THE USE OF THE TAXONOMY OF EDUCATIONAL OBJECTIVES: COGNITIVE DOMAIN WHEN ANALYZING AND COMPARING GEOGRAPHY OBJECTIVES AND QUESTIONS ON THE PUBLIC EXAMINATIONS FOR THE PROVINCE OF NEWFOUNDLAND

WILLIAM WAYNE MERCER

15021

THE USE OF THE TAXONOMY OF EDUCATIONAL OBJECTIVES: COGNITIVE DOMAIN WHEN ANALYZING AND COMPARING GEOGRAPHY OBJECTIVES AND QUESTIONS ON THE PUBLIC EXAMINATIONS FOR THE PROVINCE OF NEWFOUNDLAND

by

© William Wayne Mercer

A THESIS

SUBMITTED TO THE FACULTY OF EDUCATION IN

PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MASTER OF EDUCATION

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

JULY, 1972

ABSTRACT

The study examined whether or not there is a discrepancy, as identified by Bloom's Taxonomy of Educational Objectives: Cognitive Domain, between the objectives as stated in Newfoundland geography curriculum guides and those objectives tested on Public Examinations in Geography for Grades IX and X. Data for this study were derived from two sources: geography curriculum guides for Grades IX and X, and from the Grades IX and X Public Examinations in Geography that were administered between 1960-1969. A total of 739 test items and 319 curriculum guide objectives comprised the population used in this study and each was classified according to the six major levels of Bloom's taxonomy.

The assistance of three judges was also required in order to validate the researcher's competency in rating test items and curriculum guide objectives according to the six major levels of Bloom's taxonomy. These judges were selected from the replies to a circular sent to members in the Department of Curriculum and Instruction, Memorial University.

A preliminary investigation was undertaken by the researcher in order (i) to ascertain the judges familiarity with the research instrument, (ii) to validate the researcher's competence in using the Taxonomy of Educational Objectives: Cognitive Domain, and (iii) to determine if the taxonomy

could be used in classifying curriculum guide objectives.

This preliminary investigation made the researcher aware of the fact that curriculum guide objectives could not be classified according to Bloom's taxonomy unless they were stated in terms of actual pupil performance. As a result a behavioural interpretation was assigned to the curriculum guide objectives by the researcher and then validated with the assistance of Grade IX geography teachers in and around the environs of St. John's.

Having successfully overcome the problems presented in the preliminary investigation, the researcher conducted the pilot study. The purpose for conducting this pilot study was to solve the two sub-problems that had underlain the main problem of this study. A total of 104 randomly selected items--71 from the Public Examinations in Geography and 33 from the geography curriculum guides--were prepared as a questionnaire and submitted to the three judges for their independent classification. The results of this pilot study showed that Bloom's taxonomy was an effective instrument (i) in analyzing test items on Public Examinations in Geography for Grades IX and X, and (ii) in analyzing objectives stated in geography curriculum guides, provided the objectives were given an appropriate behavioural interpretation.

In the main study the relationship between objectives tested on the Public Examinations in Geography and those objectives outlined in the geography curriculum guides was investigated. The statistical procedure used to test the

main hypothesis and the six sub hypotheses was a Chi-square test of independence.

The findings indicated that there was a significant difference between the objectives outlined in the geography curriculum guides and those items tested on the Public Examinations in Geography for Grades IX and X.

Analysis of the findings supported several important conclusions: (1) There exists a gap between the objectives stated in geography curriculum guides and those objectives tested on the Public Examinations in Geography. (2) The Public Examinations in Geography emphasize the pupils ability to recall factual information that has been previously stated in the textbook.

Arising from the study were several major recommendations: (1) A future comparative study could be done comparing the Public Examinations with the examinations administered by teachers during the five year moratorium. (2) There exists a need for a study, investigating the actual teaching situations which test results are intended to reflect.

ACKNOWLEDGEMENTS

The writer wishes to acknowledge the valuable advice and guidance given throughout the course of this study by Dr. R. M. Anderson, Assistant Professor of Education, Memorial University of Newfoundland, the supervisor of this thesis. Thanks are also extended to Dr. R. K. Crocker, Assistant Professor of Education, Memorial University of Newfoundland, the other member of the thesis committee, and to Dr. W. J. Gushue, Professor and Head of the Department of Educational Foundations, Memorial University of Newfoundland, the external reader. A special word of thanks goes to Dr. G. Murphy, Professor and Head of the Department of Curriculum and Instruction, Memorial University of Newfoundland, for his interest and assistance from the outset of this study.

Appreciation is also expressed to the three judges--Miss H. P. Marr, Mr. M. Brewster, and Dr. R. K. Crocker--for their assistance in helping the researcher to validate this study, and for their many helpful comments and personal communications.

Finally, the writer wishes to express his appreciation to Mrs. P. Bennett for her tireless effort in typing the thesis.

W. W. M.

TO MY WIFE, CABRINI, FOR HER WILLINGNESS TO HELP WHEREVER NEEDED, AND WITHOUT WHOSE ENCOURAGEMENT, UNDERSTANDING AND PATIENCE THE COMPLETION OF THIS STUDY WOULD HAVE BEEN IMPOSSIBLE.

AND

TO MY PARENTS FOR THEIR INTEREST IN MY EDUCATION, WHICH WAS ONLY SURPASSED BY THEIR MANY SACRIFICES TO MAKE THAT EDUCATION POSSIBLE.

TABLE OF CONTENTS

LIST OF TABLES

Chapter 1

THE PROBLEM AND DEFINITION OF TERMS USED

THE PROBLEM

The students of today are living in a world of complex technology and ever-increasing knowledge. In fact, there has been a tremendous amount of technological progress made in a very short period of time. Such progress will continue to take place. As a result, few people would disagree with the statement that there exists a need for students to learn to think in a way that will allow them to function effectively in society. Critical thinking is just one of the many things that should be given a high priority on any list of educational objectives.

Even though there are individuals within Newfoundland's educational system who express an awareness of the changes taking place in our society, the Report of the Royal Commission on Education and Youth still points out that one of the major criticisms of Public Examinations in Newfoundland is that

> they have a narrowing effect on education in that they place too much emphasis on rote learning . . . . It has also been claimed that Public Examinations perpetuate the textbook approach to teaching by placing undue emphasis on the memorization of facts gleaned from textbooks (Warren, 1966, p. 184).

Public Examinations should determine to what extent the aims

of the curriculum are being achieved. Spencer (1970) conducted a study that investigated the relevance of questions set for the Grade IX Departmental Examinations in English Literature, June 1968, for the Province of Newfoundland to professed objectives for the teaching of English Literature. Based upon the findings of this study, Spencer maintained that the failure of Public Examinations in English Literature to determine to what extent the aims of the curriculum were being achieved

> was probably due to the fact that departmental examinations require a great amount of simple recall on the student's part. Objectives at the higher levels of learning are subscribed to but are almost entirely omitted from these examinations (Spencer, 1970, p. 1).

A cursory glance at past Public Examinations in Geography reveals an extremely high percentage of test items are related to the knowledge level of Bloom's taxonomy. This indicates that about the only level at which the students in Newfoundland schools are evaluated is that of memory or recall. Based upon personal experience it is entirely possible that in many Newfoundland schools, where the importance of any objective seems to be determined by the teacher's ability to measure it, grade conscious students memorize, and give back exactly what the teacher asks for, "knowledge" without understanding. Because Publi Examinations apparently ignore the higher levels of the cognitive process, this study seeks to determine if there is a discrepancy between the objectives as stated in Newfoundland geography curriculum guides and those

objectives tested on Public Examinations in Geography for Grades IX and X.

STATEMENT OF THE PROBLEM

The main problem under investigation is to determine: Whether or not there is a discrepancy, as identified by Bloom's Taxonomy of Educational Objectives: Cognitive Domain, between the objectives as stated in Newfoundland geography curriculum guides and those objectives tested on Public Examinations in Geography for Grades IX and X.

Preliminary to the main problem are two sub-problems. They are:

(i) Is the Taxonomy of Educational Objectives: Cognitive Domain an effective instrument in analyzing objectives stated in curriculum guides?

(ii) Is the Taxonomy of Educational Objectives: Cognitive Domain an effective instrument in analyzing the items tested on Public Examinations in Geography for Grades IX and X for Newfoundland?

Both of these sub-problems was considered in the pilot study which preceded the actual investigation.

NEED FOR THE STUDY

This study emerged from a recent development in Newfoundland's educational system. According to the Minister of Education at that time, Dr. F. W. Rowe, the academic year of 1969-1970 would be one of the most significant in the island's entire educational history.

> Among some of the major changes that occurred during that year was a decision to eliminate, for a period of five years, all Public Examinations except Grade XI . . . . . The purpose for eliminating Grade IX and X provincial examinations was two-fold: (i) to encourage schools to take the initiative in improving the quality of instruction, and in establishing their own evaluative criteria for promotion purposes, and (ii) to release our local school systems and teaching personnel from dependence on Public Examinations (Newsletter, 1970, pp. 2-5).

At the end of the five year trial period, the Department of Education proposed to conduct a reassessment of the situation to see if this change will have had a beneficial impact on education in the province of Newfoundland.

However, the researcher feels that Public Examinations in those two grades might possibly be eliminated altogether, since he believes that there are more meaningful ways of evaluating a pupil's progress in a particular grade. On the basis of personal experience the researcher has noticed that Public Examinations seldom emphasize the more complex cognitive processes such as Synthesis and Evaluation. Instead emphasis has often been placed upon the recall of factual content. In using Bloom's Taxonomy of Educational Objectives: Cognitive Domain as the basis for this investigation, it was hypothesized by the researcher that the objectives outlined in the provincial curriculum guides for Geography are on a higher level than those actually tested on Public Examinations.

SIGNIFICANCE OF THE STUDY

The major significance of this study must rest ultimately with its contribution to the arguments that are

presently being expounded in favour of eliminating Public Examinations altogether. This aim can be furthered by establishing if the Taxonomy of Educational Objectives: Cognitive Domain can contribute to the analysis of objectives for geography instruction as stated in curriculum guides and those items tested on Public Examinations in Geography.

ASSUMPTIONS UNDERLYING THE STUDY

Two basic assumptions underlie this study:

(i) There will be sufficient items concerned with the Cognitive Domain outlined in the geography curriculum guides.

(ii) The Taxonomy of Educational Objectives: Cognitive Domain is appropriate and provides a practical instrument within which the levels of objectives as outlined in Newfoundland curriculum guides and those tested on Public Examinations, can be developed. However, this assumption will be investigated during the main study.

OPERATIONAL DEFINITIONS

This section contains a brief description of the definitions that will be adopted for purposes of this study.

(i) Public Examinations: examinations for the province of Newfoundland administered under the supervision of the Department of Education and Youth to pupils in Grades IX, X, and XI.

(ii) Taxonomy: the framework used by Bloom to classify

educational objectives in the cognitive domain.

(iii) Cognitive Domain: includes those objectives which deal with the recall or recognition of knowledge and the development of intellectual skills and abilities. According to Bloom, the cognitive domain is the domain in which most of the work in curriculum development has taken place and where the clearest definitions of objectives are to be found, phrased as descriptions of student behaviour (Bloom, 1956, p. 7).

Subcategories of the Cognitive Domain are as follows:

(iv) Knowledge: involves the recall of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge objectives primarily emphasize the psychological processes of remembering. Therefore, knowledge represents the lowest level of learning outcomes in the cognitive domain (Gronlund, 1970, p. 20).

(v) Comprehension: is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (e.g. words to numbers), by interpreting material (e.g. explaining or summarizing), and by estimating future trends. These learning outcomes go one step

beyond the simple remembering of factual material, and represent the lowest level of understanding (Gronlund, 1970, p. 20).

(vi) Application: refers to the ability to use learned material in new and concrete situations. This may be in the form of such things as rules, methods, concepts, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under Comprehension (Gronlund, 1970, p. 20).

(vii) Analysis: refers to the ability to break down material into its component parts so that its organizational structure may be understood. Learning outcomes in this area require a higher level of understanding than those under Comprehension and Application because they require an understanding of both the content and the structural form of the material (Gronlund, 1970, p.20).

(viii) Synthesis: the putting together of elements and parts so as to form a whole. This involves the process of working with pieces, parts, and elements; then arranging them in such a way as to constitute a pattern or structure not clearly there before. Learning outcomes in this area stress creative behaviours, with major emphasis on the formation of new patterns or structures (Gronlund, 1970, p. 20).

(ix) Evaluation: is concerned with the ability to judge the value of material for a given purpose. It implies the use of a standard of appraisal, but the criteria may be those determined by the pupil or those which are given to him. Learning outcomes in this area are highest in the cognitive domain because they contain elements of all the other categories (Gronlund, 1970, p. 20).

SCOPE AND LIMITATIONS

Limitations which may have a bearing on this study are the following:

(i) Only stated objectives for geography instruction in Grades IX and X will be considered by the researcher in this study because they are the two grades in which Public Examinations have been eliminated. Geography has been selected because the researcher's undergraduate studies focused on Geography and he has taught both the Grade IX and Grade X geography courses which exist at present in Newfoundland schools.

(ii) Only the Cognitive Domain of Bloom's taxonomy will be used in this study, for objectives and test items are largely cognitive in format.

(iii) During the pilot study only three judges will be involved in checking the researcher's reliability of categorizing objectives according to the

Taxonomy of Educational Objectives: Cognitive Domain.

(iv) During this study the researcher will concern himself solely with the six major levels of the Cognitive Domain.

(v) In order to use Bloom's taxonomy in this study, the researcher and the judges will have to have some understanding as to how the items are taught. This is essential since it is possible to put any of the items on all six levels of the taxonomy depending upon how the course is taught.

HYPOTHESES

There is one major hypothesis underlying this study: The use of the Taxonomy of Educational Objectives: Cognitive Domain will indicate that there is a significant difference between the objectives outlined in curriculum guides and those items tested on the Public Examinations in Geography for Grades IX and X.

There are also six sub hypotheses which are intended to relate to the six levels of Bloom's taxonomy. These have been stated in directional form because the researcher suspects that Public Examinations in Geography emphasize the lowest level of Bloom's taxonomy, while the geography curriculum guides place emphasis on all levels of the taxonomy.

H_1 There will be significantly more Knowledge items found on the Public Examinations in Geography than

in the geography curriculum guides.

H_2 There will be significantly more Comprehension items found in the geography curriculum guides than on the Public Examinations in Geography.

H_3 There will be significantly more Application items found in the geography curriculum guides than on the Public Examinations in Geography.

H_4 There will be significantly more Analysis items found in the geography curriculum guides than on the Public Examinations in Geography.

H_5 There will be significantly more Synthesis items found in the geography curriculum guides than on the Public Examinations in Geography.

H_6 There will be significantly more Evaluation items found in the geography curriculum guides than on the Public Examinations in Geography.

ORGANIZATION OF THE STUDY

This chapter has included an introduction to the problem being researched, a statement of the problem under consideration, the purpose of the study, the significance of the study, operational definitions, the assumptions underlying the study, the scope and limitations, and the hypotheses to be tested. In Chapter 2, the researcher will conduct a review of the literature relevant to the study. In Chapter 3, the researcher will present the method of investigation, while the results of the investigation will be

presented in Chapter 4. This is followed by a discussion of the findings which is presented in Chapter 5. Finally in Chapter 6, the study will be summarized, conclusions will be presented, and recommendations will be submitted for further research.

Chapter 2

REVIEW OF RELATED LITERATURE

This chapter is divided into two main sections. In the first section, the researcher seeks to place the Public Examination system in Newfoundland in its historical context. This will be done by tracing the early history of the Council of Higher Education and outlining the role it had to play in administering the Public Examinations. In the second section, the researcher seeks to place the Taxonomy of Educational Objectives: Cognitive Domain in a suitable perspective for this study. In this section the researcher also attempts to establish the validity and reliability of Bloom's taxonomy, and to outline the varied usage it has been given since its development.

HISTORICAL BACKGROUND OF PUBLIC EXAMINATIONS

In this section the researcher seeks to place the Public Examinations of Newfoundland in a historical context for three reasons: (i) to show that the elimination of Public Examinations is something which has occurred before in Newfoundland's educational history, (ii) to make the outside observer aware of the events that have resulted in the present method of pupil evaluation, and (iii) to point out that it is possible for those in authority to retain the

present system if the need arises.

The Early History of the Council of Higher Education

Newfoundland's educational system is established along denominational lines. Because of this fact, the development of education in Newfoundland has been typified by much controversy over the past 100 years. During the nineteenth century, the allocation of financial grants by the government to the various religious denominations was a matter of vital concern. Arguments were presented as to how the money should be divided among the denominations, and this resulted in an act being passed in 1874 stating that the grant was to be divided between the Roman Catholics and Protestants equal in proportion to their population (Rowe, 1964).

However the history of education in Newfoundland has also been marked by co-operative efforts on the part of the various denominations. Rowe, in his book The Development of Education in Newfoundland, points out that

> In 1893, the Council of Higher Education was created and for the next 50 years it was to play an important role in secondary education. The organization was made up chiefly of educators in St. John's, and its main function was to prescribe a course of studies and set examinations for all pupils above what is now called Grade VI (Rowe, 1964, p. 111).

The Council of Higher Education, or C.H.E. as it was soon popularly labelled, also established the curriculum for the grades to be examined. This system was enthusiastically received by the denominations and proved to be a great

impetus to education in the colony. In fact, up to 1893 there was no uniformity in the curricula except that which the individual denominations decided to impose. Hickman points out that

> Each of the larger denominations was in effect a law unto itself in educational matters. Syllabi, curricula, and standards varied in the several denominations, there was a definite lack of unity (Hickman, 1941, p. 57).

Therefore, the Council of Higher Education was established with the approval of all parties for the purpose of remedying this defect.

Almost immediately after its establishment, the Council of Higher Education provided examinations which were to be administered to the Preliminary and Intermediate grades. In 1896, the Associate grade, and in 1899 the Primary grade were added, thus completing the list of grades that were subjected to the examinations of the Council of Higher Education. The effect of such examinations was three-fold:

> (i) it greatly helped in bringing a semblance of order out of chaos in the curriculum, (ii) it proved to be an incentive for pupils to stay in school at least until they had written the first of the C.H.E. examinations, and (iii) the examinations also gave the teachers an incentive for raising their standards of teaching because a teacher's success came to be evaluated by the number of successful candidates he or she had in the examinations (Braine, 1964, p. 29).

The Role of the Council of Higher Education Between 1900-1949

From 1894 to 1918 all Newfoundland examination papers were set and marked in England, as the Joint Examining Board of Cambridge and London Universities acted as agents of the

Council of Higher Education. In 1916 the Senior Associate examinations were instituted, thus replacing the London Matriculation examinations. However, this examination lasted for only thirteen years. In 1929 it was discontinued due to the fact that too few students were pursuing their education as far as the Senior Associate level. Apparently Grade XI had come to mark the completion of high school work in Newfoundland schools. In the meantime the names of the grades were changed to approximate the grade names that presently exist. These were as follows:

Senior Associate ..... Grade XII

Junior Associate ..... Grade XI

Second Year Intermediate ..... Grade X

First Year Intermediate ..... Grade IX

Second Year Preliminary ..... Grade VIII

First Year Preliminary ..... Grade VII

Primary ..... Grade VI

In 1918 the Council of Higher Education undertook to have the Primary papers set and marked in Newfoundland. In 1922 a similar procedure was adopted for the Preliminary grades, and in 1931 the Council of Higher Education also assumed responsibility for having the Grade IX and Grade X papers set and marked locally. In the same year Newfoundland became a member of the newly created Common Examining Board of the Maritime Provinces, which today has become known as the Atlantic Provinces Examining Board. Braine, in conducting an historical study of the social studies curriculum in

Newfoundland, points out that

> The members of this Board retained control of their own curriculum and set their own examinations. Then each province sent its quota of representatives to Nova Scotia where the papers were marked (Braine, 1964, p. 29).

