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Title: The context of education and the curriculum for Science in New Brunswick Public Schools (1941-1950).

Hypothesis: The New Brunswick education system changed in many ways between 1941 and 1950, the use of science resources grew throughout this time period.

Discussion of Sources:

Annotated Bibliography:

- a. Primary Resources: At the University of New Brunswick, Harriet Irving Library we explored the following resources:

New Brunswick Department of Education. (1944). *Departmental Examinations on Completion of High School Subjects*.

This provincially regulated examination document contains the junior matriculation examinations which would be distributed to students upon completion of High School. This document contains copies of the actual examination that would be distributed to students.

Blakeny, H. C. (1942). *Programme of Studies for New Brunswick Schools*. Saint John, N.B.: J. & A. McMillan, Limited, Printers.

New Brunswick Department of Education. (1941-1942). *Outline of Courses of Study for Public Schools*. Board of Education.

New Brunswick Department of Education. (1944-1945). *Outline of Courses of Study for Public Schools*. Board of Education.

New Brunswick Department of Education. (1949-1950). *Outline of Programme of Studies for High Schools*. Board of Education.

This reference for teachers and administrators, provides a comprehensive list of courses, approved texts, recommended teacher resources, subject content and suggested teaching methods. These references were authorized by the board of education and distributed annually, through the New Brunswick Department of Education.

The New Brunswick Department of Education. (1942-1945). *Annual Report 1942-45*. Fredericton: The Board of Education.

The New Brunswick Department of Education. (1949-1951). *Annual Report 1949-51*. Fredericton: The Board of Education.

The Annual Reports cover a vast amount of information including teacher licensing regulations, statistics for pupil enrolment, total expenditure records, school bus insurance allocation, etc. The reports are comprised of the Chief Superintendents report, a report from the president of the University of New Brunswick, the report of the principal of the teachers' college and the county or city Superintendent's Report. In addition to individual reports, lists of trustees, county finance board members, attendance, teacher employment, visits, examinations and grants are documented.

The New Brunswick Education Forum. (1946-1950). *Education Forum 1946-50*.

The New Brunswick Education Forum is a document that is filled with how education is changing throughout New Brunswick, important events that have taken place and updates on the teachers and students throughout the province.

- b. Secondary Resources: The secondary source literature consulted in this study were as follows:

The People History Where People Memories and History Join . (n.d.). *The People History*. Retrieved November 1, 2010, from 1940's: News, Events, Technology, Prices and Popular Culture: <http://www.thepeoplehistory.com/1940s.html>

This website has important pieces of information throughout the entire decade, post war information, cultural trends and how much popular things cost.

Bélanger, C. (n.d.). *Newfoundland History*. Retrieved November 1, 2010, from Marianopolis College: <http://faculty.marianopolis.edu/c.belanger/nfldhistory/index.html>

Canadian Broadcasting Corporation. (n.d.). *CBC Digital Archives*. Retrieved November 1, 2010, from Federal Politics: http://archives.cbc.ca/politics/federal_politics/topics/206-1031/

UNA-Canada. (n.d.). *Canada's Role in the UN*. Retrieved November 1, 2010, from UNA-Canada Fact Sheets : http://www.unac.org/en/link_learn/fact_sheets/role.asp

These websites provided general information about the history of Canada as a whole, especially since the ending of World War II.

- c. Images and Media: The images and media examined and reproduced in this study came from the following resources:

The New Brunswick Education Forum. (1946-1950). *Education Forum 1946-50*.

Several images were taken from the Education forum that are relevant to the data that is presented such as: pictures of school buildings, maps of school improvements and the first education class of UNB.

Teaching and Learning Resources in Science Education (1941-1950):

Throughout this decade there were many improvements that took place in the learning and teaching resources that were offered to the students of New Brunswick. Science was one of the biggest areas that the Education Minister focused on throughout this decade to bring improvements to. This is why in 1946 it was published in the New Brunswick Education Forum that science kits were going to be offered to small high schools throughout the province.

