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To cite this article: Harry M. Clem (1912) Laboratory Work in Physiography in the Chicago High Schools, Journal of Geography, 10:9, 290-295, DOI: [10.1080/00221341208985712](https://doi.org/10.1080/00221341208985712)

To link to this article: <http://dx.doi.org/10.1080/00221341208985712>

Published online: 20 May 2008.

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LABORATORY WORK IN PHYSIOGRAPHY IN THE CHICAGO HIGH SCHOOLS

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IN this article an attempt is made to summarize the facts regarding the laboratory work in physiography in the high schools of Chicago. It will be difficult to make an entirely accurate statement of those facts because the courses in the high schools have been undergoing radical changes both in variety and scope, and these changes have very materially altered the course in physiography and have affected the quantity and probably the quality of the laboratory work. The efforts of the teachers to revise the course in physiography in accordance with the late rapid evolution of the subject has led to a different arrangement in the sequence of the laboratory exercises and even to the introduction of new ones. Since this new arrangement of exercises is in the tentative stage a further difficulty in discussing the laboratory work arises.

The most important changes in the course of study came about in 1910 when the Board of Education made a general revision of the courses in the high schools, revising the old ones, adding a large number of new ones and changing the period of time to be devoted to most of the subjects to be incorporated. Previous to that date there were three high school courses offered, each covering a period of four years. They were: (1) a General Course, (2) a Technical Course based either on Latin or a Modern language, and (3) a Scientific Course.

Under these courses physiography was allowed 180 hours or 6 hours per week for 30 weeks, of which time two consecutive hours per week were expected to be devoted to laboratory work. Physiology, the teaching of which fell to the lot of the physiography teachers, was required of every pupil, and filled out the remaining ten weeks of the year not occupied by physiography. In the technical schools physiography was required of all pupils. In the other two courses two years of science was required, but the large majority of pupils elected physiography.

After the revisions were made the pupils entering high school in September, 1910, were confronted with an array of 21 courses instead of three from which to make their selection. Of these 21 courses, 11 covered a period of four years and the remaining ten, called "vocational courses," covered a period of two years. The following tabulated statement shows the consideration given to physiography in the new courses:

I. Four Year Courses

- a. Physiography required in first year, one semester, in the following courses: English, General, Foreign Language, Science, Manual Training.

- b. Physiography or Chemistry required only in fourth year, two semesters in the Teachers' College Preparatory Course.
 - c. Physiography not required in the following courses: Business, Builders, Household Arts, Architectural.
- II. Two Year, Vocational Courses
- a. Physiography not required in the following courses: Accounting, Stenography, Mechanical Drawing, Design, Advanced Carpentry, Pattern Making, Machine Shop, Electricity, Household Arts, Printing.

In all the courses containing physiography, except the Teachers' College Preparatory, the subject has been allotted only 100 hours instead of 180, as formerly, or 5 hours per week for 20 weeks. Physiology, the running-mate of physiography, and whilom the "poor relation" of the family of science courses, but now the latest candidate as hand-maiden to general elementary science, was allotted 20 weeks of 5 hours each instead of 10 weeks of 4 hours each, as formerly, and is required in every one of the 21 new courses adopted in 1910. The physiography teachers, possessors of the classic versatility of the geography teachers, are expected to turn lightly from their physiography and teach the new courses in physiology. Only 6 of the new courses contain physiography but the subject has not been, except for time, so much encroached upon as it appears to be at a casual inspection because it occurs in the courses pursued by the great majority of pupils entering the high schools.

When the subject was so severely cut down in time, the teachers were obliged to arrange a new course of study and it was a difficult problem to compress so rich a subject into 20 weeks and provide for adequate laboratory work. A syllabus of a tentative 20-weeks course has been compiled, and a new set of laboratory exercises, simplified and written according to the new views of the subject, has been prepared by Messrs. Smith and Stahl, and Miss Sykes, and is published by D. C. Heath and Company.

The laboratory course before the revision was made was based on the Everly, Blount, Walten manual, but the present course is based upon the new manual just mentioned. A parallel arrangement of the laboratory exercises will give in the smallest possible number of words the scope and nature of the past and present courses in physiography.

Minimum course in physiography, laboratory exercises based on the Everly, Blount, Walton manual and used previous to September, 1910. (The number of the exercises in parentheses.)