However this arrangement applied only to the Grade XI papers from Newfoundland as the examinations for Grades IX and X were marked locally.

With Newfoundland relying less and less on England, it seems evident that serious attempts were being made to improve the quality of the Newfoundland examination system. During the years 1935 to 1944, the pattern of Public Examinations was seriously altered. In 1936 the Primary and First Year Preliminary examinations were discontinued and have not been reintroduced. In 1938, the Intermediate examinations were suspended, while the Second Year Preliminary examinations were modified. As a result of these changes, the Council of Higher Education then conducted examinations only in Grade VIII and Grade XI. A possible explanation as to why the Council of Higher Education examinations were still continued in these two grades is that Grade VIII was considered to be the elementary school leaving examination and Grade XI was considered to be the high school leaving examination, or the university entrance examination. However Hickman (1941) suggested that the reason for abolishing the Council of Higher Education examinations in these four grades was that the syllabus of the Council of Higher Education imposed

too rigid a system upon the schools. The time was spent in preparing for external examinations rather than in education. With the abolition of these examinations, the teachers had more time to work along the lines of the "new curriculum" that was set up in 1935.

This procedure worked quite well for the next three years, but in 1941 only 46% of the pupils who wrote the Grade XI examinations were successful. This caused many influential groups and organizations to express their dissatisfaction over the quality of instruction that was being given in Newfoundland schools. One such group was the Teachers' Association which

> petitioned the Council of Higher Education for the restoration of the Grade X examination, the argument being that an external examination was needed in Grade X in order to prepare the students for the external examination in Grade XI. In 1942, the Grade VIII examinations were dropped and the Grade X examination was resumed (Hickman, 1941, p. 59).

In 1944 the Grade IX examination was also reintroduced, thus leaving the province with a pattern of examinations that has prevailed up to 1970. It should be pointed out here that the Public Examinations in Grades IX and X were not obligatory. Therefore, many of the larger schools discontinued them in order to administer their own local school examinations.

The Public Examination System Since Confederation

In 1949 the Public Examinations Act was passed, and this resulted in the Council of Higher Education being dissolved. In its place was created a Division of Public

Examinations within the Department of Education under the direction of a Registrar, now the Director of Public Examinations. This division was responsible for the administration of examination policy according to the Public Examinations Act. It also arranged for the setting of the Grades IX and X examination papers and still advised the Atlantic Provinces Examining Board concerning the Grade XI papers. Some of the other responsibilities that have also been assumed by the Division of Public Examinations are: (i) the distribution of paper and other examination material to centers, (ii) regulating the conduct of the examinations, (iii) dispatching the Grade XI papers to the Atlantic Provinces Examining Board, (iv) marking of the Grades IX, X, and XI Commercial papers locally, (v) processing and releasing examination results, (vi) issuing diplomas to successful examination candidates, and (vii) tabulating and preserving examination records.

Summary

Evidently in the past the Department of Education maintained very tight control over Public Examinations in Newfoundland. Even though the Warren Royal Commission on Education and Youth has recommended that the present system of Public Examinations be continued, those in authority within the Department of Education have seen it fit to ignore this recommendation. As of 1971 the Department of Education and Youth has imposed a five year moratorium on Public

Examinations in Grades IX and X. This step was taken in the hope of improving the quality of instruction in our schools, and to release teaching personnel from dependence on Public Examinations. At the conclusion of the five year period, the Department of Education intends to conduct a reassessment of the situation to see if this change will have had a beneficial impact on education in the province of Newfoundland.

BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES: COGNITIVE DOMAIN AS AN EFFECTIVE RESEARCH INSTRUMENT

The research literature reviewed by the researcher in this section is intended to place the Taxonomy of Educational Objectives: Cognitive Domain in an appropriate perspective for this study. By reviewing a variety of documented material on Bloom's taxonomy, an attempt has been made to outline the varied usage it has received since its development.

Validity of the Instrument

According to Bloom (1956) the Taxonomy of Educational Objectives: Cognitive Domain is suggestive in pointing to a large number of problems in the field of education. In fact, since its development the taxonomy has been used on numerous occasions by researchers in order to analyze and/or compare the objectives of various educational areas. Bloom, and his colleagues, have repeatedly "taken lists of objectives found in courses of study and other educational literature and have attempted to classify them (Bloom, 1956, p. 21)." Rarely

have they encountered statements of pupil behaviours which could not be placed within the classification scheme. However, Bloom himself points out that

> one of the major problems in the classification of test items is that it is necessary in all cases to know or assume the nature of the examinees prior educational experiences.... This suggests that, in general, test material can be satisfactorily classified by means of the taxonomy only when the context in which the test problems were used is known or assumed (Bloom, 1956, p. 21).

Nevertheless, Bloom is of the opinion that the taxonomy is a valid research instrument. Krathwohl, a colleague of Bloom, has also maintained that the Taxonomy of Educational Objectives: Cognitive Domain "is a relatively concise instrument for the analysis of objectives, and provides a basis for the precise comparison of objectives (Krathwohl, 1965, p. 89)."

Even though the taxonomy has been used in analyzing a wide variety of problems in the area of education, existing evidence regarding the internal and external validity of Bloom's taxonomy has been minimal. A study which sought to prove the internal and external validity of Bloom's taxonomy was conducted by Kropp, Stoker, and Bashaw (1966). They found that the mean scores on tests constructed according to the taxonomic levels, decreased as the levels increased in difficulty. Based on this finding, it was concluded that the taxonomy was internally valid in the sense of having a hierarchical structure in terms of increasing difficulty. However, no evidence was found to support the taxonomy's

external validity because

> the validation of the taxonomy by relating it to external criteria was indeed an endless task for data obtained might be related to an almost infinite set of criterion measures (Kropp, *et al.*, 1966, p. 74).

The classes of Bloom's taxonomy have been so arranged that each successive category requires that the individual performing at that level, have all the information and skills required to perform at the preceding level and a little more. Consequently, Smith (1968) conducted a study to validate the contention made by the authors of the taxonomy that the cognitive processes involved were cumulative and hierarchical. Smith analyzed data that were contributed from a study done by Stoker and Kropp (1964) which involved the construction of four tests based upon the taxonomy's rationale. These tests were administered to students from the ninth through the twelfth grades. Based on the findings, Smith concluded that the contention made by the writers of the taxonomy, namely that it was a cumulative and hierarchical continuum of cognitive processes, was indeed correct.

Therefore, when one considers the studies which have been completed by researchers in attempting to validate the Taxonomy of Educational Objectives: Cognitive Domain it would appear to be an effective instrument to use, in order to determine if there is a discrepancy between the objectives as stated in Newfoundland geography curriculum guides and those objectives tested on Public Examinations in Geography for Grades IX and X.

Reliability of the Instrument

A number of pertinent studies may be cited, where the classification and comparison of test items and educational objectives was accomplished with a considerable degree of reliability by using the categories of Bloom's taxonomy.

Stanley and Bolten (1957) made the first reported attempt to determine whether or not raters could independently classify questions according to the Taxonomy of Educational Objectives: Cognitive Domain with any degree of accuracy. They were also interested in finding out whether or not Bloom's taxonomy was a reliable research instrument. In conducting the study, Stanley and Bolten selected a total of 227 items from Gerberich's "Specimen Objective Test Items". Eight graduate students who had studied the Taxonomy of Educational Objectives: Cognitive Domain for four weeks, were asked to classify the test items according to the subcategories of the taxonomy. Results of the study indicated that on only 5% of the items was there perfect agreement among the eight classifiers as to the exact subcategory. For 13% of the items, seven out of eight classifiers agreed. The percentages of agreement among six, five, four, three, and two classifiers were respectively: 17%, 17%, 21%, 19%, and 8%. Therefore on about one half of the items classified, five or more classifiers agreed exactly. Taking into consideration the fact that each item had to be classified into an exact subcategory, Stanley and Bolten concluded that Bloom's taxonomy could be used with a considerable

degree of reliability. They also concluded that there was enough agreement among graduate students independently classifying test items, to warrant the regular use of Bloom's taxonomy in analyzing standardized and teacher-made tests.

Stoker and Kropp (1964) conducted a study at Florida State University in order to answer the following two research questions: (i) Can judges agree on the cognitive process which an item is intended to measure? (ii) Can empirical evidence be gathered to support the hierarchical structure of the Taxonomy of Educational Objectives: Cognitive Domain?

Data for the study were gathered by using two tests especially built for the purpose. Each was a reading comprehension test, consisting of a series of items about the content of a 900 word reading passage dealing with science. Based on each reading passage was a test of 36 multiple-choice items, which were equally divided among the major categories of the taxonomy. Both tests were administered in preliminary form to eliminate obviously poor items and to clarify instructions. Nine judges, who were doctoral students in educational measurement and familiar with Bloom's taxonomy, were asked to independently classify the items of the two reading comprehension tests.

Five of the judges who classified the items on the reading comprehension test that was related to the structure of the atom agreed unanimously on the proper classification of 11 of the 36 items. On nine other items, only one judge

deviated from the other four, while on the 16 remaining items three of the five judges rated each item in the appropriate category. Meanwhile the remaining four judges classified the items on the other reading passage concerned with science. On 11 items their agreement was unanimous and perfectly related to the categories the items were intended to evoke. For 16 other items, three of the four judges agreed with each other and the intended category, while for the remaining nine items two of the four judges were in agreement.

The findings of the study gave general support to the cumulative and hierarchical structure of Bloom's taxonomy, and the researchers also concluded that "judges can assign items to the appropriate category with some accuracy (Stoker and Kropp, 1964, p. 40)."

Cox (1965) also conducted a study to determine the reliability of Bloom's taxonomy. Cox used the categories of Bloom's taxonomy in order to classify 379 multiple-choice test items which were derived from an introductory course in natural science. The classification of these items was done by three judges who were familiar with Bloom's taxonomy. The judges agreed on the classification of 85% of the items. As for the remaining 15% of the items where disagreement occurred, they were properly classified after consultation with a subject-matter expert. However, all of the items fell on the first four taxonomic levels, as none of the items were classified in the Synthesis or Evaluation categories.

In using the Taxonomy of Educational Objectives: Cognitive Domain to conduct his study, Cox realized that in order to accurately classify a test item it was necessary to know, or assume, the learning experiences which had preceded the administration of the test. Nevertheless, he concluded that the "taxonomy was a reliable instrument in classifying test items according to the instructional objectives they were designed to measure (Cox, 1965, p. 181)."

Use of Bloom's Taxonomy to Analyze Differences Between Test Items and Stated Course Objectives

Within the last few years the status of Geography as a school subject in Newfoundland has risen considerably, and today it is accorded a matriculation standing. However, from personal experience the researcher has noticed the emphasis placed on test results was often so great, that teachers found themselves stressing to their pupils the types of questions which were likely to appear on the Public Examination. It was also apparent, that this examination might not be measuring the same learning processes as those outlined in the relevant curriculum guides. Chambers (1964), in his article Testing and its Relationship to Educational Objectives, substantiates this viewpoint and shows that the problem exists in one other area outside of Newfoundland by stating that:

> The Regents' Inquiry into the character and cost of Public Education in New York State found that teachers were conscious of the objectives being tested in the Regents' Examinations and sought to

> emphasize these kinds of learning in their classes rather than to follow the objectives recommended in the local curriculum guides (Chambers, 1964, p. 246).

Despite the high level objectives often found in social studies curriculum guides, Berg (1965) observed that pupils were seldom asked on examinations to comprehend, apply, analyze, synthesize, or evaluate the body of facts, concepts, or generalizations that they studied. Instead the actual instructional process often proceeded quite independently of the stated course objectives. In fact, the objectives implicit in examinations were often unrelated to, and even in conflict with stated course objectives.

Scannell and Stellwagen (1960) also used the Taxonomy of Educational Objectives: Cognitive Domain to classify stated course objectives and test items on final examinations in Chemistry. Pertinent data were collected from high school chemistry teachers in order to compare the relationship between the statement and the measurement of the course objectives. Among the findings, it was noted that 50% of the stated objectives for chemistry courses and 60% of the test items related to the mere accumulation of knowledge. They also found that pupils were seldom required to exhibit complex cognitive skills on final examinations, and there was seldom to be found a direct relationship between the levels of stated course objectives and the levels of required examination behaviour.

Use of Bloom's Taxonomy in Analyzing Teacher-Made Examinations

Knowledge by itself is one of the most common educational objectives. From a casual perusal of the Public Examinations which have been administered in Geography over the past ten years, it appears that the most common educational objective tested has been the acquisition of knowledge or information.

According to Jarolimek (1962), emphasis on knowledge was inevitable at the early levels since pupils were rapidly building their cognitive structure. Objectives in this category were relatively easy to teach and evaluate because they depended almost entirely upon recall of information. Such objectives have traditionally been a part of the social studies curriculum in most schools, and consequently were familiar to most teachers. However Cox and Smith (1969) observed that

> Most teacher-made tests concentrated on the first division and category, Knowledge, because most teachers either did not know how to extend their appraisals beyond this level or regarded it as being too difficult or time-consuming to do so. Also in his day-to-day evaluation procedures the teacher would not get much assistance from his textbook exercises or textbook test manuals in going beyond the knowledge level (Cox & Smith, 1969, p. 91).

While knowledge is important, the present researcher feels that the teacher should not base his program and evaluation of the pupil, on instructional procedures which are related solely to the knowledge level of Bloom's taxonomy.

Pfeiffer and Davis (1965) attempted to adapt the

Taxonomy of Educational Objectives: Cognitive Domain for use in analyzing questions on teacher-made semester examinations for all ninth grade courses in one junior high school in north-east Ohio. The percentage of items in each of the six major categories was compared across courses and programs of study. In all cases, the highest percentage of questions fell into the knowledge category. Therefore, the general conclusion was that teacher-made examinations used in the study, emphasized the objectives of knowledge acquisition through the mental processes of memorization. The researchers also stated that there was an overall lack of concern for the objectives that would be classified in the areas of Analysis, Synthesis, and Evaluation.

As a result, it was concluded that teachers should be aware of which cognitive processes they were emphasizing in their test questions. Pfeiffer and Davis also maintained that there should be more emphasis on the higher objectives for all students in all courses.

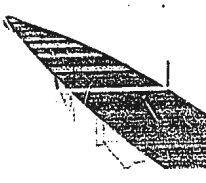
In order to classify course materials and examinations in a teacher education program Tyler and Okumu (1965) used the Taxonomy of Educational Objectives: Cognitive Domain. Their findings included (i) a noticeable discrepancy between course descriptions and the results of the behaviours of the various courses, (ii) a considerable emphasis upon knowledge type behaviours, and (iii) a lack of attention given to developing certain important inquiry skills about teaching-learning, and the curriculum. The researchers found that

Bloom's taxonomy was a useful structure for looking at course behaviours which were in the cognitive domain.

Use of Bloom's Taxonomy in Analyzing Classroom Questions

The findings of research have suggested that the majority of classroom questions, whether written or oral, are limited to those that require little more than a memorized response. Farley and Clegg (1969) conducted a study in two randomly selected towns in western Massachusetts to determine if there would be an increase in the cognitive level of teachers' classroom questions, when training was provided in the use of Bloom's taxonomy. By making teachers aware of the different cognitive levels, it was hypothesized that there would be an increase in the frequency and percentage of higher level questions asked by the teachers. Upon analysis of the data it was concluded that instruction in the use of the Taxonomy of Educational Objectives: Cognitive Domain did make a difference in the quality (cognitive level) of questions which teachers asked. The researchers also conceded that social studies objectives, which called for higher levels of thinking, were not being achieved through the use of questioning. They also suggested that the taxonomy could serve as an effective means of improving classroom instruction.

Huenicke (1970) conducted a study on the cognitive levels of objectives found in teachers' written plans. The study also examined the types of oral classroom questions asked by teachers. Twenty-two public school teachers of



Grades 4 to 6 volunteered. These teachers were representative of all socio-economic areas of the city selected for the study. The participants were requested to complete a questionnaire designed to ascertain their use of locally produced social studies curriculum guides. The results showed that there were 10 users and 12 non-users. The teachers were also asked to submit lesson plans for three social study sessions that were audiotaped. Huenicke concluded from the study that teachers who used curriculum guides wrote objectives and asked classroom questions at cognitive levels that were not significantly different from those teachers who did not use the guides provided. It was also noted that users tended to ask more questions at the four higher cognitive levels than non-users.

Davis and Tinsley (1967) conducted a study to determine the range of cognitive objectives manifested in secondary school social study classrooms, based on questions asked by student teachers and their pupils. Analysis of the data revealed that both teachers and pupils asked more "memory" questions than all other questions combined. The next largest number of questions fell in the category of comprehension. Questions that were applicable to the higher levels of the taxonomy were seldom asked either by the student teachers or the pupils. Therefore, Davis and Tinsley concluded that memory, or the acquisition of knowledge, was the major cognitive objective apparent in teachers' and pupils' verbal questions in social studies classrooms.

Similar studies were conducted by Floyd (1960) on teachers' oral questions in the primary grades, and by Gallagher (1965) who noted that "cognitive memory" was the most dominant thought process for both teacher and pupils in the social studies.

In each of the studies cited above there is a clear indication of a predominance of teacher questions and course objectives at the knowledge level of Bloom's taxonomy. The researcher suspects that similar findings would result if Bloom's taxonomy was used to analyze the classroom questions asked pupils by Newfoundland high school teachers. Therefore, it is entirely possible that the quality of the teachers' classroom questions is reflected in the Public Examinations administered by the Department of Education and Youth.

Use of Bloom's Taxonomy in Analyzing Textbook Questions

With respect to analyzing textbook questions, the Taxonomy of Educational Objectives: Cognitive Domain has been particularly effective. Davis and Hunkins (1966) used Bloom's taxonomy to conduct a study on the type of thinking processes fostered by textbook questions. Three recently published fifth grade social studies textbooks served as the basis for this study, and from them came a total of 732 questions. Each of these questions was categorized by seven experienced teachers using the taxonomy's classes and sub-classes. Results were tabulated, and the questions were re-examined by the investigators. When there was disagreement

among the judges on a particular item, that question was studied again and the investigators determined its appropriate classification.

