

NATURE STUDY—No. VIII.

THE PROPOSED COURSE IN NATURE STUDY FOR PUBLIC SCHOOLS.

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At the annual meeting of the Ontario Education Association in Toronto last Easter, a draft of "proposed changes in the Public and High School Courses of Study" was submitted for consideration, and in all probability these changes (with minor modifications) will come into effect at an early date.

In this scheme it is proposed to make a somewhat definite course of Nature Study compulsory for all classes in Public Schools, and to insist that all Public School teachers take an extended course of training in Natural Science before entering the Normal School. This forward movement cannot fail to be of interest to every reader of THE NATURALIST, and in future discussions it may be of value to know something of the content and sequence of the Nature Study material which is to be dealt with in the Public School.

The following is a brief outline of the proposed Course of Study for the first four classes :

FORM I.

NOTE.—From the character of Nature Study, the course therein must be more or less elastic, and a selection should be made therefrom subject to the approval of the Inspector. The acquisition of knowledge should be secondary to the awakening and preserving the pupil's interest in nature, and to training him to habits of personal observation and investigation. The topics are suggested as suitable ones from which a course which will meet the conditions of the school may be selected ; but the treatment must be suited to circumstances, age, and experience of learners, and to the seasons of the year, accessibility of materials, etc.

Animal Life : Habits of pet animals, their care and food ; domestic animals on the farm, their care, habits and uses ; birds, their nesting, song, food, migrations in the autumn ; metamorphosis of a few conspicuous butterflies or moths.

Plant life : Work in school garden ; study of a plant, as a geranium or pansy, from slip or seed to flower ; caring for plants in pots ; buds, their preparation for winter, their development ; autumn leaves, collection, forms, tints ; economic fruits, collection, forms, how stored for winter, fruit as seed holders, dissemination

of seeds ; roots and stems, comparison of fleshy forms, uses, how stored for water.

Life on the Farm : Harvesting, primitive and modern methods compared ; preparation for winter ; the barn and its uses ; activities of the farm during winter ; winter sports and social life on the farm ; the varied operations of spring time.

Observations of rain, snow, and frost ; spring time as awakening to new life, effects of sun and moisture on the soil.

FORM II.

Course of Form I. continued. Animal Life. Life history and habits of domestic animals and familiar wild animals, as squirrel ; earth-worm, habits, structure, uses ; toad, habits, structure, uses ; observation of live insects and their activities, comparison of young and adult stages.

Plant Life : Cooperative and individual work in school garden ; cultivation of plants in pots with observation of the development of leaves and flowers ; parts of leaves and flowers ; change of flower to fruit and fruit to seed ; functions of the parts of flowers ; the forms and uses of trees ; activities connected with forestry and lumbering, connect with study of pioneer life and present conditions on the prairie.

Different kinds of soil, as sand, gravel, loam, leaf-mould, and clay ; experiments to ascertain how soils are composed, whether of mineral or of decayed organic material, and which best retains water ; additional phenomena of spring in the vicinity of the school, cause of melting snow, floating ice, etc. ; how nature prepares the soil for growth of plants.

Observation of farm, garden and household operations.

FORM III.

Course of Form II. continued. Animal Life : Adaptation of different kinds of animals to their respective habits ; birds, life history of types, habits of wild fowl in different seasons ; fish, forms and uses of different parts of the body, food and how obtained ; life histories of moths, butterflies, beetles and grasshoppers ; useful insects, as ladybird and dragon-fly ; harmful insects and methods of destroying them.

Plant Life : Germination of seeds under controllable condi-

tions and in the school garden ; more particular study of the forms and functions of the parts of plants, and variations in these forms and functions in different plants ; observations on the culture of farm and garden crops and orchard and shade trees ; the observing and the distinguishing of the common forest trees.

Observing local minerals and rocks, their properties and uses ; experiments on different kinds of soil ; distinction between hard and soft, pure and impure water, test and methods of purification of water.

Sources of Heat : Experiments to show the effect of heat in the expansion of solids, liquids and gases ; practical applications. Temperature ; thermometer, construction and graduation. Methods of transmission of heat, conduction, convection and radiation ; causes of winds and ocean currents ; ventilation.

FORM IV.

Course of Form III. continued. Animal Life : Relation of fishes, birds and wild animals to man ; life histories of conspicuous and economic insects ; organ and functions.

Plant Life : Study of organs of plants and their functions ; study of economic and wild plants from seed to fruit in the school garden, home garden, farm and forest ; weeds injurious to crops and methods of destroying them ; buds and twigs ; wood, rings, grain, and bark, uses, etc. Experiments to show composition of soils and their relation to drainage, temperature, etc. ; varieties of soils adapted to different crops ; fertilizers, etc.

Implements and tools used on the farm and in the household, mechanical principles applied in their construction.

The atmosphere, its composition. Combustion : simple experiments, study of candle flame products. Changes produced in the air by respiration. Reciprocal relation of plants and animals as regards the atmosphere ; impurities in air. Gravity : air and liquid pressure ; the barometer. Cohesion and adhesion, the nature of these forces ; phenomenon of solution and diffusion ; amorphous and crystalline forms of matter. Practical use of heat, steam and electricity in connection with the study of industries.

FORM V. AND CONTINUATION CLASSES.

The work outlined for this class is too extended to allow of reproduction here. It includes definite courses in Botany,

Zoology, Physics and Chemistry, based upon work taken in previous classes and treated by a more purely scientific experimental method.

THE TEACHER'S PREPARATION.

The courses of study in the High Schools are to be taken up in three main divisions ;

- (a.) Lower school, covering from two to three years ;
- (b.) Middle school, from one to two years, and
- (c.) Upper school, two years.

Teachers seeking Junior Non Professional standing are to be examined on the Experimental Science of the Lower school course and the Physics and Chemistry of the Middle school course.

Physics and Chemistry are to be taken during four years instead of during one or two, as is now the case. These subjects are to be taken only during the winter months, in the Lower school course, Botany and Zoology being taken during the fall and spring months.

The course in Botany includes a study of representatives, such as flowering plants, ferns, fungi, etc., and deals with structure, life-relations, plant societies, plant physiology, etc.

The course in Zoology is designed to include representatives of the animal world. Special attention is directed to insects and birds, life-history, habits, adaptation to climate, etc.

In both courses the work is intended to be practical, and, to ensure this, class text-books are not to be allowed.

Speaking generally, the proposed course in Natural Science (compulsory for teachers in training before entering the Normal School) will extend over from three to four years and occupy one lesson period per day.

During the Normal term the teacher in training will review the work done in the High School, and reconstruct it from the standpoint of the learning process. On the psychological side, he will study the subject in its logical sequence and in its relation to the needs and powers of the developing mind, with a view to the proper selection and arrangement of material and to the best methods of presentation. On the historical side, he will familiarize himself with the best of what has been done and is being done elsewhere, in order that he may avoid errors and avail himself of the advantages of past experiment. With such an equipment by way of preparation, the teacher who possesses growing power and enthusiasm, should be able to render efficient service, and this is an important consideration ; for, after all, the success of the movement must rest very largely in the hands of the teacher.



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