

Science Education in New Brunswick

1951-1960



Source: New Brunswick Forum of Education. 1955.

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Hypothesis

Life changed as people knew it throughout the 1950's. In New Brunswick, increased population, and therefore increased enrollment in both rural and regional schools, led to more classrooms, more teachers, and the construction of additional schools. It is our belief that due to the increasing number of schools and qualified teachers, more attention was put on the curriculum, and how it could be improved in relation to the ever changing world.

Discussion of Sources

Primary Sources:

At the University of New Brunswick Archives, we explored:

- Department of Education. (1950). *Department of education annual report 1950-1951*.
- Department of Education. (1951). *Department of education annual report 1951-1952*.
- Department of Education. (1952). *Department of education annual report 1952-1953*.
- Department of Education. (1953). *Department of education annual report 1954-1955*.
- Department of Education. (1951). *Department of education annual report 1959-1960*.
 - The Annual Reports allowed us to discover the schools built throughout this decade, schools that became consolidated, and student enrolment.
- The Forum of New Brunswick Education (1949-1960).
 - These forums showed us what was going on in Education throughout the province of New Brunswick during our decade. Useful information included much discussion regarding several curriculum documents, including science.
- The Government of the Province of New Brunswick. (1952). *Programme of Studies for New Brunswick schools grade I-VI*. Saint John, N.B.
- The Government of the Province of New Brunswick. (1955). *Programme of Studies for New Brunswick schools grade I-VI*. Saint John, N.B.
- The Government of the Province of New Brunswick. (1958). *Programme of Studies for New Brunswick schools grade I-VI*. Saint John, N.B.
 - These programme of studies documents allowed us to explore what type of science material was being taught to elementary students in the 1950's. We looking at the beginning, middle and end of the decade.

- New Brunswick Department of Education. (1949). *Outline of programme of studies for high schools 1949-1950*.
- New Brunswick Department of Education. (1950). *Outline of programme of studies for high schools 1950-1951*.
- New Brunswick Department of Education. (1952). *Outline of programme of studies for high schools 1952-1953*.
- New Brunswick Department of Education. (1954). *Outline of programme of studies for high schools 1954-1955*.
- New Brunswick Department of Education. (1956). *Outline of programme of studies for high schools 1956-1957*.
- New Brunswick Department of Education. (1959). *Outline of programme of studies for high schools 1959-1960*.
 - These outlines helped us explore what science material was being taught to high school students throughout the 1950's.

Secondary Sources:

- Faculty of Education. (n/d). *High school science education in Atlantic Canada in historical perspective*. Retrieved October 20, 2010, from <http://www.unbf.ca/education/scienceatlcac.html>
 - This link gave us a brief overview about science education in Atlantic Canada.
- Rosenberg, J. (n/d). *1950's timeline*. Retrieved November 10, 2010, from <http://history1900s.about.com/od/timelines/tp/1950timeline.htm/>
- *1950s*. (2010) Retrieved November 10, 2010, from <http://en.wikipedia.org/wiki/1950s>
 - These sources allowed us to explore the 1950s, and discover any main events.
- *DNA*. (2010). Retrieved November 10, 2010, from http://en.wikipedia.org/wiki/DNA#History_of_DNA_research
- *Korean War*. (2010). Retrieved November 10, 2010, from http://en.wikipedia.org/wiki/Korean_War
- NASA History Program Office. (2010). *History home*. Retrieved November 11, 2010, from <http://history.nasa.gov/>
- *National defence education act*. (2010). Retrieved November 10, 2010, from http://en.wikipedia.org/wiki/National_Defense_Education_Act
- *Population of Canada by year*. (2010). Retrieved November 10, 2010, from http://en.wikipedia.org/wiki/Population_of_Canada_by_yea

- *Red scare*. (2010). Retrieved November 20, 2010, from http://en.wikipedia.org/wiki/Red_Scare
- *Sputnik crisis*. (2010). Retrieved November 10, 2010, http://en.wikipedia.org/wiki/Sputnik_crisis
- *Teller-Ulam design*. (2010). Retrieved November 10, 2010, from http://en.wikipedia.org/wiki/Teller%E2%80%93Ulam_design
 - Each of these sources were used to explore the particular event we were looking at that occurred in the 1950s.
- Miller, J. R. (2010) "Residential Schools". The Canadian Encyclopaedia. Retrieved November 10, 2010, from <http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=A1ART0011547>
- *History and geography of residential schools: 1950-1959*. (2009). Retrieved November 10, 2010, from <http://www.wherearethekids.ca/en/map/timeline/1950-1959/>
- Jondreville, L. and Chang, L. (n/d). Residential schools timeline. Retrieved November 10, 2010, from <http://www.uccpeople.com/1writings/residentialtime.htm>
 - These sources were used as we researched residential schools in the 1950s.