Among the conclusions was the realization that the three books, written along different approaches, were very similar in the cognitive emphases of their questions. An overwhelming majority of the questions in each of the textbooks were concerned with knowledge. In fact there was a uniform neglect of the higher mental processes of Analysis, Synthesis, and Evaluation. Of the 139 questions in Textbook A only 14% of them were classified in the higher thinking operations, and almost all of them were in the category of Comprehension. There was one question that required an application of knowledge, and one other question required an operation of synthesis. Textbook B contained 350 questions, and not one of them was categorized in the classes of Analysis, Synthesis, or Evaluation. In fact only 2% of the questions demanded an application of knowledge. Textbook C differed from the other two textbooks, because two of its 243 questions required an evaluation with respect to external criteria. In addition 3% of its questions were classified according to Level 2.00--Comprehension--and 10% of its questions were classified as application items, a far greater proportion than in either of the other books. The researchers also made the observation that in the three textbooks none of the questions studied required analytic thinking, only one required the pupils to engage in synthesizing material, and only two

questions necessitated evaluative thinking on the students' part.

Consequently, such textbooks were classified as being self-contained; information was presented and questions required pupils to "give it back" in substantially the same form in which it was presented. The researchers also pointed out that since textbooks are the basic instructional materials in a classroom, teachers who base their program and evaluate pupils' learning with the questions in these textbooks are simply not fostering the development of the pupils' thinking.

A similar study was conducted by Pfeiffer and Hunkins (1965), and illustrated the usefulness of Bloom's taxonomy in analyzing classroom questions that were based on the textbook. They concluded that there was a need for teachers to analyze such questions for the following reasons: (i) so that proper emphasis could be given to all the cognitive functions, (ii) so that the course would be highly related to the cognitive function the teacher hoped to encourage, and (iii) so that the teacher would realize that more stimulating questioning was essential for high quality instruction to be achieved in the educational process.

Other Uses of Bloom's Taxonomy

The Taxonomy of Educational Objectives: Cognitive Domain has received widespread usage in the field of educational research. Such usage has supported the notion that the taxonomy has been accepted in a broad sense as a

research instrument which has utility.

Ellis (1963) used Bloom's Taxonomy of Educational Objectives: Cognitive Domain to classify objectives for teaching nutrition to students in secondary health courses. A list of 534 objectives was prepared as a questionnaire and submitted to a selected group of nutritionists and health educators, who decided on the suitability of the objectives for general education purposes. Based upon the judges classifications of the objectives, Ellis concluded that the taxonomy was applicable to the field of health education in helping to define the substantive content and objectives.

Carroll (1965) also used Bloom's taxonomy in a manner similar to Ellis in order to classify the objectives of alcohol education. Carroll concluded that the taxonomy could be a useful, logical schema for organizing alcohol education programs. Similar studies were simultaneously conducted by Elliott (1965) and Klein (1965).

Apart from analyzing the objectives of such things as alcohol education and health education, Bloom's taxonomy has also been used in studies on medical examinations. Miller, *et al.*, (1965) analyzed written, objective examinations in orthopaedic training and found that primary emphasis was placed on the factual recall of knowledge. Evans, *et. al.*, (1966) used Bloom's taxonomy in order to analyze tape recordings of oral medical examinations. Again they found a similar assessment for recall of factual content.

SUMMARY

The research literature cited in this chapter has supported the idea that Bloom's taxonomy is effective in identifying and analyzing course objectives, test items, textbook questions, and classroom questions asked both by students and teachers. There also appears to be sufficient evidence supporting the idea that the taxonomic categories can be accurately applied to a wide variety of educational problems. That the Taxonomy of Educational Objectives: Cognitive Domain is useful, and "is being used effectively seems difficult to deny in light of the increasing number of studies and writings which refer to it (Pancella, 1970, p.58)."

Chapter 3

METHOD OF INVESTIGATION OF THE PROBLEM

In this chapter the researcher will outline the procedures used to conduct this study. Separate sections will deal with the instrument, the preliminary investigation, the pilot study, the collection of data, the hypotheses, and the statistical procedures used in the analysis of data.

THE INSTRUMENT

The Taxonomy of Educational Objectives: Cognitive Domain is a classification of the goals of an educational system. As originally conceived the taxonomy was to cover three behavioural domains; the cognitive, the affective, and the psychomotor. The cognitive domain deals with objectives related to recall or recognition of knowledge, and the development of intellectual skills and abilities. The affective domain relates to objectives which describe changes in interests, attitudes, values, and the development of appreciation. The psychomotor domain covers objectives having to do with manual and motor skills.

Krathwohl, one of the developers of the Taxonomy of Educational Objectives, has characterized it as essentially an educational-logical-psychological classification system. In clarifying this statement, Payne (1968) quotes Krathwohl

by stating that:

> The taxonomy represents an 'educational' system as the categories correspond to those about which a teacher is concerned, in developing curricula and selecting learning experiences. It is 'logical' because its categories are precisely defined and can be subdivided. It is 'psychological' because it is consistent with current thought in the psychological sciences, although it is not tied to any particular theory (Payne, 1968, p. 16).

The cognitive domain is comprised of two major categories: knowledge, and intellectual skills and abilities. The categories are further divided into six groups, and these in turn--with the exception of Level 3.00, Application--are subdivided, thus yielding a total of 29 categories. These subdivisions further delineate the categories and help clarify the elements of the Taxonomy of Educational Objectives: Cognitive Domain, however they will not be utilized in this study.

The Taxonomy of Educational Objectives: Cognitive Domain proceeds from the simple to the complex, and from the concrete to the abstract. It has also been viewed as a hierarchy, in the sense that each skill has been built upon, and assumes acquisition of the previous skill. The classes of Bloom's taxonomy and their sub-classes are defined as follows:

1. Knowledge: the recall of specifics and universals, the recall of methods and procedures, or the recall of a pattern, structure or setting.

Subclasses: 1.10 knowledge of specifics, 1.11 knowledge

of terminology, 1.12 knowledge of specific facts, 1.20 knowledge of ways and means of dealing with specifics, 1.21 knowledge of conventions, 1.22 knowledge of trends and sequences, 1.23 knowledge of classifications and categories, 1.24 knowledge of criteria, 1.25 knowledge of methodology, 1.30 knowledge of the universals and abstractions in a field, 1.31 knowledge of principles and generalizations, 1.32 knowledge of theories and structures (Bloom, 1956, pp. 201-204).

2. Comprehension: understanding of apprehension such that the individual knows what is being communicated and can make use of the material or idea without necessarily relating it to other material or seeing its fuller implications.

   Subclasses: 2.10 translation, 2.20 interpretation, 2.30 extrapolation (Bloom, 1956, pp. 204-205).

3. Application: the use of abstractions in particular and concrete situations.

   Subclasses: none (Bloom, 1956, p. 205).

4. Analysis: the breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made

clear and/or the relations between ideas expressed are made explicit.

Subclasses: 4.10 analysis of elements, 4.20 analysis of relationships, 4.30 analysis of organizational principles (Bloom, 1956, pp. 205-206).

5. Synthesis: the putting together of elements or parts so as to form a whole.

Subclasses: 5.10 production of unique communication, 5.20 production of a plan or proposed set of operations, 5.30 derivation of a set of abstract relations (Bloom, 1956, pp. 205-206).

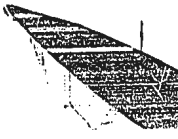
6. Evaluation: judgements about the value of material and methods for a given purpose.

Subclasses: 6.10 judgements in terms of internal evidence, 6.20 judgements in terms of external criteria (Bloom, 1956, p. 207).

For a more detailed treatement of these categories the reader is referred to Bloom's taxonomy.

PRELIMINARY INVESTIGATION

The researcher received four replies to a circular sent to faculty members in the Department of Curriculum and Instruction at Memorial University requesting their assistance in conducting the actual study. Three of the replies were selected, and on contact the respective faculty



members agreed to act as judges during the study. The main purpose for using judges was to validate the competency of the investigator in rating test items and curriculum guide objectives according to the six major levels of Bloom's taxonomy.

With selection of the judges completed, it was then decided by the researcher to administer a preliminary questionnaire consisting of 25 randomly selected items based upon the Grade VIII geography curriculum guide. The purpose for administering this preliminary questionnaire was three-fold: (i) to ascertain the judges familiarity with the research instrument, (ii) to validate the researcher's competence in using the Taxonomy of Educational Objectives: Cognitive Domain, and (iii) to determine if the taxonomy could be utilized in classifying curriculum guide objectives. However, the responses of the judges indicated that several serious problems would have to be overcome before the main study was conducted. These problems, and how they were solved by the researcher are discussed in detail in Chapter 4.

PILOT STUDY

Discussion of the results of the preliminary investigation with the three judges made the researcher aware of the fact that curriculum guide objectives could not be classified according to Bloom's taxonomy unless they were stated in terms of actual pupil performance. Therefore, the researcher had to assign a behavioural interpretation to all

of the objectives outlined in the Grades IX and X geography curriculum guides. Successful completion of this step was considered vital to the main study because the researcher would be classifying the intended behaviour of students according to the six major levels of Bloom's taxonomy. After soliciting the assistance of 21 Grade IX geography teachers for the purpose of validating the researcher's behavioural interpretation of the geography curriculum guide objectives, the pilot study was conducted.[1] The pilot study consisted of 104 items that were randomly selected both from the Public Examinations in Geography, and from the items in the geography curriculum guides that were previously assigned a behavioural interpretation. Of this total, 62 were rated by the researcher as Knowledge, 28 as Comprehension, 2 as Application, 6 as Analysis, 4 as Synthesis, and 2 as Evaluation. The randomly selected items were then prepared as a questionnaire for the three judges, who were asked to independently classify the items according to the six major levels of Bloom's taxonomy.

The main purpose for conducting a pilot study was to solve two sub-problems. They were:

(i) Is the Taxonomy of Educational Objectives: Cognitive Domain an effective instrument in analyzing objectives

---

[1]Permission to solicit the assistance of Grade IX geography teachers was obtained by means of a letter sent to the Avalon Consolidated School Board and the Roman Catholic School Board for St. John's--see Appendix A.

stated in curriculum guides?

(ii) Is the Taxonomy of Educational Objectives: Cognitive Domain an effective instrument in analyzing the items tested on Public Examinations in Geography for Grades IX and X for Newfoundland?

Through means of the pilot study an attempt was also made to validate the researcher's competence in rating curriculum guide objectives to the six major levels of Bloom's taxonomy.

COLLECTION OF DATA

The main study was concerned with using the Taxonomy of Educational Objectives: Cognitive Domain to analyze and compare geography curriculum guide objectives, with questions asked on the Public Examination in Geography for the province of Newfoundland. Data for this study were derived from two sources: geography curriculum guides for Grades IX and X, and from the Grades IX and X Public Examinations in Geography that were administered between 1960 and 1969. The population studied totalled 1,058 items--see Appendix B. Each item was assigned to one of the six major categories of Bloom's Taxonomy of Educational Objectives: Cognitive Domain. In certain instances it was difficult to distinguish between two taxonomy levels as the choice for classifying a test item. When this occurred the researcher and the three randomly selected judges adopted the practice of arbitrarily assigning the item to the highest possible level. This procedure thus enabled the classifiers to follow a common criterion in

classifying the items.

A total of 319 curriculum guide objectives were identified as a result of analyzing the Grades IX and X geography curriculum guides. These objectives were stated in terms of pupil performance, and then classified according to the six major levels of Bloom's Taxonomy of Educational Objectives: Cognitive Domain. Test items obtained from the geography Public Examinations totalled 950. However to prevent unnecessary duplication the items were scrutinized by the researcher. This procedure was undertaken in order to provide greater validity to the results of the study and to present an accurate description of the cognitive levels tested by the Public Examination in Geography. Therefore, a total of 739 test items were used in the main study, all of which had been asked at least once. These test items were also classified according to the six major levels of Bloom's taxonomy.

HYPOTHESES

Underlying the main study was one major hypothesis stated in the null form. It was:

The use of the Taxonomy of Educational Objectives: Cognitive Domain will indicate that there is no significant difference between the objectives outlined in curriculum guides and those items tested on the Public Examinations in Geography for Grades IX and X.

More specifically there were six sub hypotheses, and

these have also been stated in null form:

H_1: There will be no significant difference between the number of Knowledge items found on the Public Examinations in Geography for Grades IX and X, and those outlined in the geography curriculum guides for Grades IX and X.

H_2: There will be no significant difference between the number of Comprehension items found in the geography curriculum guides for Grades IX and X, and those tested on the Public Examinations in Geography for Grades IX and X.

H_3: There will be no significant difference between the number of Application items found in the geography curriculum guides for Grades IX and X, and those tested on the Public Examinations in Geography for Grades IX and X.

H_4: There will be no significant difference between the number of Analysis items found in the geography curriculum guides for Grades IX and X, and those tested on the Public Examinations in Geography for Grades IX and X.

H_5: There will be no significant difference between the number of Synthesis items found in the geography curriculum guides for Grades IX and X, and those tested on the Public Examinations in Geography for Grades IX and X.

H_6: There will be no significant difference between the

number of Evaluation items found in the geography curriculum guides for Grades IX and X, and those tested on the Public Examinations in Geography for Grades IX and X.

DATA PROCESSING

In order to analyze data pertinent to the main hypothesis--that the use of the Taxonomy of Educational Objectives: Cognitive Domain will indicate that there is a significant difference between the objectives outlined in Newfoundland geography curriculum guides and those items tested on the Public Examination in Geography for Grades IX and X--the Chi-square statistic was used with .05 being the accepted level of significance. The same statistical procedure was also used in order to analyze the six sub hypotheses that have been stated in Chapter 1. A detailed description of these results is outlined in Chapter 4.

Chapter 4

RESULTS OF THE INVESTIGATION

This chapter is divided into three sections. In the first section, the researcher presents a description of the preliminary investigation and outlines the events that occurred prior to the actual study. In the second section, the pilot study and the procedures used to solve the two sub problems that had underlain the main study are described by the researcher. The third section presents an analysis of the data concerning the hypotheses proposed in the study. In this section the researcher also sets forth the findings related to the main hypothesis, and reports on the testing of the six sub hypotheses.

PRELIMINARY INVESTIGATION

Prior to the pilot study, a circular was sent to faculty members in the Department of Curriculum and Instruction at Memorial University requesting their assistance, if they were familiar with Bloom's Taxonomy of Educational Objectives: Cognitive Domain. A total of four replies was received. This was one above the number that was required by the researcher. It was decided prior to conducting this study that three judges would suffice in helping this investigator to determine his competency in classifying test items

and curriculum guide objectives. Upon contact, the three randomly selected judges expressed their willingness to participate in the pilot study.

One of the judges (Judge X) taught undergraduate education courses in Language Arts at Memorial University, and was vaguely familiar with the Social Studies program that currently exists in Newfoundland schools. She expressed a willingness to participate in the pilot study on the basis of having taught Social Studies in high schools outside of Newfoundland, and also having worked previously with Bloom's taxonomy in order to classify test items and personal course objectives. Another of the judges (Judge Y) was also familiar with Bloom's taxonomy, but his subject area was Science Education. Even though he admitted to being only vaguely familiar with the Social Studies program in Newfoundland schools, he still expressed an interest to participate in the pilot study. The third judge (Judge Z) was a recent addition to the Faculty of Education, and his area of specialization was Reading. He maintained that he was moderately familiar with Bloom's taxonomy, but knew nothing about the Social Studies program which currently exists in Newfoundland schools.

With selection of the judges completed, an attempt was made to validate the investigator's competency in using the Taxonomy of Educational Objectives: Cognitive Domain, and to find out if the taxonomy could be used to classify curriculum guide objectives. This was attempted by rating

25 objectives, randomly selected from the Grade VIII geography curriculum guide according to the six major levels of Bloom's taxonomy. Since the researcher was not aware of the extent to which each of the judges was familiar with Bloom's taxonomy, the preliminary questionnaire was also given to them in order to determine their familiarity with the research instrument--see Appendix C.

Judges X and Y completed the questionnaire and returned it to the researcher. However, Judge Z maintained that he could not complete the pretest because of the lack of clarity that prevailed among the items. He stated that some of the objectives could not be classified in their present form, because they failed to specify the types of behaviour expected of the students taking the course. The curriculum guide objectives would have to be given a behavioural interpretation if Bloom's taxonomy was to be used effectively. This viewpoint was also expressed by the two responding judges.

With the preliminary questionnaire completed, the responses of the two co-operating judges showed that the overall percentage of agreement between the researcher and the judges was so diverse, that the use of Bloom's taxonomy as an effective instrument in classifying curriculum guide objectives became doubtful. Agreement between Judge X and the researcher was 60%, while agreement between Judge Y and the researcher was 35%. The focal point of disagreement was centered around what was meant by such curriculum guide terms

as "to note", "to understand", "to appreciate", and "to know". Through discussion, it was pointed out to the researcher that these terms failed to specify precisely what type of behaviour was expected of the pupil.

Each judge maintained that most of the curriculum guide objectives were stated in general terms which were too vague to be translated into educational practice. In their present form they were of little value in deciding which learning experiences were appropriate to a course. In the meantime Judge Y pointed out that the term "understands" presented an additional problem as it was really representative of several different kinds of behaviour; such as thinking, skills, and knowledge. The two responding judges also criticized the curriculum guide objectives. They maintained that the curriculum guide objectives had no effect on the teaching that occurred in the actual classroom setting. The overall result of this preliminary investigation was that the judges felt the curriculum guide objectives in their present form were subject to multiple interpretation. For example, "to understand something" could mean a literal comprehension or a translation from one form to another one. Therefore to classify such objectives in their present form, was considered to be a very difficult task by the three judges.

A very good argument was also put forth maintaining that each and every geography teacher could conceivably teach the Grade IX and Grade X geography course in a manner

that was suited to the situation in which he found himself. This implied that the curriculum guide objectives as set down in the geography teacher manuals for Grades IX and X, would have to be given a behavioural interpretation if Bloom's taxonomy was to be considered an effective and valid instrument in conducting this study. The curriculum guide objectives would have to be stated clearly so that the precise behaviours intended, were perceptible and so that the qualities expected of them, were fully understood.

Having accepted the recommendations of the judges, the researcher assigned a behavioural interpretation to each objective that was outlined in the geography curriculum guides for Grades IX and X. Once completed, a major problem still had to be resolved; was the researcher's behavioural interpretations of the objectives, as outlined in the geography curriculum guides, a valid one? To resolve this problem, it was decided to solicit the assistance of the Grade IX geography teachers in and around the environs of St. John's by means of an opinionnaire. These teachers represented both the rural and urban areas under the jurisdiction of their respective school boards. Therefore, it is entirely possible that the teaching practices which they utilized are representative of those employed by other teachers elsewhere in Newfoundland. The opinionnaire was to serve one major purpose: it would enable the researcher to find out if his behavioural interpretation of the geography curriculum guide items was valid.

The opinionnaire consisted of two parts: an answer sheet, and 50 items randomly selected from the Grade IX geography curriculum guide along with their appropriate behavioural interpretation--see Appendix D. It was agreed, prior to approaching the teachers, that an overall percentage of agreement of 85% would be interpreted to mean that the researcher's interpretations of the geography curriculum guide objectives was indeed a valid one.

On checking with the Avalon Consolidated School Board and the Roman Catholic School Board for St. John's, it was learned that there was a total of 41 Grade IX teachers who were teaching Geography in their respective schools. Of this total, 21 teachers were randomly selected and requested to complete the opinionnaire. Fifteen teachers were employed by the Roman Catholic School Board, while the remaining six teachers were employed by the Avalon Consolidated School Board for the St. John's area.

