D. L. Fox, D. M. Updegraff, and G. D. Novelli, *Archives of Biochem.,* 5: 1, 1944.