Media Sources:

- *Harvey Past*. (2010). Retrieved November 10, from <http://www.village.harvey-station.nb.ca/>
- Mitchel, D.P. (2003). *Venus, soviet space history, computer graphics, science, etc*. Retrieved on November 10, 2010, from www.mentallandscape.com/
- *The Butterfly Catcher*. (n/d). Retrieved on November 10, 2010, from <http://pippastephens.wordpress.com/>
- The Forum of New Brunswick Education (1958).
- The Forum of New Brunswick Education (1955).
- The Government of the Province of New Brunswick. (1958). *Programme of Studies for New Brunswick schools grade I-VI*. Saint John, N.B

Context of Education in New Brunswick Education in 1950's

In 1951, the population of New Brunswick was 515, 697, which was 12.7% higher than ten years earlier (Department of Education 1951). The increased population led to an increased enrolment in schools, and therefore the requirement to build multiple new schools throughout the 1950's. Each year, several projects were undertaken to develop schools already



Harvey School, Harvey, New Brunswick.
Source: <http://www.village.harvey-station.nb.ca/>.

existing, as well as the construction of new ones. Examples of projects that took place throughout the 50's included: installing furnace systems, adding classrooms, installation of sanitary facilities, and adding electric wiring (Department of Education 1952). Many schools were built in rural areas, which benefited those who had a difficult time travelling long distance to school. Schools needed to be within walking distance, because that is how many of them got to school. Because of the large rural population, the construction of these elementary and high schools throughout the 1950's would eventually have a major impact on the quality of science education in New Brunswick (Faculty of Education nd). In the school years from 1950-1952 alone, 11 new schools were erected (Department of Education 1952).

Not only were rural schools being built throughout this decade, but schools were also becoming consolidated, meaning, small schools were uniting into much larger schools. Consolidated schools were thought to give students a better education, due to better curriculums, and usually better facilities. In regards to science, a consolidated school was more likely to have facilities such as a science laboratory. According to the Department of Education's Annual Report (1952), as of 1952, 36 regional schools had been consolidated. While consolidated schools gave students a chance to a better education, transportation costs sky-rocketed (Department of Education 1953). This is because buses were now being used to transport children, and these buses were often required to travel long distance. To get to school, students walked, were transported by bus, some took horse and buggy, and in one particular case, even a boat.

Residential Schools in the 1950s

Up until the 1950s native residential schools were run on a half-day system (Miller 2010). The half-day system involved having the students do school work for half of the day and then perform manual work for the remainder of the day (Miller 2010). This was done with the intent of running the schools less expensively, and was justified by arguing that it provided the students with vocational training. In 1951 the half-day system was eliminated due in large part to increases in funding to the residential schools (Miller 2010). Also, in 1951 first nations students began to attend secular day schools (History and Geography of Residential Schools 2009). However, many native students still continued to attend residential schools (History and Geography of Residential Schools 2009). In 1956 the Canadian government began to take the input of parents into consideration when making decisions pertaining to education within the residential school (Jondreville and Lee, n/d). In 1958 recommendations were made by Indian Affairs officials, for the abolition of residential schools (History and Geography of Residential Schools 2009). Throughout the 1950s many parents and first nations leaders complained about the conditions of the residential schools, however these complaints were largely ignored by the government (Miller 2010).



Handwritten text in a cursive script, likely in French, is visible in the lower right portion of the page. The text is faint and appears to be a transcription or a copy of a document. The visible text includes phrases such as "Monsieur le Ministre", "Monsieur le Secrétaire", "Monsieur le Directeur", "Monsieur le Chef de Service", "Monsieur le Chef de Bureau", "Monsieur le Chef de Section", "Monsieur le Chef de Division", "Monsieur le Chef de Sous-Division", "Monsieur le Chef de Service", "Monsieur le Chef de Bureau", "Monsieur le Chef de Section", "Monsieur le Chef de Division", "Monsieur le Chef de Sous-Division".