Of the 21 opinionnaires forwarded to the teachers, 13 were completed and returned before a follow-up request was made to the schools that still had opinionnaires outstanding. Of the remaining eight opinionnaires, six were received after the follow-up request was made, thus bringing to 19 the total number of completed opinionnaires. Two incomplete opinionnaires were returned by teachers who refused to complete it for personal reasons. As a result, the completed response from the teachers totalled 90.5%, and the results cited below are based on this percentage.

The percentages of agreement between each responding teacher and the researcher are summarized in Table 1. Agreement between the researcher and each teacher varied from a low of 48% to a high of 100%, with the overall percentage of agreement being 93.3%. Eight of the responding teachers agreed unanimously with the researcher's interpretation of the curriculum guide objectives, while eight other teachers agreed with the researcher's classification on 90% or more of the items presented for their approval.

Where teachers disagreed with the researcher's interpretation of a particular objective, they were requested to state an appropriate alternative. In most instances teachers were constructive in their criticism. In fact, it was common for teachers to make the observation that the original curriculum guide objectives often contained more than one behavioural objective. In the case where agreement between the researcher and one of the teachers was 48%, it should be pointed out that the latter did not follow the instruction of submitting an alternative behavioural interpretation. Therefore, it could be conceivable that this particular teacher completed the opinionnaire without actually understanding what was expected.

TABLE I

AGREEMENT BETWEEN THE RESEARCHER AND EACH TEACHER ON THE BEHAVIOURAL INTERPRETATION OF THE CURRICULUM GUIDE OBJECTIVES ON THE OPINIONNAIRE

Teacher	Percentage of Agreement
1	96%
2	90
3	100
4	94
5	--
6	88
7	100
8	---
9	100
10	98
11	98
12	98
13	92
14	48
15	100
16	73
17	100
18	100
19	100
20	98
21	100

The agreement between the researcher and the responding teachers on each behavioural item is summarized in Table II. Agreement ranged from a low of 74% to a high of 100%, with an overall percentage of agreement being 93.7%. On 17 of the items there was unanimous agreement between the researcher and the teachers, while on another 27 items agreement was greater than 90%. Of the remaining six items, agreement between the researcher and the teachers on five of those items, was greater than 80%. An overall percentage of

agreement of 74% was obtained on Item 13, and this represented the least amount of agreement between the researcher and the responding teachers.

TABLE II

AGREEMENT BETWEEN THE RESEARCHER AND THE RESPONDING TEACHERS ON EACH BEHAVIOURAL INTERPRETATION OF THE ITEMS ON THE OPINIONNAIRE

Item	Percentage of Agreement	Item	Percentage of Agreement
1	95%	26	90%
2	90	27	90
3	95	28	95
4	90	29	100
5	90	30	95
6	95	31	100
7	100	32	100
8	84	33	95
9	95	34	95
10	90	35	95
11	84	36	95
12	80	37	90
13	74	38	90
14	85	39	95
15	90	40	100
16	100	41	100
17	100	42	100
18	95	43	90
19	90	44	100
20	90	45	100
21	90	46	100
22	84	47	100
23	100	48	100
24	100	49	100
25	95	50	95

Summary

On the basis of the results obtained from the opinionnaire, it was apparent that the researcher had placed

an appropriate behavioural interpretation on the original objectives outlined in the geography curriculum guides. Several teachers recommended changes in the wording of some objectives, but many of these involved changes that resembled the professional language in which the objectives were first written. However, when appropriate recommendations for change in format and phraseology were made by the teachers in order to clarify ambiguities, they were duly implemented into the actual sample to be studied by the researcher.

PILOT STUDY

As the problems presented in the preliminary investigation had been successfully surmounted, it was now possible for the researcher to conduct the pilot study. To begin this study, it was necessary to gather all the geography test items that had been asked on the Grades IX and X Public Examinations between 1960 and 1969 so as to have a sufficient population. A second step vital to the study, was the placing of an appropriate behavioural interpretation on all of the objectives outlined in the geography curriculum guides. This was done so that the objectives could be classified according to the six major levels of Bloom's Taxonomy of Educational Objectives: Cognitive Domain. With a combined sample of 1,058 items, the next step was to classify each item according to the major levels of Bloom's taxonomy.

The pilot study consisted of 104 randomly selected items, of which 71 test items were randomly selected from

the Public Examinations in Geography, while the remaining 33 items were behavioural interpretations of the objectives that were randomly selected from the geography curriculum guides. These numbers represented approximately 10% of the total population of test items and curriculum guide objectives used by the researcher in this study. Selection of the sample items for classification by the three judges was made by using a table of random numbers (Arkin & Colton, 1968). Of the 104 randomly selected items 62 were rated by the researcher as Knowledge, 28 as Comprehension, 2 as Application, 6 as Analysis, 4 as Synthesis, and 2 as Evaluation. These items were then prepared as a questionnaire and submitted to the three judges for their classification according to the six major levels of Bloom's taxonomy.

Description of the Pilot Study

Both Judges X and Y completed the questionnaire and returned it to the researcher. However Judge Z still maintained that he could not complete the questionnaire even though the curriculum guide objectives had been given a behavioural interpretation. He questioned whether or not the study could be done even after the items had been given a behavioural interpretation, because in his opinion Bloom's taxonomy was an inappropriate research instrument for the type of work being undertaken by this investigator. Because of this attitude, he recommended that the researcher forego the use of his services in conducting the pilot study, and

that the latter seek assistance elsewhere.

In defense of the opinions of the researcher, and Judges X and Y that the present study could be done if certain problems could be solved several sources have been cited. Bloom maintains that:

> in classifying test items it is necessary to know or assume the nature of the pupils' prior educational experiences . . . . Test material can be satisfactorily classified by means of the taxonomy only when the context in which the test problems were used is known or assumed . . . . As yet, in the cognitive domain few statements of student behaviours have been encountered which could not be placed within the taxonomy's classification scheme (Bloom, 1956, pp. 20-21).

Bloom also states that:

> although objectives and test materials and techniques may be specified in an almost unlimited number of ways, the student behaviours involved in these objectives can be represented by a relatively small number of classes. Therefore, this taxonomy is designed to be a classification of the student behaviours which represent the intended outcomes of the educational process (Bloom, 1956, p. 12).

Other researchers have also used Bloom's taxonomy in order to conduct studies relating to educational problems. Stanley and Bolten (1957) made the first reported attempt to determine whether or not raters could independently classify questions according to the Taxonomy of Educational Objectives: Cognitive Domain with any degree of accuracy. On the basis of their findings, they concluded that Bloom's taxonomy could be used with a considerable degree of reliability and warranted use in analyzing standardized and teacher-made tests.

Ellis (1963) used Bloom's Taxonomy of Educational Objectives: Cognitive Domain to classify objectives for

teaching nutrition in secondary health education courses. He used judges to decide on the suitability of the objectives for general educational purposes. Ellis concluded that the categories of the taxonomy were applicable to the field of health education in helping to define the substantive content and objectives. A similar study was also conducted by Carroll (1965) on the objectives of alcohol education, and he arrived at the same conclusion.

The use of Bloom's taxonomy to solve a variety of educational problems has supported the notion that it has been accepted, in a broad sense, as an instrument that has utility. On the basis of the research cited earlier it is evident that the Taxonomy of Educational Objectives: Cognitive Domain is an effective instrument in classifying the intended behavioural outcomes of students--the ways in which individuals are to act, think, or feel as the result of participating in some unit of instruction. Therefore, contrary to the opinion of Judge Z this researcher felt that the research literature reviewed more than adequately justified the use of Bloom's taxonomy in doing this study.

Because of Judge Z's refusal to complete the questionnaire, the researcher approached the fourth respondent to the circular that was originally distributed to Faculty members in the Department of Curriculum and Instruction. This respondent taught one of the undergraduate courses in Social Studies education, and he expressed a willingness to participate in the pilot study after he had the opportunity to

review Bloom's taxonomy. He was also familiar with the Social Studies program that was being taught in Newfoundland schools.

Once the questionnaires were completed and returned to the researcher, percentages of agreement were obtained by counting the number of items that the judges indicated as agreeing with the classification of the researcher. However, it should be pointed out that the judges did not know the researcher's classification beforehand. A summary of the judges responses is given in Appendix E.

Since three judges were used in the pilot study, the number of responses received was 312, and it is upon the basis of this figure that percentages of agreement have been calculated. Between Judge X and the researcher there was an overall agreement of 91.5%, between Judge Y and the researcher there was an overall agreement of 74.0%, and between Judge Z and the researcher there was an overall agreement of 84.0%. Between the researcher and the three judges there was an overall agreement of 83.2% on all items.

The percentage of agreement on Questionnaire One between the three judges and the researcher on each level of Bloom's taxonomy has been summarized in Table III. The range of agreement varied from a high of 96.8% on Level 1.00 to a low of 22.2% for the Level 4.00 items. On Level 2.00 the percentage of agreement was 78.6%, on Level 3.00 it was 66.7%, on Level 5.00 it was 25.0%, while on Level 6.00 the percentage of agreement was 33.3%. Such results indicated that judges

could agree in the majority of cases on the proper classification of an item that was related to the lower levels of Bloom's taxonomy. However the percentage of agreement on the items assigned to the three upper levels of Bloom's taxonomy was so low that the researcher administered a second questionnaire. It should also be pointed out that a similar range of agreement between researchers and judges resulted in studies conducted by Herron (1966) and Pancella (1970). In fact, the former maintained that "deviations among judges were to be expected in any classification system and were not considered particularly disturbing" (Herron, 1960, p. 163).

TABLE III

PERCENTAGE OF AGREEMENT OBTAINED ON QUESTIONNAIRE ONE BETWEEN THE RESEARCHER AND THE JUDGES ON EACH LEVEL OF BLOOM'S TAXONOMY

Level	Agreement	Disagreement	Percentage of Agreement
Knowledge	180	6	96.8%
Comprehension	66	18	78.6
Application	4	2	66.7
Analysis	4	14	22.2
Synthesis	3	9	25.0
Evaluation	2	4	33.3
Accumulative	259	53	83.0

In the interim period between the administration of the first questionnaire and the second one, the researcher revised several of the curriculum guide objectives in order to clarify their meaning. The use of certain behavioural

terms--for example, to create, to separate, to appraise--to describe the original objective still caused confusion among the judges. Having removed such nebulous behavioural terms from the study, and having clarified the wording of any objective that was not clearly stated in terms of pupil performance the researcher proceeded to construct the second questionnaire. This questionnaire consisted of a stratified sample of 50 items from the total population that apparently referred to the upper levels of Bloom's taxonomy. Of this total 15 were rated as Knowledge, 14 as Comprehension, 6 as Application, 5 as Analysis, 6 as Synthesis, and 4 were rated as Evaluation. The judges were again requested to complete this second questionnaire, in order to see if there would be a favourable increase over the percentages of agreement that were obtained on the first questionnaire on the higher levels of the taxonomy. A summary of both the researcher's and the judges' classifications of the items listed on the second questionnaire is presented in Appendix F.

Results of the second questionnaire have been compared to those obtained from the first questionnaire, and summarized in Table IV. This time the results were much closer to agreement than they were for the first questionnaire, especially for the higher levels of the taxonomy. Such improvement can possibly be attributed to the fact that poorly stated behavioural objectives had been reworded by the researcher. This then, resulted in less confusion and uncertainty among the three judges. As on Questionnaire One, very high agreement was

attained once again between the researcher and the judges on the two lower levels of Bloom's taxonomy. However in the case of Level 3.00--Application--there was a drop from 66.7% agreement on the first questionnaire to 55.6% on the second questionnaire. This decrease was apparently due to the fact that items which were previously classified by the judges as Level 3.00, were being classified as Level 2.00 items on the second questionnaire. A possible reason, other than chance, for this change was that relevant curriculum guide objectives and test items merely went one step beyond the simple remembering of material, and therefore represented the lowest level of understanding--Comprehension. Consequently the researcher followed this criterion in conducting the main study.

However the percentages of agreement on the three upper levels of Bloom's taxonomy showed meaningful improvement. The results of Questionnaire One for Level 4.00 showed agreement on 22.2% of the items, but the result for Questionnaire Two was 53.3% agreement between the researcher and the three judges. The second questionnaire results for Level 5.00 showed an increase of 25.0%, as the agreement between the researcher and the three judges increased from 25.0% on Questionnaire One to 50.0% on Questionnaire Two. On Level 6.00, the second questionnaire result was 41.7% agreement between the researcher and the judges, and this figure represented an 8.4% increase over the first questionnaire result of 33.3% agreement.

The accumulative percentage of agreement for Questionnaire One was 83.0%, but for Questionnaire Two it was 75.3%.

Such a discrepancy could be attributed to the fact that the accumulative totals are different. For Questionnaire One the total number of possible agreements was 312, while for Questionnaire Two it was 150. These accumulative totals are extremely sensitive to the total number of possible agreements in each questionnaire. Therefore this variation in the total number of possible agreements caused the accumulative percentages to be different. Another possible explanation for the discrepancy was that the second questionnaire contained a larger proportion of items in the higher categories. However the mean percentage on the second questionnaire was 64.5%. This represented a 10.5% increase over the mean percentage obtained on the first questionnaire, which was 54.0%.

TABLE IV

PERCENTAGES OF AGREEMENT BETWEEN THE RESEARCHER AND THE JUDGES ON QUESTIONNAIRE ONE COMPARED TO THE PERCENTAGES OF AGREEMENT ON QUESTIONNAIRE TWO

Taxonomy Level	Questionnaire 1	Questionnaire 2
Knowledge	96.8%	95.6%
Comprehension	78.6	90.5
Application	66.7	55.6
Analysis	22.2	53.3
Synthesis	25.0	50.0
Evaluation	33.3	41.7
Accumulative	83.0	75.3
Mean	54.0	64.5

Summary

In conclusion, a total of 104 items were randomly selected from the 1,058 items that were to be utilized in the actual study. Each was rated according to the six major levels of the Taxonomy of Educational Objectives: Cognitive Domain. The first questionnaire used in the pilot study contained a random sample of each of the six levels, but the majority of the items fell below Level 4--Analysis. However the second questionnaire consisted of a stratified sample derived from the total population.

The 104 items on Questionnaire One were independently rated by a panel of three judges, and the overall percentage of agreement between the researcher and the judges was 83.0%. On this questionnaire the percentages of agreement were higher for the lower levels of Bloom's taxonomy than for the upper levels. In order to improve the lower percentage of agreement in the higher levels of the taxonomy, the researcher compiled a second questionnaire that supposedly contained a majority of items that were representative of the higher levels. Questionnaire Two was then forwarded to the three judges for their classification, and the results were compared to the results obtained on the first questionnaire. The results of Questionnaire Two indicated that there was a meaningful improvement in the percentages of agreement on the three higher levels of Bloom's taxonomy.

By conducting the pilot study, the two sub-problems that had underlain the main problem of this study were solved.

The Taxonomy of Educational Objectives: Cognitive Domain was shown to be an effective instrument in analyzing the items tested on Public Examinations in Geography for Grades IX and X for Newfoundland. The results of the pilot study also showed that the Taxonomy of Educational Objectives: Cognitive Domain was an effective instrument in analyzing objectives stated in curriculum guides, provided the objectives were stated in terms of appropriate behavioural performance on the part of the pupil. However the pilot study also made the researcher aware of the limitations of Bloom's taxonomy, even though it has been used in order to research a large number of problems in the field of education.

Upon completion of the main study, the researcher submitted a third questionnaire to Judge Z, who taught undergraduate courses in Social Studies education at Memorial University--see Appendix G. The purpose of this questionnaire was to ascertain inter-rater reliability on the main study.[2]

TESTING THE HYPOTHESES

Main Hypothesis

The main hypothesis stated that there would be a

---

[2]The third questionnaire consisted of a stratified sample of 106 items, which represented 10% of the total population and the six levels of Bloom's taxonomy. Of the 106 items presented in Questionnaire 3, 60 were rated by the researcher as Knowledge, 26 as Comprehension, 7 as Application, 5 as Analysis, 4 as Synthesis, and 4 were rated as Evaluation. The percentages of agreement between the researcher and Judge Z on this questionnaire were 96.7% for Level 1.00, 73.1% for Level 2.00, 71.5% for Level 3.00, 60.0% for Level 4.00, 100.0% for Level 5.00, and 75.0% for Level 6.00.

significant difference between the objectives outlined in curriculum guides and those items tested on the Public Examinations in Geography for Grades IX and X.

A combined total of 1,058 items were derived from the Grades IX and X geography curriculum guides and from the Public Examinations in Geography. Of this total, 319 items were derived from the curriculum guides; while 739 items were obtained from the Public Examinations. Each of these items was classified according to the major levels of Bloom's taxonomy. Level 1.00 of Bloom's taxonomy contained the greatest number of test items, while Level 2.00 contained the most curriculum guide objectives. The two lowest levels of Bloom's taxonomy accounted for 95.5% of the test items. In comparison, 74.6% of the curriculum guide objectives were assigned to the taxonomic levels of Knowledge and Comprehension. The curriculum guide objectives represented all levels of Bloom's taxonomy. However no test item was assigned to Level 6.00--Evaluation--which is the highest category of Bloom's taxonomy. The overall distribution of the population studied is presented in Table V.

To test the null form of the main hypothesis--that there would be no significant difference between the objectives outlined in the geography curriculum guides and those items tested on the Public Examinations in Geography for Grades IX and X--a Chi-square test of independence was performed. The same statistical procedure was also applied to the six sub hypotheses of this study. The data presented

in Table V gives both the observed and the expected frequencies for each taxonomic level. The expected frequency for each component of the test item column was obtained by multiplying the total for the test item column by the total for each of the six rows in turn. This product is then divided by the total number of items used in the study. The expected frequency for each component of the objectives column was also obtained in the same manner.

The Chi-square value of the data as presented in Table V was 242.63. Therefore the main null hypothesis was rejected at the .05 level of significance. This allowed the acceptance of the alternate form. There were significant differences between the objectives outlined in curriculum guides and those items tested on the Public Examination in Geography for Grades IX and X.

TABLE V

FREQUENCY DISTRIBUTION OF TEST ITEMS AND OBJECTIVES ACCORDING TO THE LEVELS OF BLOOM'S TAXONOMY

Taxonomy Levels	Test Items		Objectives		Total
	Observed	Expected	Observed	Expected	
Knowledge	579	482.66	112	208.34	691
Comprehension	127	176.72	126	76.28	253
Application	21	19.56	7	8.44	28
Analysis	3	24.45	32	10.55	35
Synthesis	9	23.75	25	10.25	34
Evaluation	0	11.87	17	5.13	17
TOTAL	739	739.00	319	319.00	1,058

$\chi^2 = 242.63$ $\quad df = 5$ $\quad P < .001$

Sub Hypothesis 1

Table VI indicates the number of items on Public Examinations and in geography curriculum guides that were assigned to Level 1.00 of Bloom's taxonomy. However attention should be drawn to the fact that both the observed and expected frequencies for each of the six sub hypotheses were derived from Table V, which was used in testing the main hypothesis of this study. The first null sub hypothesis stated that there would be no significant difference between the number of Knowledge items found on the Public Examinations in Geography, and those outlined in the geography curriculum guides. To test this null hypothesis, a Chi-square test of independence was performed. The resulting Chi-square value of 63.78 showed there were significantly more Knowledge items found on the Public Examinations in Geography than in the geography curriculum guides. Therefore on the basis of the data gathered by this study the null form of sub hypothesis 1 was rejected at the .05 level of significance. This allowed the acceptance of the alternate form. There were signficant differences between the number of Knowledge items found on the Public Examinations in Geography, and those outlined in the geography curriculum guides.