The Department of Education realizing the fact that many small High Schools are not provided with Science Laboratories, or Science Materials has made available demonstration equipment on several important topics on the High School Course (The New Brunswick Education Forum February-March, 1946).

According to this publication the science kits were available for the Physics and Chemistry curriculums and they contained the materials and supplies that were needed to produce many of the lab experiments. However, the teachers could not take them out for the full school year so they had to program their classes around the 2-3 weeks that the kits were lent to them.

Curriculum:

Teaching and Learning Resources in Science Education (1941-1950):

Using the curriculum documents from 1941 to 1942, 1944 to 1945 and 1949 to 1950, the Outline of Programme of Study for High Schools or the Outline of Courses of Study for Public Schools are compared, specifically focusing on a comparative analysis of Physics, Physiology and Chemistry Education in Grade X and Grade XI. Using Grade X and Grade XI as a framework for analysis, the textbooks, topics and suggested experiments are evaluated. Due to a lack of primary and secondary sources available for review and comparative analysis for primary science education, the focus of this review will be conducted on secondary science education.

During the period from 1941-1950, science was divided into 3 components from grades IX to XI. The three divisions of science were divided into the subjects of Physics, Chemistry and Physiology and Hygiene, or Health. Although Physics and Chemistry remained relatively consistent throughout the decade the study of biology, as we label it today, was accounted for in various subjects entitled Physiology and Hygiene, or Health.

Although text books are suggested and available during the era of study, the Board of Education noted, “The attention of teachers is particularly directed to the fact that the texts themselves do not constitute courses” (New Brunswick Department of Education, 1949-1950). Even though textbook recommendations were provided throughout the documents evaluated, the Outlines of Courses of Study for Public Schools provided a detailed list of topics to cover, including a brief definition of description of the topic and was accompanied by a list of required experiments. Further statements regarding textbooks state, “Using the text-book merely as a reading book is not intended and will not produce the results aimed at” (New Brunswick Department of Education, 1944-1945). Based on these statements, it is evident that the subject of study was not defined or limited by a text, rather, if a textbook was prescribed it added to the context of the subject instead of dictating the content of study.

While textbooks were not a focus of study during the research, reviewing the suggested textbooks per during the era provides insight to the static and changing dimensions of science education. A list of Text books per subject matter are listed below:

Suggested Texts for Physics Grade X and XI:

1941-1942 – Elementary Practical Physics; or New Elementary Physics.

1944-1945 – Elementary Practical Physics; or New Elementary Physics; or Elements of Physics.

1949-1950 - Elementary Practical Physics; or New Elementary Physics; or Visualized Physics.

Suggested Texts for Chemistry Grade X and XI:

1941-1942 – Dominion High School Chemistry; or New Practical Chemistry

1944-1945 – Dominion High School Chemistry; or New Practical Chemistry

1949-1950 - Dominion High School Chemistry; or New Practical Chemistry

Physiology, Physiology and Hygiene, or Health Grade X:

1941-1942 – (subject titled ‘Health’) Health and Human Welfare

1944-1945 - (subject titled ‘Health’) Health and Human Welfare

1949-1950 – (subject titled ‘Physiology and Hygiene’) Health and Human Welfare

Physics Education:

Physics as a subject was studied in grades X and XI. The topics covered included Mechanics, Heat, Sound, Light, Static Electricity, Magnetism and Current Electricity. In addition to the study of physics, experiments were conducted through demonstration, or as stated in the

Programme of Study documents, by the individual student. A minimum of twenty experiments were required to be conducted throughout the year. These experiments included, but not limited to, experiments involving measurement, in which a student as required to observe the density of a solid by direct measurement. Other studies included Charles Law in relation to the study of Heat, or the study of Sound through the experimentation of Wave Lengths through a Renousance Tube.