Teaching and Learning Resources in Science Education

In the 1950's, grades I-VI had a science curriculum called "Natural Science". When arriving in grade VII-IX, students took a science course called "General Science". High school science curriculums were broken down into Chemistry and Physics. In the 1952-1953 school year, Biology was introduced as an option in grade XII (New Brunswick Department of Education 1952).

Even at the beginning of the 1950's it was understood that no two groups of students are the same especially when one group is from an urban area and one group is from a rural area. The 1952 Natural Science curriculum document mentions that "it is not expected that the teacher will deal with every topic suggested in this course".

Elementary

The general aims for natural science in the elementary grades in the years 1952-1955 included: giving child experience with nature, careful observation and to develop the power to reason scientifically (The Government of the Province of New Brunswick 1952; 1955). By 1958, the curriculum for Science changed in for elementary schools in New Brunswick, and therefore the number of aims also changed. The new aims from the 1958 and 1959 programme of studies included: (1) To impart some knowledge of familiar natural phenomena, both biological and physical; (2) To foster an understanding and appreciation of nature; (3) To develop the child's powers of observation; (4) To indicate in a simple way the interdependence of men, animals and their dependence on physical conditions; (5) To encourage a humane attitude toward living things and to counteract any inclination toward wilful destruction, ultimately to develop a realization of the need for conserving exhaustible resources including soil and power resources; (6) to provide a valuable leisure-time interest (The Government of the Province of New Brunswick 1958).

The "Natural Science" curriculum for 1952 states that in early grades, I and II, students "should come in contact with a great number of things, but their contacts should be general" (The Government of the Province of New Brunswick 1952). It was the teacher's responsibility to introduce several aspects of science to the children, but the students were not responsible for critical thinking. The aim was to peak the child's interest in science. The curriculum states that the "out-of-doors" should be the laboratory. So much emphasis was placed on fieldtrips, which included walks through parks, gardens, fields and so on. Suggestions for the teacher included fairs which displayed their work, vegetables, or flowers students raised, or anything else done in class.



*Elementary students weighing rats while learning about nutrition.
Source: New Brunswick Forum of Education. 1958.*

In 1952, the grades I and II curriculum was broken down into: (1) Plant Life, (2) Animal Bird and Insect Life, (3) Information regarding the season the students were in.. Plant Life, and Animal Bird and Insect Life were taught in the fall, relating to fall themes, in the winter, relating to winter themes, and in the spring, relating to spring themes. Under Plant Life, topics discussed included: flowers, trees, seeds, leaves, crops, pussy willows, swelling buds, sap, work in the garden, and weeds. Under Animal, Bird and

Insect life, topics discussed were: grasshoppers, crickets, spiders, worms, caterpillars, birds, fur, animals and their tracks, the rabbit, the bear, farm animals, pets, fish, bird songs, frogs, and birds' nests. In regards to seasons, the teacher would discuss frost, fall work on the farm, snow, ice, how the compass works, the moon, stars, sunlight, rainbows and rainclouds (The Government of the Province of New Brunswick 1952).

The curriculums for students in grades III were also Plant Life, Animal, Bird and Insect Life as well as information regarding the seasons. Under Plant Life, topics included: Fall leaves and colours, familiar garden flowers, main parts of plants, effects of forest fires, pussy willows, swelling buds, new leaves, picking flowers, and farming. Under Animal, Insect and Bird Life, topics included: How animals prepare for winter, names of common winter birds, caterpillars, migrating birds, and bird songs, cocoons, toads and earthworms. Students were also taught about the different seasons. Other topics discussed in the winter term were: moon phases, thermometers, evergreens and Christmas, and water forms (The Government of the Province of New Brunswick 1952).

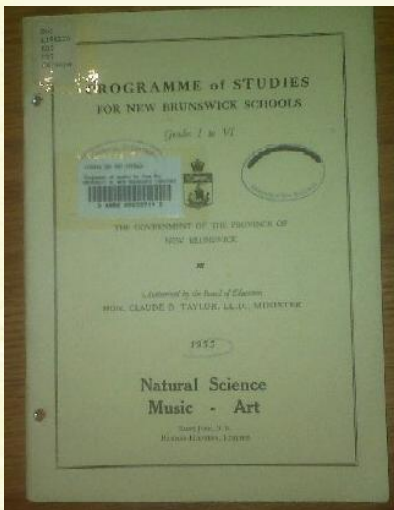
The curriculum for grade IV also included Plant Life, Animal, Bird, and Insect Life, along with seasonal topics. Under Plant life, topics included: Late blossoms, parts of plants used for food, how trees and shrubs prepare for winter, recognition of common trees, early flowers, buds, preparation of soil for planting, and sowing seeds. Under Animal, Bird and Insect Life, topics included: How animals prepare for winter, insects, domestic animals, tadpoles, frogs, toads, birds, nests and eggs. When discussing weather

teacher dealt with the shorter versus longer days, frost, ice, and snow. Other topics discussed in the winter term included: Ventilation, heating of homes and school, the sun and moon, solids, liquids and gases (The Government of the Province of New Brunswick 1952).