TABLE VI

NUMBER OF PUBLIC EXAMINATION AND CURRICULUM GUIDE ITEMS ASSIGNED TO LEVEL 1.00 OF BLOOM'S TAXONOMY

	Frequencies	
	Observed	Expected
Test Items	579	482.66
Curriculum Guide Objectives	112	208.34

$\chi^2 = 63.78$ df = 1 P < .001

Sub Hypothesis 2

This hypothesis stated that there would be significantly more Comprehension items found in the geography curriculum guides than on the Public Examinations in Geography. The resulting Chi-square value obtained from testing the null form of this hypothesis--that there would be no significant difference between the number of Comprehension items found in the geography curriculum guides and those tested on the Public Examinations in Geography--was 46.38. Therefore the null form of sub hypothesis 2 was rejected at the .05 level of significance, thus allowing the acceptance of the alternate form. A total of 126 curriculum guide items and 127 Public Examination items have been assigned to Level 2.00, they are presented in Table VII.

TABLE VII

NUMBER OF PUBLIC EXAMINATION AND CURRICULUM GUIDE ITEMS ASSIGNED TO LEVEL 2.00 OF BLOOM'S TAXONOMY

	Frequencies	
	Observed	Expected
Test Items	127	176.72
Curriculum Guide Objectives	126	76.28

$\chi^2 = 46.38$ df = 1 P < .001

Sub Hypothesis 3

The null form of sub hypothesis 3 stated that there would be no significant difference between the number of Application items found in the geography curriculum guides and those tested on the Public Examinations in Geography. Data pertinent to this sub hypothesis has been outlined in Table VIII. However the resulting Chi-square value of .34 showed there was indeed no significant difference between the number of Public Examination items assigned to Level 3.00 and the number of curriculum guide objectives that were assigned to the same taxonomic level. The null form of sub hypothesis 3 was not rejected at the .05 level of significance. The hypothesis--that there would be significantly more Application items found in the geography curriculum guides than on the Public Examinations in Geography--was therefore rejected.

TABLE VIII

NUMBER OF PUBLIC EXAMINATION AND CURRICULUM GUIDE ITEMS ASSIGNED TO LEVEL 3.00 OF BLOOM'S TAXONOMY

	Frequencies	
	Observed	Expected
Test Items	21	19.56
Curriculum Guide Objectives	7	8.44

$\chi^2 = .34$ df = 1 P < .05

Sub Hypothesis 4

This hypothesis stated that there would be significantly more Analysis items found in the geography curriculum guides than on the Public Examinations in Geography. The number of items on Public Examinations and in curriculum guides that were assigned to Level 4.00 of Bloom's taxonomy have been summarized in Table IX. The null form of this sub hypothesis stated that there would be no significant difference between the number of Analysis items found in the geography curriculum guides and those tested on the Public Examinations in Geography. The calculated value for Chi-square was 62.42. With one degree of freedom a value of Chi-square equal to or greater than 3.841 is required for significance at the .05 level. Therefore, the obtained Chi-square is significant and the null hypothesis was rejected, thus allowing the acceptance of the alternate form.

TABLE IX

NUMBER OF PUBLIC EXAMINATION AND CURRICULUM GUIDE ITEMS ASSIGNED TO LEVEL 4.00 OF BLOOM'S TAXONOMY

	Frequencies	
	Observed	Expected
Test Items	3	24.45
Curriculum Guide Objectives	32	10.55

$\chi^2 = 62.42$ df = 1 P < .001

Sub Hypothesis 5

Table X indicates the number of items on Public Examinations and in geography curriculum guides that were assigned to Level 5.00 of Bloom's taxonomy. The null form of the fifth sub hypothesis stated that there would be no significant difference between the number of Synthesis items found in the geography curriculum guides and those tested on the Public Examinations in Geography. The resulting Chi-square value of 30.38 showed that there were significantly more Synthesis items found in the geography curriculum guides than on the Public Examinations in Geography. Therefore the null form of sub hypothesis 5 was rejected at the .05 level of significance. The hypothesis--there was significantly more Synthesis items found in the geography curriculum guides than on the Public Examinations in Geography--was therefore accepted.

TABLE X

NUMBER OF PUBLIC EXAMINATION AND CURRICULUM GUIDE ITEMS ASSIGNED TO LEVEL 5.00 OF BLOOM'S TAXONOMY

	Frequencies	
	Observed	Expected
Test Items	9	23.75
Curriculum Guide Objectives	25	10.25

$\chi^2 = 30.38$ df = 1 P < .001

Sub Hypothesis 6

The sixth sub hypothesis stated that there was significantly more Evaluation items found in the geography curriculum guides than on the Public Examinations in Geography. Data pertinent to the null form of this hypothesis--that there is no significant difference between the number of Evaluation items found in the geography curriculum guides and those items tested on the Public Examinations in Geography--have been summarized in Table XI. A Chi-square value of 39.33 showed that there was a significant difference between the number of curriculum guide objectives that were assigned to Level 6.00 and the number of test items that were assigned to the same taxonomic level. Therefore, the null form of sub hypothesis 6 was rejected at the .05 level of significance, thus allowing the acceptance of the alternate form.

TABLE XI

NUMBER OF PUBLIC EXAMINATION AND CURRICULUM GUIDE ITEMS ASSIGNED TO LEVEL 6.00 OF BLOOM'S TAXONOMY

	Frequencies	
	Observed	Expected
Test Items	0	11.87
Curriculum Guide Objectives	17	5.13

$\chi^2 = 39.33$ df = 1 P < .001

SUMMARY

The preliminary investigation undertaken by the researcher solved the problem of placing an appropriate behavioural interpretation on the original objectives outlined in the geography curriculum guides. On completion of the preliminary investigation the researcher proceeded with the pilot study. A panel of three judges rated a sample questionnaire consisting of 104 items, and the percentage of agreement between the three judges and the researcher was 83.0%. However the percentages of agreement were higher on the three lower levels of the taxonomy than they were for the three upper levels. Consequently, a second revised questionnaire consisting of a stratified sample of 50 items covering the six levels of Bloom's taxonomy was forwarded to the three judges for their classification. The results of this second questionnaire showed a considerable improvement

in the percentages of agreement obtained for the three upper levels of Bloom's taxonomy. At the same time a high percentage of agreement was retained on the two lower levels. However the number of items classified according to Level 3.00 declined because the judges felt that such behavioural terms as "estimate", and "predict" were more indicative of Comprehension since they went one step beyond remembering but still represented the lowest level of understanding. Therefore the researcher accepted this viewpoint of the judges in conducting the main study.

Apart from the main hypothesis, there were also six sub hypotheses. Each hypothesis was stated in null form and tested by means of a Chi-square test of independence. The main hypothesis was accepted at the .05 level of significance, as significant differences were found to exist between the objectives outlined in curriculum guides and those items tested on the Public Examinations in Geography for Grades IX and X. Five of the six sub hypotheses were also accepted. Only sub hypothesis 3 yielded no significant difference between the curriculum guide objectives and the test items even though one had been predicted. A discussion of these findings is presented in Chapter 5.

Chapter 5

DISCUSSION OF THE RESULTS

MAJOR HYPOTHESIS

This study sought to determine if there was a significant difference between the objectives outlined in geography curriculum guides and those items tested on the Public Examinations in Geography for Grades IX and X, as shown by the use of Bloom's Taxonomy of Educational Objectives: Cognitive Domain. The results of the Chi-square test of independence caused the researcher to reject the null form of the above hypothesis, and to accept the alternate form. Of the 739 test items classified, 78.4% fell in Level 1.00 of Bloom's taxonomy. In comparison, only 35.1% of the curriculum guide objectives fell in the same taxonomic category. Such a heavy concentration of test items on one taxonomic level indicates that Public Examinations in Geography often stress the recall of factual content. This high percentage of test items on the Knowledge level of Bloom's taxonomy is similar to the findings of other studies, such as the one conducted by Pancella (1970). Pancella classified 2,689 biology test items, and found that 71.9% were at the Knowledge level of Bloom's taxonomy.

Evidently, the Public Examinations in Geography have

neglected those taxonomic levels which refer to intellectual skills and abilities. In fact, only 21.6% of the total number of test items that were classified, fell in the taxonomic categories which required the pupil to utilize his intellectual skills and abilities.

In comparison to the Public Examination items, the curriculum guide objectives do not emphasize the Knowledge level of Bloom's taxonomy to the same extent, as 64.9% of the objectives were assigned to the other taxonomic levels. The curriculum guide objectives were distributed throughout all levels of Bloom's taxonomy, with the three upper levels accounting for 23.2% of the total number classified. Only 1.6% of the Public Examination questions make reference to the taxonomic levels of Analysis and Synthesis; while there were no Public Examination items referring to Evaluation, the taxonomic category that required the pupil to judge the value of material. A comparative summary of the curriculum guide percentages and the test item percentages is presented in Table XII. It is interesting to note that 2.8% of the test items and 2.2% of the curriculum guide objectives were assigned to Level 3.00 of Bloom's taxonomy, and this represented the most favourable percentage of agreement between test items and curriculum guide objectives.

TABLE XII

PERCENTAGE OF TEST ITEMS AND CURRICULUM GUIDE OBJECTIVES ASSIGNED TO EACH TAXONOMIC LEVEL

Taxonomy Levels	Test Items	Curriculum Guide Objectives
Knowledge	78.4%	35.1%
Comprehension	17.2	39.5
Application	2.8	2.2
Analysis	.4	10.0
Synthesis	1.2	7.9
Evaluation	0.0	5.3
TOTAL	100.0%	100.0%

SUB HYPOTHESES

Sub Hypothesis 1

Sub hypothesis 1 was rejected because there were significantly more Knowledge items on the Public Examinations in Geography than in the geography curriculum guides. Usually tests reflect the objectives held by the teachers who construct the examinations, even when the course objectives remain unstated (Pfeiffer & Davis, 1965). If such is the case, then Public Examinations in Geography for the province of Newfoundland have emphasized the recall of factual information far too long. Most students are "test conscious" to some extent, and as they review for examinations they tend to focus their efforts on the kinds of materials which they expect the examination questions to require. Just as the

students are "test conscious", so are most of their teachers. Often, the latter aim to finish the prescribed course of study in the minimum amount of time, so that a thorough review of the Department of Education's 'red books', containing copies of past Public Examinations, might be conducted. Such a procedure has been a very common practice in most Newfoundland high schools, because the criterion of a successful teacher was the number of pupils that passed the Public Examination.

One of the functions of Geography, as a school subject, is to provide an intellectual training for the pupil

> by its emphasis upon correlations that may be established between different distributions, by its encouragement of observational work, by its insistence on the study and interpretation of maps, and by its stimulation of the pupils' critical faculties (Teachers' Manual, 1964, p. iii).

However, the intellectual function of Geography has been sadly neglected, as Public Examinations in that subject have seldom required students to think beyond the recall of factual information or to apply their knowledge in a viable situation. The higher thinking processes of Analysis, Synthesis, and Evaluation have been ignored, for all intents and purposes.

Sub Hypothesis 2

The null form of this hypothesis was rejected, as there was a significant difference between the number of Comprehension items found on the Public Examinations in

Geography and those outlined in the geography curriculum guides. There were 127 test items assigned to Level 2.00 and this represented 17.2% of the total number of test items assigned to the six levels of Bloom's taxonomy. However many of the test items that were assigned to Level 2.00--Comprehension--were characterized by terminology which required the pupil to explain why certain geographical factors were prominent. In most instances these questions required only a short answer on the student's part. In comparison, there were 126 curriculum guide objectives assigned to Level 2.00. This represented 39.5% of the total number of curriculum guide objectives assigned to the six levels of Bloom's taxonomy. Usually test items expected the pupil to change his thinking from verbal to pictorial, in order to outline such things as the location of a country, its industries, and its cities on a map. In contrast, the curriculum guide objectives were much more diverse as they expected the pupil to be capable of performing in a greater variety of ways as a result of having completed the prescribed course of study.

Sub Hypothesis 3

Sub hypothesis 3 predicted that there would be significantly more Application items found in the geography curriculum guides than on the Public Examinations in Geography. However the resulting Chi-square value of .34 showed that there was no significant difference between the number of

test items and curriculum guide objectives that were assigned to Level 3.00. Therefore the alternate form of sub hypothesis 3 was accepted at the .05 level of significance.

Interestingly enough, the most favourable percentage of agreement between test items and curriculum guide objectives was obtained on this taxonomic level. All Public Examination items that were assigned to Level 3.00 of Bloom's taxonomy required the pupil to draw a diagram or figure to illustrate some geographical feature. Typical examination questions were those that required the pupil to illustrate the contour lines of a mountain, to illustrate the direction of the major winds over the earth's surface, and to illustrate how the monsoon winds affect the land surface of Asia. Based upon personal experience, such geographical situations were seldom taught verbatim by the teacher in the classroom; although similar situations and problems might have been used in the lessons. It could be argued that the pupil needed only to recall facts in order to answer such an item on the Public Examination. However in practice, the pupil would need to recall the procedure for solving such a problem and then apply this knowledge to the existing data in order to effect a solution. Curriculum guide objectives that were assigned to Level 3.00 usually referred to the pupils ability to use learned material in new and concrete situations.

Sub Hypotheses 4, 5, 6

These three hypotheses have been combined because

they refer to the higher thinking processes of Analysis, Synthesis, and Evaluation. The null form of each hypothesis was rejected because significant differences were found to exist between the number of items found in the curriculum guides and those items tested on the Public Examinations in Geography. Only 12, or 1.6%, of the 739 test items were classified according to the three upper levels of Bloom's taxonomy; while 74, or 23.2%, of the 319 curriculum guide objectives were assigned to the same taxonomic levels. Therefore, it can be concluded that pupils were seldom asked to analyze, synthesize, or evaluate material. In comparison to the test items, the geography curriculum guides have listed objectives which relate to the higher cognitive processes. However on the basis of the data gathered in this study it is apparent that the setters of the Public Examinations in Geography have ignored those questions which require the pupil to utilize the higher levels of cognition. Instead the Public Examinations in Geography analyzed in this study have emphasized the objective of knowledge acquisiton and the mental process of memory. Based upon personal experience, the researcher has noticed that the items tested on the Public Examinations in Geography have repeatedly required the students to recall factual information in essentially the same form as it was outlined in the textbook. Bloom (1956) has described "comprehension" as the lowest form of intellectual activity. Therefore the previous observations are very discouraging in light of the generally held objective

for the social studies to foster critical thinking. Possession of knowledge is essential, if the pupil is to employ it effectively in higher mental operations. Knowledge is also a prerequisite to thinking, therefore questions requiring memory will be essential (Davis & Tinsley, 1967). However to stress the importance of knowledge while excluding attention to the other cognitive areas, is definitely misleading. Undoubtedly more deliberate attention has to be given to the higher cognitive objectives outlined in the Grades IX and X geography curriculum guides. At the present time this apparent overall lack of concern for the objectives in the areas of Analysis, Synthesis, and Evaluation could be interpreted to mean that Newfoundland pupils in Grades IX and X have been intellectually deprived, at least on the Public Examinations, of the opportunity to think critically and to express their originality.

SUMMARY

On the basis of the data gathered for this study it is apparent that the Public Examinations in Geography over emphasize the lower levels of the cognitive process, and tend to show an overall lack of concern for the higher cognitive levels. Probably part of the reason for this emphasis is the ease of testing for recall of facts, and the apparent reluctance of the setters of the geography Public Examination to test for higher level cognition.

Chapter 6

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

SUMMARY OF PROCEDURE

The Problem

The purpose of this study was to determine if there was a discrepancy as identified by Bloom's Taxonomy of Educational Objectives: Cognitive Domain between the objectives as stated in Newfoundland geography curriculum guides and those objectives tested on Public Examinations in Geography for Grades IX and X.

Underlying the main problem were two sub-problems that had to be solved prior to conducting the actual study:

1. Is the Taxonomy of Educational Objectives: Cognitive Domain an effective instrument in analyzing objectives stated in curriculum guides?
2. Is the Taxonomy of Educational Objectives: Cognitive Domain an effective instrument in analyzing the items tested on Public Examinations in Geography for Grades IX and X for Newfoundland?

Hypotheses

From these problems one major hypothesis was formulated:

The use of the Taxonomy of Educational Objectives:

Cognitive Domain will indicate that there is a significant difference between the objectives outlined in curriculum guides and those items tested on the Public Examinations in Geography for Grades IX and X.

Apart from the main hypothesis, there were six sub hypotheses that were also tested:

Hypothesis 1

There will be significantly more Knowledge items found on the Public Examinations in Geography, than in the geography curriculum guides.

Hypothesis 2

There will be significantly more Comprehension items found in the geography curriculum guides, than on the Public Examinations in Geography.

Hypothesis 3

There will be significantly more Application items found in the geography curriculum guides, than on the Public Examinations in Geography.

Hypothesis 4

There will be significantly more Analysis items found in the geography curriculum guides, than on the Public Examinations in Geography.

Hypothesis 5

There will be significantly more Synthesis items

found in the geography curriculum guides, than on the Public Examinations in Geography.

Hypothesis 6

There will be significantly more Evaluation items found in the geography curriculum guides, than on the Public Examinations in Geography.

Instrumentation and Design

To test the hypotheses, Bloom's Taxonomy of Educational Objectives: Cognitive Domain was utilized to classify 1,058 items derived from the Grades IX and X geography curriculum guides and from the Public Examinations in Geography that were administered between 1960-1969. Prior to the main study, a preliminary investigation was conducted in order to find out if Bloom's taxonomy could be used to classify curriculum guide objectives. This procedure was adopted by the researcher because he could find no reference, in the related literature, of Bloom's taxonomy being used to classify curriculum guide objectives. However the results of the preliminary questionnaire that was administered to the three judges outlined serious problems that would have to be rectified if Bloom's taxonomy was to be utilized in the main study. The most serious problem was the assigning of an appropriate behavioural interpretation to the original objectives as stated in the curriculum guides. Once this problem had been solved, the researcher had to answer the question of whether or not his behavioural

interpretation still retained the original meaning of the curriculum guide objectives. This question was resolved by soliciting the assistance of Grade IX geography teachers, who validated the researcher's behavioural interpretation of the objectives that were outlined in the geography curriculum guides.

In conducting the pilot study, the researcher submitted two questionnaires to the three judges for their classification according to the six major levels of Bloom's taxonomy. The first questionnaire consisted of 104 items that were randomly selected from the curriculum guide objectives and test items in Geography. The results of this questionnaire showed that agreement was higher for the lower levels of Bloom's taxonomy than for the upper levels. Consequently the researcher requested the three judges to independently complete a second questionnaire. This questionnaire consisted of a stratified sample of 50 items that represented all levels of Bloom's taxonomy. Results of this questionnaire showed an improvement in percentages of agreement between the researcher and the three judges on the higher levels of Bloom's taxonomy.

