

LABORATORY EXPERIMENTS IN PHYSIOLOGY

Kang-You Shaw

LABORATORY EXPERIMENTS IN PHYSIOLOGY

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WITH 97 ILLUSTRATIONS

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PREFACE TO FOURTH EDITION

In this revision all the material has been carefully gone over and many, even though minor, changes have been made.

Some experiments have been deleted and a few new ones added. Some new illustrations are included.

W. D. Z.

PREFACE TO THIRD EDITION

As in the previous revision, some experiments have been deleted and a few new ones added. The amount of material covered has not been greatly altered.

By a careful revision of the "preparation" paragraphs and of the questions found throughout the body and at the conclusion of the directions, I have sought to link the laboratory exercises still more closely with the didactic work.

W. D. Z.

PREFACE TO FIRST EDITION

This laboratory guide is the outcome of years of teaching. It is especially planned to accompany my Textbook of Physiology, but, as no direct references are made to it, any other textbook can be used.

Because a large number of those replying to the questionnaire sent out by the publisher favored the inclusion of some experiments in chemical work, the second section of the manual is devoted to the rudiments of physiologic chemistry.

In writing, I have had in mind the student whose time allotted to this subject is somewhat limited. The simpler experiments and those requiring a minimum of laboratory equipment have for this reason been selected; and, if necessary, still more careful selection, to adapt them to the special needs of the students and to the time and laboratory facilities, can be made by the instructor. The book has not been burdened with directions for elaborate demonstrations usually performed by the instructor; larger manuals are available for that purpose.

Realizing the great value of time, and that the primary object of the laboratory work is not to develop great technic, I have made the directions for procedure very explicit. All new "set-ups" for apparatus are abundantly illustrated. However, that even this may stimulate thought on the part of the student, frequent "why's" and "why not's" are inserted.

To preface an experiment with a long and detailed introduction usurps, in my opinion, the function of the textbook. The student should regard a laboratory experiment in the same light as an assignment in English or Mathematics, something to be properly studied by him before coming to the laboratory. The laboratory period is too short for studying the nature and content of the problem and its method of solution; this should be done at home. To guide him in this, nearly all experiments are prefaced with "preparation" questions which aim to lead up to the problem and to connect it, to a certain extent, with facts already mastered. These questions frequently require reference to the textbook and other sources of information. I have refrained from directing the student to book, chapter and verse, because of the multiplicity of texts used in the various schools and the constant appearance of new editions. Any modern textbook is amply supplied with references to guide the student. A student should learn how to use, independently, a library.

The present laboratory guide is perhaps made conspicuous by the absence of all kymographic records and coordinate graphs. Most textbooks show them in abundance, and placing them in a laboratory manual has perhaps a tendency to make the student "ape" them too much. A beautiful tracing is not a matter to be despised, but the student must thoroughly realize that its proper sphere is only as a means to acquire knowledge. If model tracings and graphs are deemed advisable, those obtained by the preceding class, suitably inscribed with the student's name and placed in a frame hung on the wall, will be of more inspirational value than a perfect copy on the printed page.

I am greatly indebted for many of the illustrations to Dr. D. E. Jackson and to the Harvard Apparatus Company.

Any criticisms or suggestions by those using the book will be highly appreciated.

W. D. Z.

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