Overall, the physics curriculum remained consistent in its evaluation of topics and suggested experiments. Some notable changes though did occur though. In the documents from 1941 to 1942, under the study of Heat, the methods for transmission of heat are discussed; however, in the documents from 1944 to 1945 and 1949 to 1950 the transmission of heat is not discussed. Additionally, in the document from 1941 to 1942, Magnetism was not a topic of study. Introduced in the Outline of Courses of Study for Public Schools document in 1944 to 1945 and continued through to the 1949 to 1950 documents, Magnetism was sustained as a topic of study in the subject of Physics.

Chemistry Education:

Similar to Physics Education, the study of Chemistry was conducted in grades X and XI. Topics covered in the subject of Chemistry during this period were extensive, but included; Oxygen, Hydrogen, Water, Hydrogen Peroxide, Solutions, Carbon, Carbon Dioxide, Carbon Monoxide, Calcium Carbonate, Calcium Oxide, Calcium Hydroxide, Sodium and Sodium Hydroxide (Chlorine and Hydrochloric Acid), Acids, Bases and Salts, Sulphur and its Compounds, Nitrogen and its Compounds, The Halogen Family, Sodium Carbonate and Sodium Bicarbonate, Sodium and Potassium Nitrate, Calcium Phosphate, Liquid and Gaseous Fuels, Ethyl and Methyl Alcohol, and the Carbohydrates.

Unlike Physics where a required number of experiments are required to be conducted, the aim of Chemistry was to emphasize patience and a concentrated effort in the applications and experiments in chemistry. In order to instill an interest in the subject of Chemistry, teachers were advised to emphasize “the applications of chemistry to the affairs of everyday life – industry, agriculture, and the home – and to the resources f this province, such as petroleum, salt, natural gas, gypsum, coal, and antimony (New Brunswick Department of Education, 1944-1945).

Physiology and Hygiene, or Health:

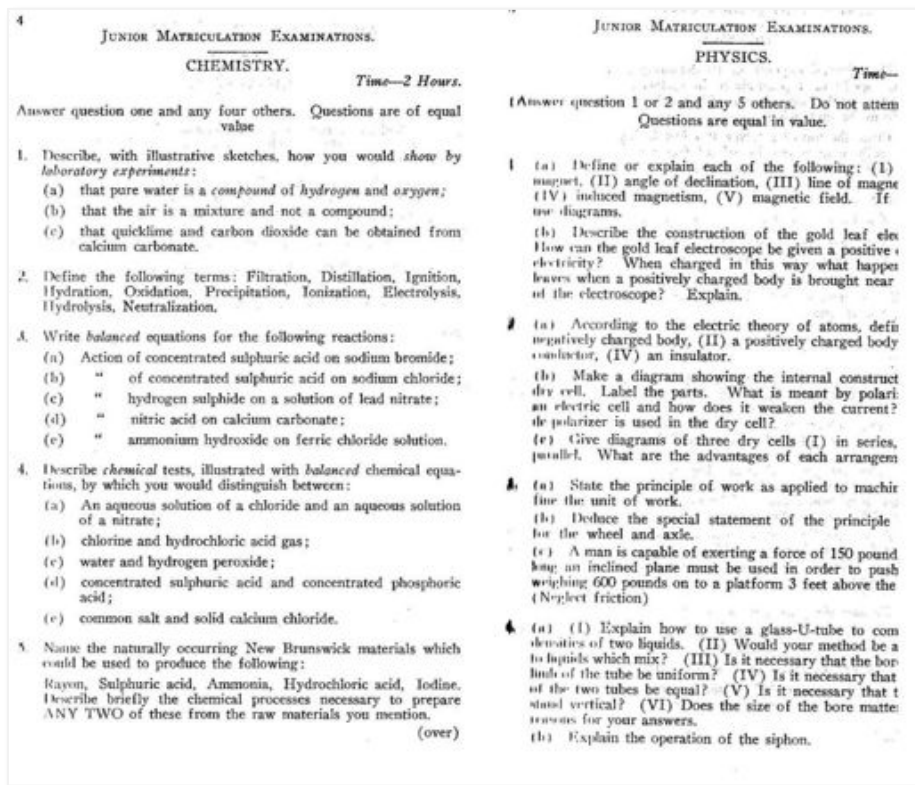
Aside from the suggested texts, the study of Physiology and Hygiene, or Health is not covered in the Outline of Programme of Study for High Schools. Even though the documents containing courses and subject matter do not contain information of the study of Physiology and Hygiene, or