The curriculum for grade V also included Plant Life, Animal, ~~Bird~~, and Insect Life, along with seasonal topics. Under Plant life, topics included: seeds, tree identification, nuts, perennials, preparation of bulbs for winter and spring blooming, preparation of gardens for winter, early spring flowers, planting trees, and Arbour Day. Topics under Animal, Bird and Insect life included: Diversity of the forms of life, how birds prepare for winter, fur-bearing animals, butterflies, returning birds, wild geese, and the value of birds. Again, students were taught about the different seasons, learning things such as the effects of frost on soil, fire, dew and weather. Other topics included in the winter semester included: air in the room, fire, the magnet, simple electricity, evergreens and stars (The Government of the Province of New Brunswick 1952).

Last but not least, the grade VI curriculum followed the same structure as the grade V curriculum. Under Plant Life, topics included: autumn leaves, sea weed, flowers and seeds, structure of fruit, crops and storage, kinds of soil, weeds, conditions of plant growth, germination of seeds, plant functions, spring flowers, trees and conservation of moisture, and gardening activities. Under Animal, Bird and Insect Life, topics included: Toads and frogs, hunting season, food of birds, life story of insects, winter birds, fish,

more bird recognition, and nests of injurious insects. Other topics studied in the winter term included: Stars and planets, the aurora borealis, fire, wool, cotton, linen, leather, simple lever and the formation of rocks. A book available to students in 1952-1953 for the "Natural Science" curriculum was called "New Pathways in Science" (Craig et. al.) Ginn & Co. (The Government of the Province of New Brunswick 1952).



*Natural Science Programme of Studies for New Brunswick Schools, 1955.
Source: University of New Brunswick Archives.*

After looking at the curriculum from 1955, it is not evident that there was any change. Between 1955 and 1958, the science curriculum for grades I-VI changes dramatically. No longer was the curriculum broken down into Plant Life, followed by Animal, Bird and Insect Life. Instead, categories included: Living Things – The Biological Phases of the Child's Natural Environment, The Physical Phase of the Child's Natural Environment and finally, Science Applications In Our Lives – Man and

His Environment. The curriculum was split up into an A and B year in rural schools. The A year followed curriculum A, and the B year followed curriculum B. This was to accommodate classes containing two grades, rather than just one (The Government of the Province of New Brunswick 1958).

For the A year, in grade I-II, topics under Living Things included: Needs (animals and their homes, plants and air, water, warmth, sunlight, soil, food, how plants and animals need our protection and care), distribution (where animals live), adaptations (the way animals move about, taking care of young, animal protection, acquisition of food, trees and losing leaves, trees protected by bad taste), and growth (animal growth and plant growth). Under The Physical Phase of the Child's Natural Environment, topics included: the earth (land, water, air, rocks, soil, earth's surface, water of the earth, and weather), the sky above (sun, clouds, shadows, the sun and heat, and stars), and finally, matter, energy and machines (magnets and magnetism). Under the topic of Science Applications In Our Lives – Man and His Environment, topics included: Man's use of earth's products, man's control over living things, and health. The grade III-IV curriculum followed the same pattern as the grade I-II curriculum, only that the teachers went into greater depth in each category. Under Matter energy and machines, topics furthered, adding heat, matter and sound. The grade V-VI curriculum also followed the same pattern, but added more topics. Under Living Things, how plants and animals can be improved was an added topic. The amount of information required definitely increased as the students got older (The Government of the Province of New Brunswick 1952).

For the B year, in grade I-II, topics under Living Things included: Structure (of both animals and plants), response to stimuli, how plants and animals obtain food, reproduction, and interdependence. Under the Physical Phase of the Child's Natural Environment, topics included: The earth (air, water, rocks and minerals), the sky above (stars), and matter, energy and machines (light, gravity). Under Man's Control of his Environment, topics included: man's use of energy, safety, and conservation. The grade III-IV curriculum followed the same pattern as the grade I-II curriculum, but again, the teachers went into greater depth in each category. Under The Physical Phase of the Child's Natural Environment, topics furthered, adding changes in matter. Also, electricity was added under matter, energy and machines. The grade V-VI curriculum, followed the same pattern as the previous years. Under the sky above, students were also required to learn about the solar system. The required amount of information to be relayed to the children was a lot higher in the later grades than early elementary (The Government of the Province of New Brunswick 1952).

