

# THE NATURE OF THE WORLD AND OF MAN

*By*

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## PREFACE

The purpose of this book is to present an outline of our knowledge of the physical and the biological world, and to show the position of man in the universe in which he lives. Or, in more personal terms, it aims to assist the individual in the very important problem of forming well-defined conceptions of the Cosmos and of his relation to it.

Not only the aims of this volume, but also the plan on which it has been written, have been determined in large part by the fact that it contains the subject matter of a "survey course" given each year by its authors at the University of Chicago to a group of selected first-year students of superior intelligence. The survey course was designed to give capable students a preliminary view of the rich intellectual fields that lie before them so that, on the one hand, all of their work shall have a large measure of unity and coherence, and, on the other hand, they will be able to decide early what particular subjects they may wish more thoroughly to explore.

The course as given at the University of Chicago was initiated by Dean Ernest H. Wilkins, and it was organized by H. H. Newman, who has acted as director. Formal lectures have been given by sixteen instructors, each a specialist in his field. Each lecturer has conducted also a conference in his subject. Detailed class exercises and written reports have been directed by H. H. Newman, J Harlen Bretz, and Merle C. Coulter. The success of this educational experiment, from the standpoint of both instructors and students, has seemed to make advisable the production of this volume. Under the direction of another group of lecturers the course is extended to those problems that concern the relations of men with one another—the social sciences—and it is hoped that a second volume covering these fields will appear later.

The aims of the course and the severe restrictions of space have made it necessary for the authors to omit largely those technical scaffoldings by means of which their respective scientific structures have been erected. Generally they have been compelled to limit themselves to explaining final conclusions, but occasionally, when it has seemed feasible, they have given brief accounts of the means by which these conclusions have been reached. It is regretted that it has not been possible more frequently to show in detail the workings of the scientific method. It is believed, however, that these deficiencies are made up, at least in part, by the outside reading that is required, and that is regarded as essential for all who use this book. A list of books for accessory reading is appended to each chapter.

The authors of this book have not treated science as something cold and austere and apart from human life. On the contrary, it glows with the burning enthusiasm of those who have cultivated it; it is severe only in the standards of truth that it maintains; and it has aesthetic aspects as well as practical. There has been no hesitation in pointing out the present great value of science to mankind and the hopes for better things that it promises for the future.

During a period of four months the authors have spent one evening a week in conference on their completed manuscripts. Each author has read his chapter before his associates for their suggestions and criticisms, which have been numerous and valuable. Moreover, each chapter has been critically examined by at least one person beside its author and the editor. Although there has been an unusual amount of close co-operation in the preparation of this book, each author is responsible only for the chapter he has written.

The book is directly due to the inspiration from students, eager to learn, able to discern evidence, and prepared to face facts without fear. To these students and to other seekers of truth, outside as well as inside the colleges, this book is affectionately and hopefully dedicated by

THE AUTHORS

## PREFACE FOR SECOND EDITION

Since the publication of the first edition we have had the benefit of valuable constructive criticism from specialists who have read *The Nature of the World and of Man*. Many of their suggestions, as well as changes recommended by the authors, have been incorporated in this revision. The book is a co-operative undertaking, and we plan to revise it frequently in order to keep it abreast of the most recent advances in science.

The most important changes will be found in the chapter on "The Nature of Chemical Processes," which now appears in a much less difficult form, and in the chapters on "Energy, Radiation, and Atomic Structure," and "Man from the Point of View of His Development and Structure." Minor changes have been made in several other chapters, and both Glossary and Index have been enlarged.

H. H. NEWMAN, *Editor*

## ACKNOWLEDGMENTS

It is a pleasure to acknowledge our indebtedness to all those authors, publishers, and artists whose co-operation has helped to make this volume possible.

Among the artists who have contributed to this book, especial mention should be made of Mr. Carl F. Groneman, who illustrated Professor Cole's chapter, using original material borrowed from Logan Muscum, Beloit College, and from the Field Museum of Natural History; and of Mr. Kenji Toda, artist of the Department of Zoölogy, who drew most of the figures in Professor Allee's chapter.

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THE EDITOR

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