Health, the Junior Matriculation Examinations contain questions such as how Hippocrates contributed to human welfare, or explain reflex action and draw a diagram.

Examinations:

Junior Matriculation Examinations were administered to students in the summer, following Grade XI. Students pursuing further education at the University of New Brunswick were required to write these examinations in order to qualify for admission. Junior Matriculation Examinations evaluated subjects such as; Latin, Mathematics, History, English, Greek or French, Chemistry and Physics. In order to gain admission as an undergraduate, a student was required to complete all the subjects noted in order to gain admission as an Arts student or all the prior mentioned subjects other than Latin to enroll as a Science degree. Within the Junior Matriculations Exams, candidates had to complete five compulsory and three optional subjects. The compulsory subjects were, English Language, English Literature, Algebra, Geometry and

History. The optional subjects included Latin, Greek, French, Chemistry, Physics, Arithmetic, and Physiology. It is noted though, that of the three optional subjects, one of the subjects required to be completed was Physics or Chemistry. On the left are copies of both the Chemistry and Physics Junior Matriculation Examinations (New Brunswick Department of Education, 1944).

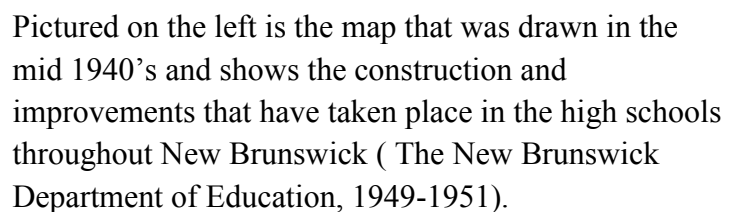


Education Progress:

The purpose of the Rural Schools Assistance Act of 1943 was to replace adequate and inadequate structures with modern buildings, equipment and surroundings, which would promote and safeguard the physical and mental health of our children (The New Brunswick Education Forum May 1950).

Between 1943 and 1950 the provincial government made the following changes and assisted in building:

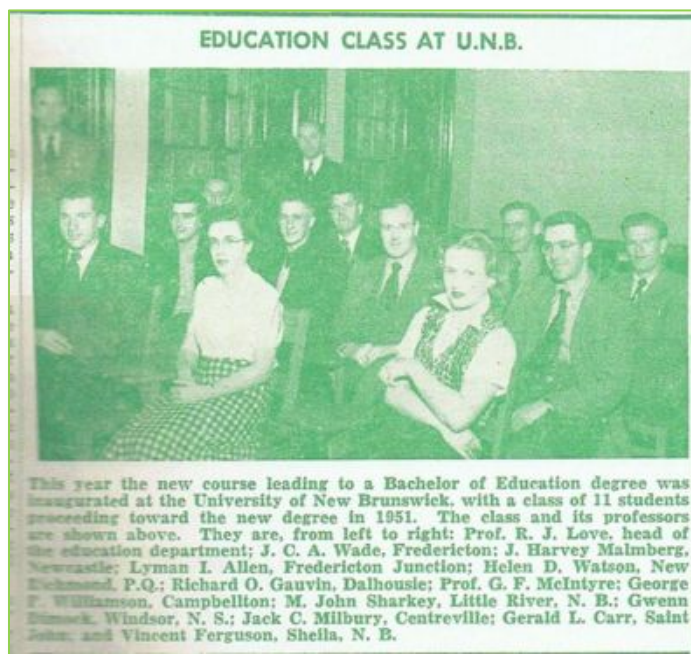
- 71- 1 room schools
- 42-2 room schools
- 5- 3 room schools
- 41- 4 room schools
- 2-6 room schools
- 11-8 room schools
- 2- 10 room schools
- 55 rooms added to existing schools
- 28 schools added sanitary facilities
- 24 schools added a basement and furnace
- 131 schools installed electric writing