Actual testing of the hypothesis and the six sub hypotheses, was carried out by the use of a Chi-square test of independence, with .05 being the accepted level of significance. The null form of the main hypothesis was rejected. A similar result was obtained for five of the six null sub hypotheses. Only null sub hypothesis 3 was accepted

after the statistical analysis was completed.

The Sample

The sample studied consisted of all the objectives outlined in the Grades IX and X geography curriculum guides, and all the items tested on the Grades IX and X geography Public Examinations, administered between 1960-1969. A total of 319 curriculum guide objectives and 739 test items were analyzed, and then classified according to the six major levels of Bloom's taxonomy.

CONCLUSIONS

The findings of the analysis of data lend support to the following conclusions:

1. There is a discrepancy between Public Examination items in Geography for Grades IX and X and the objectives stated in the respective geography curriculum guides. Public Examinations in Geography primarily emphasized the pupils' ability to recall factual information that had been previously stated in the textbook. By comparison, the curriculum guides emphasized the higher cognitive processes as well as the development of memory skills.
2. Bloom's Taxonomy of Educational Objectives: Cognitive Domain is an effective research instrument in analyzing behavioural interpretations of objectives stated in curriculum guides.

3. Bloom's Taxonomy of Educational Objectives: Cognitive Domain is an effective research instrument in analyzing the items tested on Public Examinations in Geography for Grades IX and X for Newfoundland.
4. Judges can agree on the taxonomic classification of curriculum guide objectives and test items for a course of study, provided that they know or assume the circumstances under which the course is taught.

RECOMMENDATIONS FOR FURTHER RESEARCH

Several suggestions can be made for further research:

1. Bloom's Taxonomy of Educational Objectives: Cognitive Domain should be applied to other social studies subjects taught in Newfoundland schools, and also to other subjects tested on the Public Examinations.
2. A future comparative study could be done comparing the Public Examinations with the examinations administered by teachers during the five year moratorium.
3. Taba has pointed out that tests, and test results, should be part of a complete and well-planned process. If intellectual abilities and skills are to be assessed, then the teaching practices must show evidence that they provide for the acquisition of these skills and abilities. Therefore, there exists a need for a study, investigating the

actual teaching situations which test results are intended to reflect.

B I B L I O G R A P H Y

BIBLIOGRAPHY

Arasarkadavil, Denis J. The Secondary School Leaving Examination in India, A Case Study of the Validity of the School Leaving Examination in Kerala State. New York: Asia Publishing House, 1963.

Arkin, Herbert, and Cotton, Raymond R. Tables for Statisticians. New York: Barnes and Noble, Inc., 1968.

Berg, Harry D. Evaluation in Social Studies. The Thirty-Fifth Yearbook of the National Council for the Social Studies, Washington, D.C., 1965.

Bloom, Benjamin S. (ed.). Taxonomy of Educational Objectives, Handbook I: Cognitive Domain. New York: David McKay Company, Inc., 1956.

Braine, Linda B. "An Historical Study of the Social Studies Curriculum in Newfoundland." Unpublished Master's thesis, University of Alberta, Edmonton, 1964.

Carroll, Charles R. "An Application of the 'Taxonomy of Educational Objectives' to Alcohol Education." Unpublished doctoral dissertation, Ohio State University, Columbus, 1965.

Chambers, W. M. "Testing and Its Relationship to Educational Objectives," Journal of General Education, 16:246-249, July, 1964.

Cox, Richard C. "Item Selection Techniques and Evaluation of Instructional Objectives," Journal of Educational Measurement, 2(2):181-187, February, 1965.

_____, and Unks, Nancy J. A Selected and Annotated Bibliography of Studies Concerning the Taxonomy of Educational Objectives: Cognitive Domain. Learning Research and Development Center, University of Pittsburgh, June, 1967.

Davis, O. L., and Tinsley, D. C. "Cognitive Objectives Revealed by Classroom Questions Asked by Social Studies Student Teachers," Peabody Journal of Education, 45:21-26, July, 1967.

_____, and Hunkins, Francis P. "Testbook Questions: What Thinking Processes Do They Foster," Peabody Journal of Education, 43:285-292, March, 1966.

Department of Education, Province of Newfoundland and Labrador, Newsletter, St. John's: September, 1970.

_____, A Teaching Guide to Geography in Grades IX, X, and XI, St. John's: Division of Curriculum, August, 1964.

Elliott, C. B. "Cognitive Dimensions of Lesson Objectives Set by Secondary Student Teachers." Unpublished Master's thesis, Kent State University, 1965.

Ellis, John K. "The Application of the Taxonomy of Educational Objectives to the Determination of Objectives for Health Education." Unpublished doctoral dissertation, University of Michigan, 1963.

Evans, Lloyd R., *et al.*, "The Reliability, Validity, and Taxonomic Structure of the Oral Examination," Journal of Medical Education, 41:651-657, July, 1966.

Farley, George T., and Clegg, Ambrose A. "Increasing the Cognitive Level of Classroom Questions in Social Studies: An Application of Bloom's Taxonomy." Paper read at the Annual Meeting of the American Educational Research Association, Los Angeles, California, February 5-8, 1969.

Ferguson, George A. Statistical Analysis in Psychology and Education. New York: McGraw-Hill Book Co., 1966.

Floyd, W. D. "An Analysis of the Oral Questioning Activity in Selected Colorado Primary Classrooms." Unpublished doctoral dissertation, Colorado State College, Greeley, Colorado, 1960.

Foster, Harriet. Categories of Cognitive Skills. Center for the Study of Evaluation of Instructional Programs, California University, Los Angeles, November, 1966.

Gallagher, James J. "Analyses of Teacher Classroom Strategies Associated With Student Cognitive and Affective Performance." Paper presented to the United States Office of Education, Washington, D.C., June, 1968.

_____. "Expressive Thought by Gifted Children in the Classroom," Elementary English, 42:559-568, May, 1965.

Gronlund, Norman E. Stating Behavioural Objectives for Classroom Instruction. Toronto: The McMillan Co., Ltd., 1970.

Gushue, William J. "Technological Progress and Education," Newfoundland Teacher's Association Journal, 55:57-62, February, 1964.

Herron, J. Dudley. "Evaluation and the New Curricula," Journal of Research in Science Teaching, 4:157-170, September, 1966.

Hickman, George A. "The History of Education in Newfoundland." Unpublished Master's thesis, Mount Allison University, Sackville, 1941.

Huenicke, Dorothy. "Cognitive Levels of Teacher Objectives and Oral Classroom Questions for Curriculum Guide Users and Non-Users," Educational Leadership, 27: 379-383, January, 1970.

Jarolimek, John. "The Taxonomy: A Guide to Differentiated Instruction," Social Education, 26:445-447, December, 1962.

Klein, M. Frances. "Evaluation of Instruction: Measurement of Cognitive Behaviour as Defined by the Taxonomy of Educational Objectives." Unpublished doctoral dissertation, University of California at Los Angeles, 1965.

Krathwohl, David R. "Stating Objectives Appropriately for Program, for Curriculum, and for Instructional Materials Development," Journal of Teacher Education, 16:83-92, March, 1965.

Kropp, R. P., Stoker, H. W., and Bashaw, W. L. "The Validation of the Taxonomy of Educational Objectives," Journal of Experimental Education, 34(3):69-76, Spring, 1966.

Mager, Robert F. Preparing Instructional Objectives. Palo Alto, California: Fearon Publishers, 1962.

Metfessel, Newton, *et al.*, "Instrumentation of Bloom's and Krathwohl's Taxonomies for the Writing of Educational Objectives." Paper read at the Annual Meeting of the American Educational Research Association, Los Angeles, California, February 5-8, 1969.

Miller, G. E., *et al.*, "The Orthopaedic Training Study--A Progress Report," Bulletin of the American Academy of Orthopaedic Surgery, 13:8-11, December, 1965.

Openshaw, M. Karl, *et al.*, "The Development of a Taxonomy for the Classification of Teacher Classroom Behaviour." Report presented to the Ohio State University Research Foundation, Columbus, January, 1967.

Pace, C. Robert. "Educational Objectives," The Integration of Educational Experiences. The Fifty-Seventh Yearbook of the National Society for the Study of Education, Part II, Chicago: University of Chicago Press, 1958.

Pancella, John R. "The Use of the Taxonomy of Educational Objectives: Cognitive Domain to Analyze and Describe Standardized and Commercial Tenth Grade Biology Examinations." Unpublished doctoral dissertation, University of Maryland, 1970.

Payne, David A. The Specification and Measurement of Learning Outcomes. Toronto: Ginn and Co., 1968.

Pfeiffer, Isobel, and Davis, O. L. "Teacher-Made Examinations: What Kinds of Thinking Do They Demand?," National Association of Secondary School Principals Bulletin, 49:1-10, September, 1965.

_____, and Hunkins, Frances P. "Bloom's Taxonomy: A Stimulus to Better Teaching," Ideas Educational, 3(2):11-17, Spring, 1965.

Poole, Richard L. "Characteristics of the Taxonomy of Educational Objectives: Cognitive Domain," Psychology in The Schools, 8(4):379-385, October, 1971.

Province of Newfoundland and Labrador, Report of the Royal Commission on Education and Youth, Volume One, St. John's: April, 1967.

Rowe, Frederick W. The Development of Education in Newfoundland. Toronto: The Ryerson Press, 1964.

Sanders, Norris. Classroom Questions: What Kinds? New York: Harper and Row Book Co., 1966.

Scannell, D. P., and Stellwagen, W. R. "Teaching and Testing For Degrees of Understanding," California Journal of Instructional Improvement, 3(1).

Siegel, Sidney. Non-Parametric Statistics for the Behavioural Sciences. New York: McGraw-Hill Book Co., 1956.

Skager, R. Cognitive Skills, A Consideration in Evaluating Instructional Effects. Center for the Study of Evaluation and Instructional Programs, University of California at Los Angeles, January, 1968.

Smith, F. R., and Cox, B. C. New Strategies and Curriculum in Social Studies. Chicago: Rand, McNally and Co., 1969.

Smith, Leon I. "I.Q., Creativity, and the Taxonomy of Educational Objectives: Cognitive Domain," Journal of Experimental Education, 38(4):58-60, Summer, 1970.

Smith, R. B. "An Empirical Examination of the Assumptions Underlying the Taxonomy of Educational Objectives: Cognitive Domain," Journal of Educational Measurement, 5:125-128, Summer, 1968.

_____, and Paterson, J. "A Measurement Problem in Applying the Principles of the Taxonomy of Educational Objectives," Psychology in The Schools, 2:364-368, October, 1965.

Spencer, Sister Doreen. "Relevance of Questions on Grade IX English Literature Examinations, June 1968, for the Province of Newfoundland to Professed Objectives." Unpublished Master's thesis, Memorial University of Newfoundland, St. John's, 1970.

Stanley, J. C., and Bolton, D. L. "Review of B. S. Bloom (ed.), 'Taxonomy of Educational Objectives, Handbook I: Cognitive Domain' and J. R. Gerberich, 'Specimen Objective Test Items', A Guide to Achievement Test Construction," Journal of Educational and Psychological Measurement, 17(4):631-634, Winter, 1957.

Stoker, H. W., and Kropp, R. P. "Measurement of Cognitive Processes," Journal of Educational Measurement, 1:39-43, June, 1964.

Taba, Hilda. Curriculum Development: Theory and Practice. New York: Harcourt, Brace and World, Inc., 1962.

Tyler, Louise L., and Okumu, Laura J. "A Beginning Step: A System for Analyzing Courses in Teacher Education," Journal of Teacher Education, 16(4):438-444, December, 1965.

Webb, Jeaninne N. "Taxonomy of Cognitive Behaviour: A System for the Analysis of Intellectual Processes," Journal of Research and Development in Education, 4(1):23-33, Fall, 1970.

Williams, Tony L. "The Effect of Cognitive Instructions on Secondary Student Teachers and Their Pupils," Journal of Research and Development in Education, 4(1):73-83, Fall, 1970.

APPENDICES

APPENDIX A

Letters from the Offices of the Superintendents of Education for St. John's

TELEPHONE 726-8400

Roman Catholic School Board for St. John's

BELVEDERE
BONAVENTURE AVENUE
ST. JOHN'S, NEWFOUNDLAND

February 2, 1972

Mr. W. Wayne Mercer,
Dept. of Curriculum & Instruction,
Memorial University of Newfoundland,
St. John's.

Dear Mr. Mercer:

Re: Your Letter of January 28, 1972.

Permission is hereby granted to you to solicit the assistance of Grade IX teachers in preparing your thesis for the Master's Degree in Education. This permission is granted with the understanding that Grade IX teachers and their principals will participate on a voluntary basis and that students are not involved in the study. A copy of the school directory is enclosed; those schools checked have Grade Nine classes.

With every good wish for success in your university studies, I remain,

Yours sincerely,

F. J. Kearsey,
Superintendent of Education.

FJK/mm

Encl:

The Avalon Consolidated School Board

100

P. O. BOX 1980
ST. JOHN'S, NEWFOUNDLAND

February 7th, 1972.

Mr. W. Wayne Mercer,
Department of Curriculum & Instruction,
Memorial University of Newfoundland,
ST. JOHN'S, Newfoundland.

Dear Mr. Mercer,

Thank you for your letter of January 31st, 1972.

On behalf of the Avalon Consolidated School Board, I hereby authorize you to solicit the assistance of Grade IX Geography teachers in the preparation of your thesis.

The schools operated by the Avalon Consolidated School Board are listed under Avalon Consolidated School Board in the telephone directory with their addresses and telephone numbers.

Yours truly,

G. B. March,
Superintendent.

GBM/cw

APPENDIX B

The Population studied by the Researcher

The following four sections contain the items that have been derived from the Grades IX and X geography curriculum guides, and from the Grades IX and X Public Examinations in Geography.

APPENDIX B - SECTION 1

The following are behavioural representations of the objectives outlined in the Grade IX curriculum guide for Geography.

1. Through careful study of a globe or map of the world the student is able to point out that Europe and Asia do not have any sharply defined topographical dividing line.

2. By means of pictures the student is able to give examples of the great contrasts that exist in Europe and Asia in respect to their environmental, economical, social, and cultural aspects.

3. Given a list of the different races of people to be found in Canada, the student must be able to relate them to the many ancestral backgrounds that prevail throughout Eurasia.

4. Through the careful study of maps the student is able to point out where the main continents are connected to or are near one another.

5. Through the careful study of maps the student is able to state that Eurasia is the 'Heartland of the World'.

6. To be able to list in order of geographical size the chief islands that lie off the shores of Eurasia.

7. To be able to contrast world ocean routes with the main world airways.

8. To be able to compare and contrast the size of Eurasia and its position on the globe, especially in relation to Canada.

9. To be able to construct dot maps.

10. To be able to explain dot maps.

11. Through the study of a population map of the world the student is able to write an account of what parts of Eurasia are most densely populated.

12. To be able to list the crowded agricultural lands as well as the crowded industrial areas of Eurasia.

13. On a map of Europe and Asia be able to locate and name the 'cradles of civilization'.

14. To be able to explain how certain geographical conditions helped some peoples to progress, while other peoples were hindered.

15. To be able to distinguish between the similarities and the differences that prevail among the peoples of Eurasia in terms of language, race, and religion.

16. To be able to outline the factors that make Europe the greatest "melting pot" in the world.

17. Through the study of both relief and vegetative maps on Eurasia be able to compare and contrast what the land surface of Eurasia looks like in crossing the double continent first from west to east and then from south to north.

18. By studying climatic graphs of Eurasia the student is able to distinguish between the great contrasts in weather that exist at the same time in different parts of Eurasia.

19. To be able to state the ways in which weather conditions are recorded, mapped, and read.

20. Through the study of climatic graphs the student is able to explain the temperature and rainfall conditions of Eurasia.

21. To be able to describe the main vegetation and soil areas of Eurasia.

22. To be able to point out the major characteristics of the main vegetation and soil areas of Eurasia.

23. With the aid of pictures be able to show what it would be like to live in each area of Eurasia.

24. To be able to identify on a map the general location of where each of these areas are found in Eurasia.

25. To be able to relate the extent and importance of some valuable plants from Eurasia.

26. To be able to summarize the geographical factors that have made Britain an important country.

27. To be able to give examples of the regional differences that exist in Great Britain.

28. To be able to list the chief points of interest about London.

29. To be able to break down the geographical features of the following regions: South-west England, East Anglia, Wessex, the South-east, the English Midlands, Wales and the Welsh borders, Lancashire, the Lake District, and North-east England.

30. To be able to list where most of the peoples in Scotland and Ireland live and the reasons therefor.

31. To be able to state the importance of the Scottish Lowlands.

32. To be able to interpret the facts related to Ireland's economy.

33. To be able to list the factors that have modified the trade of the British Isles.

34. To be able to outline ways in which the Scandinavian peoples have made a success of their rugged land and its resources.

35. Through the study of maps and interpretation of pictures be able to explain the topography, the climate, and place names of the Scandinavian countries.

36. To be able to outline in a general manner what the land of France is like physically.

37. To be able to list the reasons why France is almost self-supporting.

38. To be able to explain the importance of Paris to the economy and culture of France.

39. To be able to list the ways in which one part of France is different from another part.

40. To be able to explain how France stands with respect to world power.

41. To be able to summarize in detail the particulars of the manufacturing industries and trade in France.

42. To be able to define what the French Union means.

43. With the aid of diagrams be able to outline the topographical nature of the "Low Countries".

44. To be able to outline the location of the "Low Countries" on a map or a globe.

45. To be able to explain how the Dutch people are providing more land and the uses to which it is put.

46. To be able to point out the activities that are going on in the big importing and exporting cities and in all of the manufacturing areas of Europe.

47. To be able to write an account of the Netherlands describing the location of the polders, the moorlands, the cities, the rivers, and the mining areas.

48. To be able to compile all the human factors involved in living in the Netherlands.

49. To be able to compare the relationships and the differences between the Benelux Countries.

50. To be able to show the comparisons and the connections between Newfoundland and the Netherlands.

51. Through the study of a map of Europe be able to outline the size and position of Switzerland.

52. Through the study of a physiographical map of Europe be able to construct a model of the kind of land where the Swiss live.

53. To be able to explain how the Swiss people make a living and why they are so successful at it.

54. To be able to point out the differences and similarities between Switzerland, France, Holland, and Newfoundland.

55. To be able to state why Switzerland is known internationally.

56. Through the use of a map or a globe be able to identify the geographical position of Germany.

57. To be able to list the main landforms of Germany.

58. To be able to name the great rivers of Germany.

59. To be able to outline the location of the large cities of Germany on a map.

60. To be able to explain why Germany is classed as a leading industrial nation.

61. To study the Ruhr region and be able to outline its connections with international trade, including that with Newfoundland.

62. To be able to explain the importance of the Rhine River as a great inland waterway of Europe.

63. To be able to specify how the tremendous output of German industry is moved from the factories to the markets.

64. To be able to outline the economic differences between the main areas of Germany.

65. To be able to explain the reasons for having coal, iron, steel, and other products shipped duty-free between Germany, Italy, France, Belgium, the Netherlands, and Switzerland.