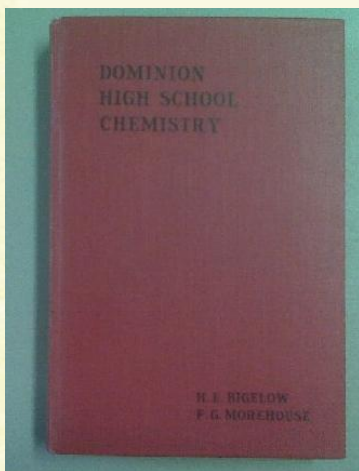
High school

In the 1950's science was broken down into Chemistry, Physics, and Biology. In Grade 9, the text used for the science curriculum was "Science Experiences" MacDiarmid and Sansom (New Brunswick Department of Education 1950).

Grade 10 and 11 students were required to take Physics. For grade 10 students, the text books used were "Elementary Practical Physics" Black and Davis-Macmillan, "New Elementary Physics" Millikan, Gale, Coyle – Ginn and Co or "Visualized Physics", Oxford Book Co. Topics discussed throughout the school year included: Mechanics (fluids, pressure, Pascal's law, buoyancy, weight and density of air, Boyles law), solids (definition of force, motion, energy and potential, simple machines, gravity), and heat. Students were required to do a minimum of 10 laboratory experiments.



High school students in Saint John with their new lab equipment.
Source: New Brunswick Forum of Education. 1955.



Source: School Days Museum,
Fredericton, New Brunswick.

When students reached grade 11, the text book used was the same text as grade 10, or they could also use "Visualized Physics", Taffel-Oxford Book Co. Grade 11 topics included: Heat, Sounds, Light, Magnetism and Electricity (New Brunswick Department of Education 1950). In the 1949-1950 school year, the Chemistry text was "Dominion High School Chemistry" – Bigelow and Morehouse, or, "New Practical Chemistry" – Black and Conant – Macmillan. Topics included: Learning resources of the province, such as petroleum, salt and natural gas, study of hydrogen and oxygen, decomposition, catalysts, oxidation, reduction, combustion, formulas and equations, conservation of mass, and Law of Definite proportions (New Brunswick Department of Education 1949). It was important for emphasis to be placed on things that affected everyday life, relating to industry, agriculture, and home life. In 1950-1951, there was no chemistry prescribed for grade XI students. Instead, students would finish the physics curriculum from the previous year (New Brunswick Department of Education 1950).

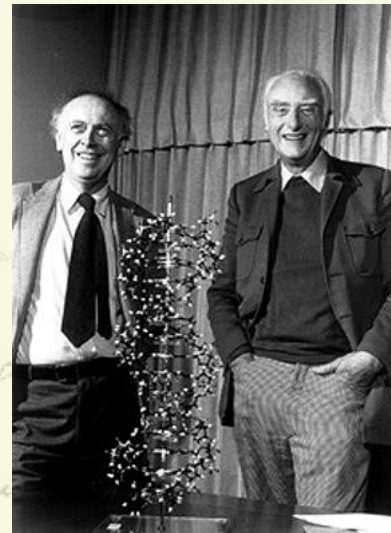
The school year of 1952-1953 was the first year that a grade XII curriculum was added to the education system in New Brunswick. With grade XII came the introduction of a new subject. In many schools, students now had to option to take Biology. The Biology text was “Adventures with animals and Plants”- Kroeber and Wolff, Copp Clark. Biology courses were only recommended to those schools with the proper facilities, and necessary equipment. In 1952-1953, another text book was added, called “Physics for the New Age”. Because grade XII was added, there was more time to do physics, so physics topics were discussed in grades X and XI, and more complex topics in grade XI. Chemistry was moved to grade XII, and another text book was added “Basic Chemistry”, Bayles and Mills (New Brunswick Department of Education 1952). By 1956, science film strips were not only available, but being used in schools in New Brunswick. These film strips became teachers aids when discussing science topics in class. The strips could be borrowed from “The Visual Aids Bureau” (New Brunswick Department of Education 1956). In 1959, the grade XII Chemistry course introduced a new text book called, “The Essentials of Chemistry in the Laboratory”. This was not a book for the students, but rather a teacher’s guide to teaching Chemistry (New Brunswick Department of Education 1959).