In connection with the growth and improvements of the school buildings there was also an improvement in the school population, during the same period of time

enrolment of students increased by 11,888 (The New Brunswick Education Forum, May 1950).

Between 1946 and 1949 there was one particular school that went through two separate changes. Barkers Point School in York County was just a small bleak building with only one room in 1946, with the society growing the school needed to too. Pictured to the right, is the demonstration of how this building started with one room in 1946, grew to a brick building with four classrooms in 1947 and continuing its improvements in 1949, two more classrooms were added (The New Brunswick Department of Education, 1949-1951). All of these changes were needed because of the increasing amount of students that were going to attend this school.



Although most of the changes in the New Brunswick Education Forum were focused on the elementary and high school sections of the education system, there was an interesting fact connected to the University of New Brunswick. Between 1949 and 1950, the forum stated that UNB had developed their first Bachelor of Education Program. Although it was not a big class (comprised of eleven students from all parts of New Brunswick, Nova Scotia and Quebec), the course was deemed as popular and the education courses were beginning to be greatly emphasized. Similar to the program offered currently at the

University, “the Bachelor of Education degree is given following one year of study at the provincial university to students who already hold a B. A. or B. Sc. from a recognized university or college” (The New Brunswick Education Forum 1949). The first Bachelor of Education graduating class is pictured on the left (The New Brunswick Education Forum, May 1950).

Statistics:

According to the Education Reports of New Brunswick for 1942-1945 it was evident that the school population for grade level dropped significantly throughout each county as the student increased in grade. For example the school enrolment of Kent County was 1186 in grade one, but dropped for the same county to 25 students in grade 11. Throughout each county the pattern stayed the same, as a significant number of pupils did not enrol as they moved up in the grade level (Education Report 1942, Pg. 26-27)

Teacher's salaries increased by \$52 000 since 1944, duties and responsibilities also increased because of new course, modern equipment and compulsory attendance (Education Report 1946, Pg. 91). Before this time period it was not absolutely compulsory for enrolled students to actually attend school, this changed in the 1942 time period.

Possible Change of Perspective:

In 1942, the Programme of Studies for New Brunswick Schools stated, "The use of only one authorized text-book in most subjects is to be discourage. By class discussion and reports, the various topics will be dealt with in a more satisfying manner than is possible by the mere study of a few paragraphs in an authorized text-book" (Blakeny, 1942, p. 14). In the annual report of the department of education of the Province of New Brunswick for the School Year Ended 1949, the Chief Superintendent of Education submitted the ninety-eighth annual report. In this report, Dr. F. E. MacDiarmid was the successor to Dr. Fletcher Peacock, following Dr. Peacock's death the previous year. Within the report, a section entitled "Texts Recommended in the Several Subject are as Follows...", the section continues to list the various texts by name and subject. Furthermore, within the same report the School Book Branch – the branch within the Department of Education responsible for distributing books and pamphlets – reported a total of 350,818 books and 20,505 pamphlet distributions. Therefore in the year of 1949, the total expenditure for textbooks was \$224,379.86, an increase of \$4,668.14 from the previous year (The New Brunswick Department of Education, 1949-1951).