66. To be able to list the trade difficulties of present day Germany.

67. By studying a vegetation map be able to identify the gradual change of conditions as one moves from Western to Eastern Europe.

68. To be able to explain how these different conditions have affected the lives of Eastern European peoples.

69. To be able to list the differences that occur as one moves from Western to Eastern Europe.

70. To be able to explain that the backwardness of eastern peoples is not due to lack of ability.

71. To be able to write an account of Poland with respect to present size, shape and position, its climate, landforms, its industries and its cities.

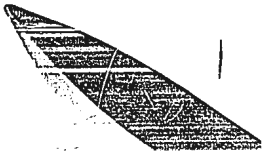
72. To be able to give examples of how Poland is gradually being changed.

73. To be able to describe briefly what type of people the Poles are.

74. Through the careful study of maps be able to describe the position, size, and shape of Czechoslovakia.

75. To be able to explain in detail the main physical features of Czechoslovakia.

76. To be able to state the importance of Czechoslovakia as a manufacturing and trading nation.



77. To be able to appraise the importance of the Danube River to European trade and commerce.

78. To be able to list the chief points of interest about the Danube River as a result of an imaginary trip from its source to its mouth.

79. To be able to outline the great historical significance of the lands around the Mediterranean Sea.

80. To be able to list the names of the countries that border the Mediterranean Sea.

81. To be able to compare and contrast the climate of Mediterranean lands with that of Newfoundland and of Canada generally.

82. To be able to relate the soil to the vegetation and crops grown in Mediterranean lands.

83. To be able to describe the conditions under which the farmers work in Mediterranean lands.

84. To be able to explain the effect of the Alps on Northern Italy.

85. To be able to summarize the differences in landforms, climate, types of people, and industrial activities as found in Italy.

86. To be able to list the specific geographical features of the Northern Plains of Italy.

87. To be able to state the historical importance of some of Italy's main cities.

88. To be able to name some of the achievements for which the people of Italy are well known.

89. To be able to appraise the progress made by Italian industry, even though the basic raw materials must be imported.

90. To be able to summarize Italy's main economic problems.

91. To be able to list ways in which Italy's economic problems could be lessened.

92. To be able to outline the location of the ten cross-road countries on a map or a globe.

93. To be able to name the ten crossroad countries.

94. To be able to describe briefly what the land and the climate of South-west Asia is like.

95. To be able to explain the economic changes that are taking place in the countries of South-west Asia.

96. To be able to state the basic facts of the oil industry.

97. To be able to outline the location of Turkey on the map.

98. To be able to list the reasons explaining where the population of Turkey lives.

99. To be able to explain how Turkey's industries are being helped through Western aid.

100. To be able to name the products that are grown on the land in Turkey.

101. To be able to list the minerals found in Turkey.

102. To be able to describe the particular importance of Istanbul (Constantinople) and Izmir.

103. To be able to point out that Iraq is the modern name for Mesopotamia, but that modern Iraq includes more territory than the land between the rivers.

104. To be able to assess the importance of the Euphrates and Tigris Rivers to the people of South-west Asia.

105. To be able to describe in general the economy of Iraq.

106. To be able to list the modern improvements in Iraq due to royalties on oil.

107. To be able to compare and contrast the U.S.S.R. with Canada in all its principal geographical aspects.

108. To be able to outline the position of the U.S.S.R. with respect to ocean ports.

109. To be able to list the significant facts with reference to the great rivers in Russia.

110. To be able to list the main areas of mountains, plateaus, and plains within the U.S.S.R.

111. To be able to differentiate between the broad vegetative areas found in Russia.

112. To be able to list the chief characteristics of the climate of the U.S.S.R.

113. To be able to state the main facts concerning the peoples who make up the Soviet Union.

114. To be able to tell the particulars of the U.S.S.R. with respect to the following: national resources, soils, coal, forests, oil, water power, iron ore, and other metals.

115. To be able to compare the relative importance of airways, waterways, and railways in the Soviet Union.

116. To be able to outline on a map the location of the areas where farming is carried on in the U.S.S.R.

117. To be able to describe the extent and conditions under which farming is carried on in the U.S.S.R.

118. To be able to list the kinds and extent of the products produced on the Soviet farms.

119. To be able to state the reasons underlying the change-over from small farming to collectives and co-operatives.

120. To be able to give an estimate of the success of farming in the U.S.S.R.

121. To be able to describe in detail how a collective farm operates.

122. To be able to describe in detail how Soviet citizens live in a farming village.

123. To be able to outline the nature of Russia's new industries.

124. To be able to explain the Russians five year plans and the reasons for locating particular industries in certain areas.

125. To be able to write a vivid account of what living is like in the areas around Tashkent and Alma-Ata.

126. To be able to outline what living is like in the taiga regions from a study of areas around Lake Onega on the Yenisei River, and in the Yakutsk area on the Lena River.

127. To be able to explain how the U.S.S.R. is developing and utilizing her tundra region.

128. To be able to judge the economic situation of the Soviet Union in the far east.

129. To be able to list the important facts about a representative number of cities in the U.S.S.R.

130. To be able to state the reasons for the growth and increase of modern cities in the Soviet Union.

131. To be able to appraise the Soviet cultural advances during the past thirty years.

132. To be able to identify on a map the various divisions of India and Pakistan both topographically and politically.

133. To be able to identify the chief geographical factors that determine the economic and social life of India and Pakistan.

134. To be able to appraise Great Britain's contribution to the progress of the sub-continent of India.

135. To be able to describe what it is like to live in the various areas of India.

136. To be able to describe in detail the conditions of farm life in India, the farmer's problems, and how assistance is being provided to help solve them.

137. To be able to list the chief foods grown and consumed in India and Pakistan.

138. To be able to list the chief foods grown in India and Pakistan for sale to other lands.

139. To be able to summarize the extent to which India and Pakistan are industrialized.

140. To be able to assess the economic and social problems of both India and Pakistan.

141. To be able to outline the location of the countries of South-east Asia on a map.

142. To be able to list the countries of South-east Asia.

143. To be able to outline the reasons for why there are so many islands in this area.

144. To be able to list the main economic concerns of the people in South-east Asia.

145. To be able to write an account of the people of South-east Asia, their varied modes of living and their occupations as determined by what the land can produce.

146. Through careful map study be able to explain the importance of South-east Asia in relation to sea and air routes to Japan and China.

147. To be able to describe the nature of the Burmese people.

148. To be able to outline the differences between the various geographical regions of Burma.

149. To be able to state the reasons why teak trees are so important to Burmese trade.

150. To be able to name the products that are grown to sell and consume in Burma.

151. To be able to describe the position and importance of Rangoon.

152. To be able to outline the geographical position of China on a map.

153. To be able to list the geographical regions of China.

154. To be able to describe the main climatic features of China.

155. To be able to justify the importance and influence of China's three great rivers.

156. To be able to give examples of how life is lived in the different regions of China.

157. To be able to name the minerals, land products, and industries of China.

158. To be able to outline on a map the position of the minerals, land products, and industries of China.

159. To be able to form an estimate of China's present and future possibilities as a great industrial nation.

160. To be able to outline the geographical position of Japan on a map.

161. To be able to name the islands that make up Japan.

162. To be able to name the seas that surround Japan.

163. To be able to explain the great differences that exist in living conditions in Japan.

164. To be able to analyze the social and economic background of present day Japan.

165. To be able to describe the origin and topography of the islands of Japan.

166. To be able to appraise the effect of ocean currents and winds on the Japanese climate.

167. To be able to outline the extent and uses of Japan's forests.

168. To be able to list the ways in which the land is used to produce rice and other crops.

169. To be able to explain the role that sea products play in Japan's economy.

170. To be able to outline Japan's position with respect to water power and metals.

171. To be able to state the nature of Japanese manufactures and trade.

172. To be able to state the nature of the Japanese transportation system.

173. To be able to describe in detail Japan's trade relations with Canada.

174. To be able to list the main facts of the principal cities of Japan.

175. To be able to describe the problem of over-population in Japan.

APPENDIX B - SECTION 2

The following are behavioral interpretations of the objectives outlined in the Grade X curriculum guide for Geography.

1. To be able to explain the concept that it is the relationships between facts that are important in Geography.

2. To be able to outline on a map the parts of the world that are the most densely populated.

3. To be able to explain the serious defects of Mercator maps.

4. To be able to explain how the airplane has changed both time and space.

5. To be able to summarize in detail the present day importance of the polar regions.

6. To be able to explain how the air age has revolutionized the approach to map study.

7. To be able to state the ways in which air travel has affected Canada.

8. To be able to define weather and climate.

9. To be able to assess the relationship between climate, and the basic necessities of human life.

10. To be able to point out the ways in which man has succeeded in controlling unfavorable climatic conditions.

11. To be able to explain the effect of earth movements on climate.

12. To be able to list the four factors that are responsible for the changes of weather in the heat and light zones.

13. To be able to give examples of the ways in which climate may be studied indirectly through vegetation.

14. To be able to outline on a map the general world pattern of the vegetation belts.

15. To be able to compare and contrast the climatic-vegetative belts of the Northern and Southern Hemisphere.

16. To be able to distinguish between the terms latitude and longitude.

17. To be able to state some of the uses of latitude and longitude.

18. To be able to compare the difference between the northern and southern high latitudes.

19. To be able to point out why the high latitudes have suddenly come to have meaning for us.

20. To be able to describe the geographic conditions of the Arctic and Antarctic regions.

21. To be able to compare and contrast the geographic conditions of the Arctic and Antarctic regions.

22. To be able to describe the geographic conditions prevailing in the Arctic tundra.

23. To be able to name the peoples that live on the tundra.

24. To be able to describe how the peoples of the tundra live in their environment.

25. To be able to explain the relationships between the living conditions, soil, and economic assets of the taiga region.

26. To be able to assess the advantages the North Polar route has for travel by air.

27. To be able to explain the importance of the far North in weather forecasting.

28. To be able to give examples of how the intrusion of the white man in the Arctic has influenced the native peoples.

29. To be able to point out the influences, beside latitude, that are responsible for patterns of middle and low latitude vegetation.

30. To be able to identify the causes of high and low pressure areas on the earth's surface.

31. To be able to outline the location of the chief centres of high and low pressure on a map.

32. To be able to explain the differences in pressure belts in January and July.

33. To be able to explain the causes of wind.

34. To be able to point out the location of the world's wind belts on a map.

35. To be able to state the reasons for the direction in which the winds blow.

36. To be able to explain the relationship between the wind systems and the ocean currents.

37. To be able to outline the direction of the trade winds on a map.

38. To be able to explain the influence of the trade winds on climate.

39. To be able to recall the origin of the Westerlies.

40. To be able to list the causes of the great turmoil in the area where the Westerlies blow.

41. To be able to explain how the Westerlies affect the west coast and east coast of the continents.

42. To be able to list the differences between the upper and lower west coast climates.

43. To be able to write about the influence of the west coast marine climates in the areas where they are found on (i) vegetation, and (ii) people's energy and their economic activities.

44. To be able to identify the location of the Mediterranean type of climate on a map.

45. To be able to explain the nature and influence of the Mediterranean type of climate in the areas where it is found.

46. To be able to outline the extent and location of the main desert areas of the world on a map.

47. To be able to explain the different causes of dry areas in the world.

48. To be able to list the climatic and topographical similarities of the various desert areas of the world.

49. To be able to list the climatic and topographical differences of the various desert areas of the world.

50. To be able to explain how plant and animal life have adapted themselves for living in desert areas.

51. To be able to give examples of how oases and irrigation make certain desert areas habitable.

52. To be able to predict the future possibilities of the world's deserts.

53. To be able to outline the differences between lands that are sunny and dry, and those that are cloudy and moist.

54. To be able to outline the location and extent of the dry lands on a map.

55. To be able to show through the use of diagrams the amount of yearly rainfall that dry lands receive.

56. To be able to explain that high mountains have a climate that is different from the surrounding country.

57. To be able to define the meaning of "rain shadow".

58. To be able to state the cause of the desert regions in North and South America.

59. To be able to explain the effects of the north-east and south-west trade winds as makers of deserts.

60. To be able to state what makes a desert.

61. To be able to outline how desert areas may differ from one another.

62. To be able to distinguish between deserts in middle latitudes and deserts in tropical areas.

63. To be able to explain how the climate of the middle latitude deserts may vary.

64. To be able to state the reasons why plants can grow in deserts.

65. To be able to identify the kinds of animal life found in the North American deserts.

66. To be able to outline the importance and extent of irrigation in the North American desert.

67. To be able to create a vivid picture of the human, animal, and plant life of the Sahara Desert.

68. To be able to explain how life is lived around the oases of North Africa.

69. To be able to compare the main differences of the tropical deserts of Arabia, West Pakistan, the Kalahari, and the Atacama.

70. To be able to give examples of how and to what extent the deserts are being put to use.

71. To be able to outline the location and extent of the world's steppe lands on a map.

72. To be able to describe the vegetative nature of the steppe lands.

73. To be able to describe the climatic conditions that produce the steppe lands.

74. To be able to write a detailed analysis of the steppe lands of North America.

75. To be able to compare and contrast the steppes of the old world lands with respect to their effects on the social, economic, and cultural life of their peoples.

76. To be able to outline the present and future possibilities of the steppe lands of the northern hemisphere by studying charts, graphs, and diagrams.

77. To be able to assess the difficulties associated with productivity of some of the steppe lands.

78. To be able to explain how good conservation principles may be applied to save valuable lands for perpetual use.

79. To be able to describe the general weather conditions that characterize humid continental lands.

80. To be able to outline on a map the extent of humid continental lands.

81. To be able to describe the extent and types of vegetation that are found in humid continental lands.

82. To be able to assess the importance of these vegetative belts to mankind.

83. To be able to contrast the weather conditions of a dry tropical region with a wet tropical region.

84. To be able to summarize all the geographical factors relating to the cotton industry in the U.S.A.

85. To be able to explain how the cotton belt of the U.S.A. has been enriched by the addition of other agricultural industries.

86. To be able to name the crops of the wet lands of the U.S.A.

87. To be able to state the economic problems of the Old South.

88. To be able to show with graphs and charts how modern industrialization is raising the standards of living in the Old South by providing a better balance between agriculture and industry.

89. To be able to list the land products of the subtropical areas of South America.

90. To be able to list the food productions of other world areas having subtropical climates.

91. To be able to describe the problems concerned with living in subtropical areas in the Far East.

92. To be able to explain how improvements can be brought about in the subtropical areas of the Far East.

93. To be able to describe the vegetative nature of savanna country.

94. To be able to outline the location and extent of the savanna lands on a map.

95. To be able to distinguish between dry savanna lands and wet savanna lands.

96. To be able to relate dry savanna lands and wet savanna lands with their particular vegetation, animal life, and man's activities in them.

97. To be able to list the places where monsoon climates prevail.

98. To be able to outline the origin of monsoons and their significance to the peoples whom they affect.

99. To be able to outline the location of jungle lands and rain forests on a map.

100. To be able to summarize the difficulties, dangers, and discomforts of jungle life.

101. To be able to write a short story explaining the daily conditions that exist in the rain forests.

102. To be able to explain how the amount and character of relief and elevation of land affect the cultural environment of man.

103. To be able to outline the extent, the origin, and man's use of plateau lands.

104. To be able to explain the relationship of the Plains to man's cultural achievements.

105. To be able to describe the effect of the Plains on the destiny of man.

106. To be able to outline the value and distribution of the natural resources of forests, grasslands, and wild life.

107. To be able to explain how man has been using the world's renewable resources.

108. To be able to show the importance of good conservation practices and laws by constructing posters, charts, and graphs that depict the conservation advances made in developing the natural resources.

109. To be able to explain the concept that soils are of prime importance to man's existence.

110. To be able to summarize the origins of the various soil types in Canada and the United States.

111. To be able to explain how the various soil types of the United States and Canada are classified.

112. To be able to outline on a map the distribution of the various soil types throughout Canada and the United States.

113. To be able to explain the agencies and forces that are damaging the soils of our own environment, and North America in general.

114. To be able to list some of the ways and means of saving the soil and using it to the best advantage.

115. To be able to state what is meant by "mineral resources".

116. To be able to outline how the use of mineral resources has contributed to and reflects man's progress.

117. To be able to outline the extent that mineral resources are distributed among the nations of the world.

118. To be able to distinguish between the relative importance and various uses of mineral resources.

119. To be able to explain the origin of mineral fuels.

120. To be able to explain how mineral fuels are recovered and their significance to modern man.

121. To be able to outline the extent to which water power has been developed among the nations of the world.

122. To be able to estimate the future possibilities of water power.

123. To be able to justify the need for conserving the world's fuel, metal, and water resources.

124. To be able to list some of the practical measures relating to the proper use of these resources.

125. To be able to explain how the uneven distribution of mineral resources has sometimes led to friction and conflict among nations.

126. To be able to explain the stimulating and controlling factors and forces associated with world manufacture and trade.

127. To be able to identify the general principles governing manufacture and trade in Newfoundland.

128. To be able to give examples of how transportation and communication have a geographic basis.

129. To be able to list some of the primitive means of transportation that are still in use in our modern age.

130. To be able to outline the history, present status and importance of roads in the province of Newfoundland.

131. To be able to list the functions of roads.

132. To be able to list the reasons for the routes that roads follow.

133. To be able to explain the differences between railroads and trains as carriers of goods.

134. To be able to justify the place that rivers have held and their present use as a means of transportation.

135. To be able to give examples of how canals help in trade.

136. To be able to outline the geography of the great ocean trade routes.

137. To be able to explain the present use of the airplane as a means of transport.

138. To be able to predict the future use of the airplane as a means of transport.

139. To be able to outline the development of the importance of communications in carrying on trade.

140. To be able to estimate the importance of communications in carrying on trade.

141. To be able to explain the fact that the welfare of one nation affects the welfare of every other nation.

142. To be able to state what makes nationalism a fact.

143. To be able to list the ways a nation's behaviour is influenced by the ground in which it is rooted.

APPENDIX B - SECTION 3

The following are objective test items that have been asked on the Grade IX and X Public Examinations in Geography between 1960-69.

1. The chief occupation of Denmark is _____.
2. The world's busiest sea lanes lie across the _____ Ocean.
3. The vegetative area where lumbering is an important industry is called _____.
4. Time zones are determined by _____.
5. The greatest fish producing country in Europe is _____.
6. The most important grain producing region in England is _____.
7. Most of Finland's exports come from _____.
8. The _____ is a range of mountains separating France and Spain.
9. A _____ climate is one that has hot summers and cold winters.
10. The chief food crop of the people of Southeast Asia is _____.
11. _____ is a country in Europe that sells its farm products through a co-operative.
12. The largest island of the British Isles is _____.
13. The great land mass consisting of Europe and Asia is called _____.
14. _____ is a country to which Sweden exports much of its iron ore.
15. The _____ sea separates the British Isles from Europe.
16. Iraq's most important commercial product is _____.
17. A plant from which sugar is obtained is _____.

18. The most important grain crop grown in Russia is _____.

19. A country in Asia whose climate is most affected by ocean currents is _____.

20. The capital of Scotland is _____.

21. The _____ is a region in England famous for making china and earthenware.

22. The _____ River is the most important waterway in Europe.

23. More than a quarter of the country of _____ is below sea level.

24. An important coal mining area in Europe is located at _____.

25. The _____ is the longest river in Russia.

26. _____ is a term referring to a fringe of islands off the coast of Norway.