A Globe Exercise (1)

Map of Standard Time (7)

Laboratory or Demonstration Exercises on Work of Agents of Weathering

The Study of Minerals (10)

- The Study of Rocks (11)
Demostration of Solution and Precipitation (15)
Vertical and Horizontal Rock Section of Chicago (48)
First Exercise in Contours (19)
Second Exercise in Contours (20)
The Mount Shasta Map. Land Form and Profile (40)
Development of V-Shaped Valleys, La Salle, Ill., Sheet (21)
Mature Drainage, Charleston or Savanna Sheet (33, 25)
Swamp Plain and Levee, Donaldsonville, La. (26)
Mississippi River Commission Map No. 14 (27)
Study of Glacial and Water Worn Pebbles (42)
Glaciers, Mt. Shasta Special Sheet (43)
Some Maps Showing Glacial Topography
Plateaus, Kaibab, Ariz., Sheet (37)
Appalachian Mountains, Harrisburg Sheet (38)
A Volcanic Cone, Shasta Sheet (40)
Demonstration, Making a Barometer (57)
Relative Amounts of Heat Received From the Sun (66)
Sunrise and Sunset Graphs (5)
Elementary Exercise on Isotherms (67)
Distribution of Temperature (68)
Effect of Latitude on Temperature (69)
Convection in a Gas (65)
Effect of Land and Sea on Distribution of Temperature (70)
Cyclones (Map study) (76)
Winds and Currents (map) (87)
Humidity (demonstration) (63)
Rainfall in the U. S. (map study) (77)
Rainfall and Vegetation (map study) (89)
Section across the Atlantic (82)
Boothbay, Me., sheet (85)
Atlantic City map (84)

Minimum course in physiography, laboratory exercises based on the Smith, Stahl, and Sykes manual and recommended for use with the new short course in physiography.

- Expansion Due to Heat (1)
Insolation. The Heat Received From the Sun (2)
Temperature Distribution over the Earth (3)
Moisture in the Air. Humidity (6)
The Mercury Barometer and its Action (9)
Study of the Weather Map (14)
The Temperate Latitude Cyclone and Anticyclone (15)
Map of Planetary Wind Belts (11)

- Winds and Currents (12)
 The Local Weather (16)
 Distribution of Rainfall in the United States (18)
 Monthly and Seasonal Rainfall in the Climatic Regions of the United States (19)
 Influence of Rainfall on Vegetation (20)
 Parallels and Meridians on a Globe (21)
 Parallels and Meridians on a Map of the Western Hemisphere (22)
 Parallels and Meridians on a Map of the World (23)
 Standard Time (24)
 Delta Table Study. Work of Running Water (28)
 The Mississippi and St. Lawrence River Basins (29)
 Iron and Coal (31)
 Contour Lines and Contour Maps (32)
 Comparative Study of Contour Maps (33)
 Study of Stream Erosion From a Contour Map, Highwood, Ill. (36)
 Topographic Effects of Stream Erosion, Savanna, Ia., Ill. (39)
 The Work of a Meandering Stream, Marshall, Mo. (40)
 River Flood Plains, Donaldsonville, Ia. (42)
 The North American Ice Sheet (43)
 Glacial Topography, Whitewater, Wis., Weedsport, N. Y. (45)
 Shore Lines, Atlantic City, N. J., Boothbay, Me. (48)
 Effect of Erosion upon Rocks of Unequal Hardness, Harrisburg, Pa. (53)
 Rugged Mountains, Platte Canyon, Col. (54)
 Plateaus, Charleston, W. Va., Kaibab, Ariz. (55)
 Note: At least one field trip should be taken by every class.

The amount of laboratory work required in the past, before the shorter course was instituted, was at least two hours per week for 30 weeks or a total of 60 hours, but a few teachers believe in more than that amount. At present there is no definite amount of work required but probably one hour per week will be the standard. Many teachers yielding to habits learned while teaching a more extensive laboratory course will devote more than one hour a week to that phase of the physiography work. In the past, fairly complete equipments were furnished for laboratory work in physiography. Delta tables, contour maps, wall maps, small globes, models, meteorological instruments, chemicals, etc., were sufficiently provided to enable the teacher to carry out the exercises listed above in the older course.