Between 1941 and 1948 the Outlines of Courses of Study for Public Schools provided a detailed subject overview which included topics for review, suggested assignments and required experiments. In addition the content, teacher resources were provided. Based on this information, it can be inferred that text books were not viewed as a necessity, moreover, that textbooks may hinder the teaching and learning process. "More and more, however, teachers are coming to realize that education is not only an acquisition of facts, but a process of growth to be directed toward the main objective. The attitudes taken, the habits formed, and the ideals embraced are really more important in the ultimate outcome than the quantity of knowledge acquired, though undoubtedly the acquisition of the latter will materially help to determine the former" (Blakeny,

1942, p. 10). Based on the Annual Report by the Chief Superintendent of Education in 1949, the use of textbooks seemed to increase, although it is unclear whether this increase was due to an increase in population or a change of perspective.

Broader Social and Scientific Context (1941-1950):

In New Brunswick and Canada:

Following the Second World War many changes were brought to the Country of Canada, some that are still followed today.

The Second World War brought many changes to the country of Canada as a whole; the government was centralized throughout the war and remained so afterwards. The federal government began to produce policies for the people of the country such as: social welfare and the baby bonus (to encourage women to leave the work force and return to the home) (Canadian Broadcasting Corporation).

Following the war, in 1949 another province entered the country, The Dominion of Newfoundland held an election in this year to decide whether Newfoundland was going to remain independent or not (Bélanger).

One of the major events that happened in this decade for Canada was that “Canada was one of the founding members of the United Nations in 1945, and also of the North Atlantic Treaty Organization (NATO) in 1949 (UNA-Canada).

In World:

During the 1940's there were many significant events that happened throughout the world, such as:

- The first nuclear bomb was created, which dramatically changed the war and international relationships.
- The war continued to dominate the world affairs in 1941 and thereafter.
- Following the end of the Second World War in the later part of the 1940's, marked the beginning of the Cold War.
- Pakistan and India gained independence from the UK.
- After achieving the independence of his country in 1948, on January 30th of the same year, Gandhi was shot dead.

Interesting Facts in this decade:

- The average cost of a new home in 1949 was 7, 450.00 which was a significant increase from the early 1940's when it was 3, 920.00.
- In 1940 the average cost for a gallon of gas was 11 cents; in 1949 it had risen to 17 cents per gallon.
- An entire men's suit was priced as low as \$24.50.
- A Sealy Mattress cost \$38.00.
- The average cost of a new car in the early 1940's was \$850.00 and in 1949 it was 1,420.00 (The People History Where People Memories and History Join).

Relation or Significance of Study for Education in New Brunswick Today:

Although the scientific world has seen many significant discoveries since the 1950's, the curriculum documents cover many of the same topics covered in current Physics, Chemistry and Biology classes today. Comparing the Program of Study documents to the curriculum documents developed today, the delivery of curriculum from 1941 to 1950 was not based on textbook content, instead, based on the Outline of Programme of Study for High Schools provided by the Board of Education and administered by teachers.

Through the introduction of the Bachelor of Education at UNB, the face of education has changed. The implementation of this structure ensured teachers were provided with standard training and equipped to provide instruction within schools.

In this decade there were advancements in the science tools that were available to both the teachers and students in New Brunswick. These advancements can be closely linked to the development of the NB3 21C initiative that New Brunswick is now using not only with its science courses but the courses as a whole. In the past decade, the science advancements were made because of the changes within the province, such as the increase of population. Today, there are changes because of both, the population needs and technological needs. With the changes that happen in society as a whole, in a country or in a particular province brings with it changes to the educational system and the classroom.

Conclusions:

Science Education from 1941-1950 had multiple formal Science resources; however, the curriculum documents contained a vast amount of information. Therefore the suggested textbook resources could be omitted in any given science course of study. Using the curriculum documents alone, the breadth of science education was obtained from the "Outline of Courses of

Study for Public Schools” documents. This model is notably different from the delivery of the curriculum today. Through this research, we have seen a swinging of the pendulum from one side to the other.