

Rec'd  
no 9/18

(Advance Copy)

C.b.36

**WAR DEPARTMENT**  
**COMMITTEE ON EDUCATION AND SPECIAL TRAINING**  
**SPECIAL BULLETIN**  
**ON**  
**BIOLOGY**

The course may be given in one term of twelve weeks with nine to eighteen hours per week, or may be extended to two terms of nine to eighteen hours each. The work should be divided approximately equally between botanical and zoological subjects, or Botany and Zoology may be presented in different terms, both subjects being required to complete the course in Biology. Following the elementary course in Biology, it may be found desirable to offer advanced courses leading toward special fields of study and research.

It is believed that the best results will be obtained if the course in biology is given in one term, but it may be desirable to divide the term into two 6-week periods devoted respectively to Botany and Zoology. The course should consist of laboratory work on which lectures and class discussions can be based and, when possible, some field studies are desirable. Demonstrations should supplement or replace laboratory work only when it is necessary to save time or when the large size of classes makes individual studies impracticable. Any text-book aid that will hold students to self effort and concentration may be used with profit.

The biological courses now offered in the universities and colleges are generally fundamentally correct in content and method and they can serve the present emergency best by such modifications as will bring forward matter emphasized by war conditions. The services of Biology are essentially constructive and find their war application in fields of sanitation, hygiene, nutrition, forestry, and in the study of vegetation in relation to physiography. The present emergency has demonstrated to a pronounced degree the great value of biology in advancing human welfare.

It is apparent that Biology is preparatory to and necessary for an understanding of a number of specialized subjects beyond its immediate horizon. It bears directly on the arts of medicine and agriculture\* and on the general health and economic life of a people and should be recognized as of immense and direct value in the organization of the resources of a country on a war basis.

The course in Biology primarily should provide training for students who propose to become candidates for commissions as Officers of the

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\*Special Bulletin C.b.31 deals with Medical and Premedical courses; Special Descriptive Circular C.b.30 deals with Agriculture; Special Descriptive Circular C.b.15 deals with Hygiene and Sanitation.

Line, but it should be a course basic for future students of medicine and for those who intend to pursue advanced work in agriculture, sanitation, hygiene, and in certain fields of engineering. The subject matter of the course will naturally group itself in fields of Botany and Zoology and its illustrative material should be selected with a view to its practical interest and bearing on prominent topics in the course. Some of the more important subjects which may be developed in the course are as follows:

#### BOTANICAL SUBJECTS

1. The general structure and physiology of the seed plant.
2. The elaboration and storage by plants of the more important animal foods, their nature and availability to man.
3. The elements of wood structure in relation to timber values. Plant products of especial economic importance such as oils, gums, resins, drugs, dyes, tannins, etc.
4. Some of the lower plants and especially those concerned with the pollution of water supplies, with fermentation and decay, and with disease. Sphagnum and its uses.
5. Important plant associations, and their bearing on camp sites and military operations. Types of swamps as indicated by their vegetation. Forest and shrub vegetation in relation to physiographic and climatic conditions, and to geological formations.

#### ZOOLOGICAL SUBJECTS

1. The general structure and physiology of the vertebrate.
2. Principles of nutrition. Balance of foods.
3. Protozoa in relation to disease.
4. Insects. Studies on fleas, lice, flies, or mosquitoes; their significance as carriers of disease or otherwise affecting health.
5. Habits of rats and mice, roaches and other insect vermin in relation to disease and filth.

It is urged that throughout the course elementary principles of organic evolution should be made clear in their philosophical bearing. In appropriate connections simple vital statistics should be presented, such as the effect of war on birth and death rates, on health conditions, on food and its distribution.

COMMITTEE ON EDUCATION AND SPECIAL TRAINING,

By R. C. Maclaurin,  
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