Biochemistry's successes largely determine not only the current level of medicine, but also its possible further progress. One of the main problems of biochemistry and molecular biology is the correction of defects in the genetic apparatus. Radical therapy of hereditary diseases associated with mutational changes of certain genes responsible for the synthesis of certain proteins and enzymes is, in principle, possible only by transplanting synthesized in vitro (Latin - in a test tube) or isolated from cells similar "healthy" genes.

An equally important task is mastering the mechanism of regulation of reading genetic information encoded in DNA and deciphering at the molecular level the mechanism of cellular differentiation in ontogenesis, which would allow more detailed and step-by-step changes to be made to the genome. Elucidating the picture of life at the molecular level will allow us to fully understand the processes in the body, will open up new opportunities in the creation of effective medicines, combating premature aging, the development of cardiovascular diseases, and prolonging life.

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SOIL SCIENSE AS A SCIENCE

Soil physics is a phase of soil science that has been receiving increasing interest and attention within the last twenty years. Numerous technical contributions have appeared in English, French, German, and Russian scientific journals. In almost every instance, the individual has been interested in only one particular aspect of the physical properties of the soil. The field is so large that it limits the scope of activity of and one person.

Although much research in the field of soil physics has been accomplished, teachers of the subject have been handicapped by a lack of suitable instructional material. Unless the teacher happens to be closely associated with soil-physics research and has access to the numerous foreign publications, the preparation of a comprehensive course in soil physics is a difficult task.

The author has taught a course in this subject for the past nine years and has been fortunate in having had to review most of the foreign work in conjunction with his research projects. Practical experience in various aspects of soil-physics research, in addition to a rather wide coverage of French, German, and Russian literature, has resulted in the preparation of a complete set of notes which have been used to build up

a course in soil physics that has been rather favorably received by the students, especially those of graduate standing. Incidentally, the student reactions to the philosophy and content of the course have contributed much to the final shaping of the material into a form that can be easily and clearly presented.

An attempt has been made to discuss the various phases of soil physics from the point of view of the teacher explaining them to his class. Simple analogies and often extremely detailed discussions have been used to illustrate a significant point. The author has done this purposely, because it is his firm conviction that a subject cannot be taught successfully by assuming that the student is fully aware of the implications of the subject that seem so obvious to the highly specialized teacher. The book is designed primarily for the advanced undergraduate students of fairly good caliber and graduates. There are several sections that undoubtedly will prove too involved for strictly undergraduate classes. However, they may be omitted without materially affecting the continuity of thought in the book. Detailed mathematical discussions were purposely avoided for the sake of clarity. They may be added by the teacher who desires to use them.

They book does not propose to give complete citation of all published literature on a particular subject. The references at the end of each chapter have been selected because the author felt that they represented the more important points of view. Considerable reference has been made to some of the classical soil-physics research that was carried out during the last twenty-five years of the past century. This has been deemed essential, since many of these publications are not universally accessible.

In many instances, experimental evidence does not permit the formulation of an exact statement of fact concerning a particular property. The author has attempted to present the different viewpoints as he sees them and has stated his own personal opinions regarding these viewpoints. His opinions, of course, are subject to change as soon as further research data warrant.

It is realized that other investigators may view a given phenomenon differently from the way it is discussed in this book. Nevertheless, the material is presented to represent the author’s concept of the subject. Differences in interpretation are usually only differences in points of view. The author has tried to develop a concept of the fundamental aspects of soil physics and their practical application. Special attention has been given to the practical interpretation of each of the different phases of the subject/ It is believed that this philosophy will make the book not only more interesting but also more usable.

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