The Annual Report from 1959 states that the rapid advances being made in mathematics and science would continue to influence our school curriculum, but changes could not be undertaken unless teachers were prepared for them. We know that the curriculum changed, and by taking a sneak peek into the future, we know that curriculums continued to change throughout the decades following.

Broader Social and Scientific Context

The population of Canada at the beginning of the 1950’s 13, 712, 000, and by 1959, the population was 17, 483, 000. Several advances in science were made in the 1950’s all around the world (*Population of Canada by year*, n.d.).

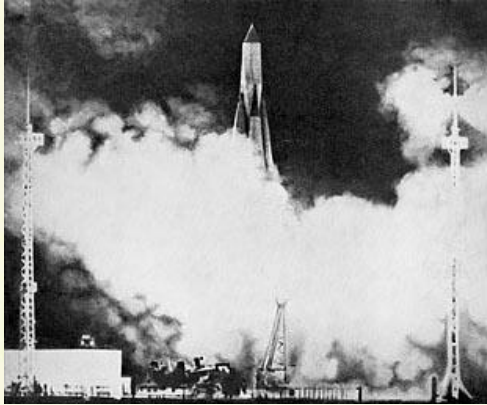
Prior to the 1950’s, research had been done regarding DNA. In 1953, James D. Watson and Francis Crick brought forward what we now accept as the double-helix model for DNA structure. Watson, Crick, and a man by the name of Maurice Wilkins received a Nobel Prize for their work. By 1957, Crick laid out the central dogma of molecular biology, explaining the relationship between DNA, RNA, and proteins (*DNA*, 2010).



James D. Watson and Francis Crick and their famous double-helix model.

Source: <http://pippastephens.wordpress.com/>

The 1950's consisted of clashing between communism and capitalism. Following World War II, there was an increased fear of communism, known as the second red scare. This took place at the end of the 1940's, and lasted until mid 1950's (1950s, 2010). The Korean War began in 1950, a war in which Canadian soldiers served. Hundreds of Canadians were killed in this war, and thousands of Americans. The war ended in 1953 (Korean War, 2010).



The launch of Sputnik 1. October 4, 1957
Source: www.mentallandscape.com/

In 1957, the Soviet Union launched Sputnik 1, which was the first artificial satellite to orbit the earth. This launch surprised the United States and led to the sputnik crisis (Sputnik crisis, 2010). Prior to this the US attempted to launch two satellites, both failed. Less than a year following the launch of Sputnik 1, US Congress passed the National Defense Education Act (NDEA), which was a four year program investing billions of dollars into US education. This law was motivated by the fact that US scientists were "falling behind" in science (National defence education act, 2010).

At the beginning of the 1950's, the US also conducted its first hydrogen bomb explosion test. The hydrogen bomb, known as the Teller-Ulam design was the first used multi-megaton-range thermonuclear weapon. Today, basically all nuclear weapons use this design (Teller-Ulam design, 2010).

Another great feat of the 50s decade was the inception of the National Aeronautics and Space Administration (NASA). NASA was founded in 1958. We know now that NASA would come to accomplish several scientific and technological achievements in both air and space (NASA History Program Office 2010).

Relation of Significance of the Study for Education in New Brunswick Today

"Methods in all branches of our societal organization are changing, and the programme in the schools must change to keep pace with that of a changing society" (The Department of Education 1954). This was a statement given by the superintendent of Education in New Brunswick. We know now that methods not only changed throughout the 1950's, but continued to change, and is completely different today than it was in the past.

Sometimes, it is important to go back to the basics. So often in our own education, especially when studying science, we find ourselves in classrooms with text books. Throughout the 50's, the outdoors was such an important part of their curriculum, particularly at the elementary level. When looking around, most teachers entering into the education work force are accompanied by arts Degrees. The only problem with this is the fact that many of these teachers will fear science, and will fear teaching a science curriculum.

Conclusions

As we reflect back on our hypothesis, we can in fact say that the science curriculum changed throughout the 1950's. Both in elementary and in high school, advances were made in the curriculum documents. Whether those changes be subtle, as in the high school documents, or dramatic, as in the elementary documents, things did change throughout this decade.



*Hidden down the
countryside - now save Coups
keep larks, size gardens
even even gables - It's a
hidden down point parlor*