The teachers as a body are very much in favor of laboratory work and have no thought of abandoning it. Their conviction of its importance and training qualities is based on the facts that it is a valuable educational instrument and is liked very generally by the pupils. They are interested

in the demonstrations by the teachers and work, on the whole, so diligently at the exercises which they are required to do individually, that the teachers are led to give all the laboratory work that is compatible with the scope of the course and the time allotted to it. Teachers have spent as much as three hours on a single topographic map and the average time spent by 29 teachers who were interviewed was 65 minutes per map. The interest of the pupils has its limits, of course, and will not endure a very tedious and detailed interpretation of maps and graphs. As soon as the general idea in the graph, for example, is discussed, the pupils are ready for new conquests and, unless the teacher is persistent in his efforts at interpretation, the exercises become mere tasks in mechanical drawing. Not a great amount of laboratory work outside of the contour maps, graphs, and minerals is done individually by the pupils because of the impossibility of directing 150 to 200 enthusiastic and impulsive pupils per day; hence demonstrations are made by the teachers, to the manifest satisfaction and interest of the pupils.

Since physiography has been taught in the city only 15 years and the subject has undergone many changes, the character of the laboratory work has kept pace with the evolution of the subject. An examination of the laboratory manuals used in succession, shows a notable change in the character of the work, passing from difficult, detailed and technical exercises with pure physiography uppermost, to easy, simple exercises treated more generally and with less emphasis upon pure physiographic details, and greater attention devoted to the life relations. The Everly, Blount, Walton Manual was a great advance over the manual compiled by Frank J. Darling and other Chicago teachers, and the new manual by Smith, Stahl and Sykes is a still further advance in the way of exercises adapted to the young minds of first year high school pupils.

There has been a change in the teaching of topographic maps. They were rather overworked in the past, and were too much studied for the sake of merely reading such maps, yet they are still liberally studied in the laboratory. Not so painfully dissected as formerly, they are used to present general aspects of typical land forms. Since the life relationships of physiography are now being emphasized, the teachers are using the maps as a means of developing ideas of such relationships. The tendency is to study a much larger list of maps than formerly, to neglect tedious details and to study the maps comparatively as to general features shown and as to the life and economic relationships. The making of cross profiles from topographic maps is out of vogue, and a very small per cent of the teachers require the pupils to make models of the region shown on the maps.

In other laboratory exercises, not much change is noticeable except probably that minerals and rocks are much more sparingly studied than formerly, or are entirely neglected. A number of the teachers are beginning to de-

vote a little more attention than formerly to the laboratory study of general maps in order to teach the geographic distribution of the physiographic elements. In reference to the laboratory exercises as a whole, there is, as mentioned above, a movement toward greater simplicity in their treatment in order to bring them down to the level of the mind of the high school freshman. The scope of the various exercises and the questions pertaining to their development look far less like university work than formerly, and in so far the subject of physiography has increased in the appreciation of the pupils, and its presentation is becoming more a pleasure than a work of exasperating labor.

ROBINSON CRUSOE—A STUDY IN THE NEW GEOGRAPHY

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THE New Geography is essentially a study of relationships. The subject-material centers about man and his earthy environment. It is the account of how man, wrestling with Nature, is building his institutions. What he has done today, becomes a record tomorrow and we call it history. There is no difference between the fundamentals of geography and history, except the *time* element. Both deal with man's struggle to make a living. The purpose of history is to preserve the experiences of mankind that the new generations may begin somewhere about where the old ones left off.

The story of Robinson Crusoe lives because it expresses the fundamentals of human life. It is the story of a man, who, while adapting himself to his surroundings, succeeds in making himself their master. Had he failed, DeFoe could not have written the story. No one would read it if he had. Robinson Crusoe epitomizes in the individual the experiences of the race. The story is so familiar it hardly needs repetition. But the purpose of this article is to call attention to some things in Robinson Crusoe's experiences that fit in with the more modern conceptions of geography and its teachings.

The first night Robinson spent on the island saw him revert to the primitive man. He climbed a tree and made his bed between the forks of the limbs. He also took a short club with him to ward off any possible enemies. But in a few days, "Having now brought my mind a little to relish my condition, and giving over looking out to sea to see if I could spy a ship, giving over these things, *I began to apply myself to accommodate my way of living, and to make things as easy to me as I could.*"

Until the vessel was pushed off in a storm he brought much of the ship's material to shore. He built him a house in the face of the rock. He needed a chair and a table, so he made them. "I had never handled a