27. The chief commercial product of Iran is _____.

28. The long range of mountains separating Europe from Asia is the _____.

29. The _____ separates Asia from North America.

30. _____ is the British crown colony lying near the coast of China.

31. The wettest sector of Eurasia is the _____.

32. The capital of Spain is _____.

33. The area of the United Kingdom is _____ times as large as the area of France.

34. One of the most important minerals mined in Portugal is _____.

35. The transportation system on which Czechoslovakian trade depends more than any other is _____.

36. The most important crop harvested in Mediterranean lands is _____.

37. The chief food crop of China is _____.

38. _____ is a large ice-free port in the north of Russia.

39. The most important food crop of Japan is _____.

40. The best farmlands of Russia are found in the _____.

41. The other country, which with Spain is known as the Iberian Peninsula is _____.

42. _____ is a country in Eastern Europe which is noted for its fine glassware.

43. Edinburgh is the capital of _____.

44. The explanation of the symbols or the code used on maps is called the _____.

45. The highest mountain peak in the world is _____.

46. The nomads of Arabia are called _____.

47. The largest country of South-east Asia is _____.

48. The northern forest lands of Russia are called _____.

49. _____ is a European country that supplies one-third of the world's supply of cork.

50. The Japanese people belong to the _____ race.

51. The centre of the steel industry of England is the city of _____.

52. The capital of Iceland is _____.

53. The _____ are a group of Danish islands that lie about half-way between Scotland and Iceland.

54. The countries of Spain and Portugal make up the _____ Peninsula.

55. Early civilization emerged in the river valley of the _____ River.

56. The deep yellow soil of China is called _____.

57. The word _____ means seasonal.

58. _____ refers to the amount of water vapour in the air.

59. The term meridian refers to a line of _____.

60. The capital of Denmark is _____.

61. The _____ is a mountain range found in England.

62. The main business and commercial centre of Switzerland is _____.

63. The greatest port on the Rhine River is _____.

64. The most important industry of Northern Sweden is _____.

65. Great Britain is made up of three countries: England, Wales, and _____.

66. The numbered lines on temperature maps are called _____.

67. The capital of Italy is _____.

68. The most important oil field of Russia is located near _____.

69. Tel Aviv is the capital and largest city of _____.

70. Belgium, The Netherlands, and Luxembourg are often called the _____ Countries.

71. The largest city in Japan is _____.

72. The most important crop grown in France is _____.

73. The most northerly large town in the world is _____.

74. The outstanding industrial city of the English Midlands is _____.

75. The capital of Russia is _____.

76. The largest land mass in the world is _____.

77. A map that shows the land surface, buildings, roads, and other man-made structures is called a _____ map.

78. Norway, Sweden, and Denmark are usually called the _____ Countries.

79. The Iberian Peninsula is cut off from the rest of Europe by the _____ Mountains.

80. The largest islands near the west coast of Europe are the _____.

81. Places far from the sea experience a type of climate called _____.

82. The areas of cold marshy plain that are found in the northern parts of Eurasia are called _____.

83. Most of the iron ore of Sweden is shipped through the port of _____.

84. The modern name for Persia is _____.

85. The most important fishing centre on the coast of Norway is _____.

86. An Asian country whose climate is affected by ocean currents is _____.

87. _____ are flatlands reclaimed from the sea.

88. The most important passenger port in Britain is _____.

89. The centre of the cotton industry in England is _____.

90. The city that was and still is the "fashion centre of the world" is _____.

91. The most important waterway in Europe is the _____ River.

92. The leading manufacturing country of Asia is _____.

93. The country that did not exist in Europe before World War I is _____.

94. The capital of France is _____.

95. The most important tin plate mills in Wales are in _____.

96. The most prosperous of the Scandinavian countries is _____.

97. The most important country in Europe without a sea-coast is _____.

98. The capital of Iraq is _____.

99. The _____ Mountains separate Italy and Switzerland.

100. The Danube River flows into the _____ Sea.

101. The country of Asia which produces the most tea is _____.

102. The capital of Turkey is _____.

103. Wandering hunters and herdsmen are called _____.

104. _____ is a European country world famous for its vacation resorts.

105. The businessman's biggest problem in carrying on business in Eurasia is _____.

106. In a journey across Eurasia we find densely populated regions near _____.

107. The best way of showing the height of land surface is by using _____ maps.

108. Maps that aid farmers, sailors, and airlines are drawn by _____.

109. Dikson is an island in the _____ Ocean.

110. The world's greatest producer of copra is the country of _____.

111. The United Kingdom consists of _____.

112. The capital of Luxembourg is _____.

113. More than half the overseas visitors reaching Britain by sea use the port of _____.

114. Approximately 80% of Finland's exports come from its _____.

115. The most important occupation of France is _____.

116. The River Rhône flows into the _____ Sea.

117. The capital of Czechoslovakia is _____.

118. The earliest Western civilizations were established along the shores of the _____ Sea.

119. In Indonesia the chief food crop is _____.

120. _____ is often called the "land of the midnight sun".

121. _____ is a country that consists of 15 separate republics.

122. The capital of mainland China is _____.

123. The third largest country on earth in terms of area is _____.

124. _____ is the port of Tokyo.

125. _____ is often called the "land of the free".

126. The capital of the Ukraine is _____.

127. _____ is largely a man-made country.

128. The largest city of Israel is _____.

129. The waterway between Sweden and Finland is called _____.

130. The capital of England is _____.

131. The River Seine flows mainly through the country of _____.

132. The _____ Canal forms an important link between the Baltic Sea and the North Sea.

133. Cork and wine are the chief exports of the country of _____.

134. _____ is a city in the English Midlands famous for the manufacture of bicycles.

135. The best way of showing how people are distributed is by using _____.

136. Iraq's most important commercial crop is _____.

137. The capital of the Irish Republic is _____.

138. Most of the rivers of Russia flow into the _____ Sea.

139. The largest island in the Japanese group is _____.

140. The capital of Sweden is _____.

141. The most important industry in France is _____.

142. The Low Countries are Belgium, Luxembourg, and _____.

143. Countries in the heart of Europe have a kind of climate commonly called _____.

144. The leading manufacturing country of Asia is _____.

145. Most of Iceland's factories process _____.

146. The _____ River is often called "China's sorrow".

147. The central plateau area of Spain is called the _____.

148. _____ is an island halfway between Ireland and England.

149. The _____ are a mountain range in Wales.

150. The unforested plateau-like uplands of Norway are called _____.

151. Men who study and make weather maps are called _____.

152. _____ is the location of a great airport in Ireland.

153. _____ is a ship-building centre on the River Clyde.

154. The _____ Mountains separate the Black Sea and the Caspian Sea.

155. _____ is a republic of South-east Asia that is made up of more than a thousand islands.

156. _____ is a fuel that is widely used in Ireland.

157. A line drawn on a map so that all points on it are the same height above sea level is called a (an) _____.

158. London is located on the banks of the River _____.

159. The most important French seaport on the Mediterranean is _____.

160. One of the two advantages that has made the Ruhr a great industrial area is water transport; the other is _____.

161. The _____ is a range of mountains running through peninsular Italy.

162. _____ is the country that has the world's largest population.

163. The chief food crop of the Ukraine is _____.

164. The capital of Japan is _____.

165. The chief seaport of Northern Italy is _____.

166. The city of _____ is divided in two parts by the River Danube.

167. The earliest civilizations of the world developed in _____.

168. Poland's industrial wealth depends mainly on _____.

169. The total number of degrees of latitude between the North Pole and the Equator is _____.

170. The amount of food produced by Britain is _____% of its total needs.

171. The River ____ flows through the city of Paris.

172. _____ is probably the oldest existing religion.

173. The largest city of China is _____.

174. _____ is an important Russian seaport on the Pacific Ocean.

175. _____ is often referred to as the "land of the rising sun".

176. The _____ River flows into the Black Sea.

177. The largest ocean in the world is the _____ Ocean.

178. The movement of birds, animals, and fish from one region to another is called _____.

179. _____ is the continent that has the richest reservoir of oil.

180. A mass of violently whirling air that can do great damage over a limited area is called a (an) _____.

181. The richest nickel deposits on earth are mined at _____.

182. Thule, the most northerly air base in the world, is located at _____.

183. The poorest of all the lands with a west coast marine climate is _____.

184. The _____ Desert is an example of man's most brilliant victories over desert dryness.

185. _____ is the continent that is entirely covered by ice.

186. The science that deals with the stars, planets, and other heavenly bodies is known as _____.

187. _____ are lines used to indicate longitude.

188. _____ may be defined as a widespread, long-lasting and recurring condition of the atmosphere.

189. _____ are a series of cross lines used for the location of places on a map.

190. _____ is the lowest grade of coal.

191. The _____ is the name of a desert located in Chile, South America.

192. The chief food of over half the world's population is _____.

193. The _____ is a vegetable rich in protein and fat.

194. The shape of the earth is _____.

195. The most primitive occupation is _____.

196. The shortest distance between two places on the globe is a _____.

197. The local and temporary condition of the atmosphere is called _____.

198. Greenland is not an independent country; it is governed by the country of _____.

199. The Atacama Desert is located in the country of _____.

200. _____ is the country that has the largest area.

201. The Red River district in Manitoba is an example of a _____ plain.

202. The ocean highway in heaviest use today is the _____ Route.

203. The _____ Canal allows ships to pass between the Baltic and the North Sea.

204. Any map of the earth which shows sizes accurately is called a _____ map.

205. The lower few miles of the atmosphere where all our weather takes place is called the _____.

206. A map which pictures the earth as a cylinder and on which all lines are true and accurate compass directions is called a _____ map.

207. The number of degrees that the earth's axis is tilted away from the vertical position is _____.

208. The distance North or South of the Equator measured in degrees is called _____.

209. Egypt would be a desert if it were not for the river _____.

210. Brazil is the world's largest producer of _____.

211. On standard time when it is noon in St. John's, Newfoundland, the time in Toronto is _____.

212. A (an) _____ is an artificial mixture of two or more metals.

213. _____ is the site of an American Air Base very far north on the West coast of Greenland.

214. In the United States of America, cattle and hogs are raised most extensively in the _____.

215. The _____ projection is a map projection that is used for polar maps.

216. _____ is the site of an important uranium deposit in Canada.

217. _____ is an area in North America experiencing a Mediterranean type of climate.

218. The greatest interior waterway in the world is the _____ River.

219. A _____ is a type of vegetation in which trees are the most prominent element.

220. The _____ is an area in the United States famous for its rich deposits of iron ore.

221. The _____ are the strongest and sturdiest winds on the earth's surface.

222. The country of _____ is famous for its deposits of nitrates.

223. The _____ zone is the coldest climatic zone on earth.

224. One of the richest deposits of uranium ore is located in Canada near _____.

225. The monsoons are prevalent in the country of _____.

226. A typical tree of the west coast marine climate of North America is the _____.

227. _____ is a great cheese-producing state in the United States.

228. About two-thirds of the livestock in North America are raised in the _____ section of the United States.

229. A mineral in short supply in both Canada and the United States is _____.

230. A mineral used in removing iron from its ores is _____.

231. _____ is a long narrow country in South America.

232. The most important of all metals is _____.

233. The chief food of the people in most parts of Asia is _____.

234. An excellent food for fattening cattle in the United States is _____.

235. The world's leading producer of cotton is _____.

236. The only human occupation possible in the Atacama Desert is _____.

237. The exchange of surplus materials between countries is called _____.

238. The most important interior waterway in North America is the _____ River.

239. _____ is a metal used extensively in the construction of airplanes.

240. The Donetz coal fields are located in the country of _____.

241. The greatest producer of coffee is the country of _____.

242. _____ is a European country important mainly because of its position.

243. _____ is an important producer of rubber.

244. _____ is a Canadian city famous for its meat-packing industry.

245. _____ is a country whose population is approximately ten times that of Canada.

246. _____ supplies a large part of the world's nickel.

247. The country of _____ imports much of Argentina's vegetable and animal exports.

248. The earth's axis is inclined at an angle of _____ degrees.

249. The most important industry in the North America West Coast Marine climate is _____.

250. Citrus fruits grow mainly in an area with a _____ climate.

251. _____ is a mineral that has grown to major importance because of its use in atomic power.

252. The Mesabi iron ore mines are located in the country of _____.

253. The birthplace of modern manufacture was the country of _____.

254. The most significant invention in the whole history of land transportation was the _____.

255. The difference between magnetic north and true north is called _____.

256. The most primitive of all human occupations are hunting and _____.

257. The difference between the high and low level of the landscape is called _____.

258. In 1875 the telephone was invented by _____.

259. A representation of all or part of the surface of the earth is called a (an) _____.

260. The insect that does most harm to cotton is the _____.

261. The act or means of exchanging thoughts is known as _____.

262. A line on a map connecting points having the same average pressure at a given time is called a (an) _____.

263. A (an) _____ is a low place between the peaks of a mountain range.

264. _____ is wealth in money or property used in business.

265. The time when night and day are of equal length is called _____.

266. Determining ones location in relation to objects depicted on a map is called _____.

267. Seasonal winds of tropical regions are called _____.

268. The estimated number of stars in our universe is _____.

269. The smallest of the planets in order of relative size is _____.

270. The Zuider Zee is a part of the country of _____.

271. The Canadian city that has the lowest January temperature is _____.

272. The greatest depth of the ocean is nearest to _____ miles.

273. The number of tides in Southampton each day is _____.

274. The highest tidal bore in the world is encountered on the _____.

275. _____ is the language spoken by the greatest number of people.

276. _____ leads the world's countries in the yearly amount of steel production.

277. A (an) _____ is a fertile spot in the desert.

278. The starting point for measuring longitude is _____.

279. The time for a complete rotation of the earth is _____.

280. The height of Mount Everest is approximately _____ feet.

281. The Thar Desert is found in _____.

282. The climate enjoyed by Britain is typically _____.

283. Classification of the races of mankind is by _____.

284. Agriculture really means _____.

285. The country of _____ is the greatest producer of tea.

286. The pampas are found in the country of _____.

287. The _____ is a wind that brings an early thaw to the prairies.

288. _____ was the ore which man first learned to use.

289. _____ is the name given to hard bright coal.

290. _____ is a product from India that is used in the making of sacking.

291. The biggest ship-building country in the world is _____.

292. _____ is an instrument used to find the actual height above sea level.

293. The _____ is a warm water current in the Atlantic Ocean.

294. The _____ is an excellent example of a trade wind desert.

295. When it is June 21 in the northern hemisphere, the sun is directly over the _____.

296. The relationships between man and the earth are _____.

297. Ocean currents are caused chiefly by the _____.

298. Cold air can hold _____ moisture as/than warm air.

299. Winds occur only in the _____.

300. _____ is an iron-bearing rock of the Lake Superior District that can be up-graded and made useful.

301. The Imperial Valley in the U.S.A. is a good example of _____.

302. The West Coast Marine climate is characterized by _____.

303. The sea with the most salt is the _____.

304. The city of _____ is the greatest centre for automobile production.

305. The layer of soil found between the subsoil and the bedrock is called the _____.

306. The process of extracting metals from rocks by the use of fire is called _____.

307. Lines used for measuring distances in an east-west direction are called lines of _____.

308. The Gobi Desert is on the continent of _____.

309. Partially decayed organic matter such as dead leaves, twigs and roots is known as _____.

310. Air turning spirally around a centre of low atmospheric pressure is called a (an) _____.

311. _____ is the site of an important nickel mine in Canada.

312. A (an) _____ is any woven material.

313. Sandy lowlands of the Sahara Desert are called _____.

314. The _____ refers to the continents of Europe and the Americas.

315. Alternate planting of corn, grain, alfalfa to guard against soil erosion is called _____.

316. The _____ are a group of American Indians who make farming their main occupation.

317. The bed of a small stream in an arid country which is dry except after heavy rain is called a (an) _____.

318. The _____ are a group of people who live on the Kirghiz Steppe.

319. _____ are alluvial fans built up at the foot of a mountain.

320. The great grasslands of Argentina are called _____.

321. The rocky highlands of the Sahara Desert are called _____.

322. A line of steep cliffs between two adjoining plateaus that stand at different elevations is called _____.

323. _____ is an activity of man not considered very important in a mountain region.

324. Rain sinking into pores between particles of mantle-rock dissolves mineral materials and carries them away. This process is called _____.

325. _____ is the outstanding crop of monsoon regions where rainfall is the heaviest.

326. The world's largest producer of fish is _____.

327. The Atacama Desert contains one of the largest deposits of _____.

328. The location of a place with reference to the location of other places and the behaviour of people is called _____.

329. The wearing away of the land by wind and weather is called _____.

330. The belt of electrified air about 300 miles above the earth is called the _____.

331. Dust formed plains of China and central United States are called _____.

332. Between the tropical steppes and deserts and the equatorial forests lies the vegetation belt called _____.

333. The area serviced by a port is called its _____.

334. Large cattle ranches of Mexico are called _____.

335. The path which a smaller object in space takes in moving round a larger object is called its _____.

336. The large plateau in India is called the _____.

337. The _____ is a simple type of plant that grows on rocks and trees.

338. The land area drained by a river and its tributaries is called its _____.

339. A _____ is a horizontal ridge of earth on a plowed hill.

340. A _____ is a valley formed by a glacier and opening on the sea.

341. The _____ is the broad belt of evergreen forests south of the Arctic tundras.

342. _____ is the process through which water is changed to water vapour.

343. The dried "meat" of the coconut is called _____.

344. The largest city in Africa is _____.

345. The _____ desert is commonly known as the "great desert".

346. The Tropic of Cancer lies 32½ degrees north of the _____.

347. The zone between the Arctic Circle and the Tropic of Cancer is known as the _____.

348. Two of the 'big three' among the metals are iron, copper, and _____.

349. Hamilton Falls, one of the world's greatest potential sources of water power, has recently been renamed _____.

350. The outstanding advantages of the airplane as a means of transportation are directness and _____.

351. The Standard Time Meridian passes through England at a place called _____.

352. The means of moving men and goods from one place to another is called _____.

353. _____is a primitive form of human occupation.

354. _____ is a line on a map connecting points having the same average temperature at the same time.

355. The world's greatest producer of copper is the country of _____.

356. The parts into which the equator divides the world are called _____.

357. The processes through which raw materials are supplied for manufacture are called _____.

358. _____ is an African Colony rich in natural resources.

359. The most important east-west highway across Europe is the _____ River.

360. _____ is a fine example of an artificial harbour in North America.

361. The St. Lawrence Seaway provides a channel whose depth is not less than _____ feet.

362. The most valuable mineral deposit in the taiga regions is _____.

363. _____ is the mineral used extensively in the production of paper and rubber.

364. Los Angeles gets its water supply for domestic purposes from as far away as _____ miles.

365. The population of the island of Java is approximately _____ times that of Canada.

366. The largest of the Great Lakes in North America is _____.

367. The cleanest, hottest, and most valuable of all types of coal is _____.

368. The best known of the Arctic herders were the _____.

369. Agriculturally, Denmark is famous for its _____.

370. Large deposits of natural nitrates are found in the country of _____.

371. The world's leading exporter of meat is the country of _____.

372. _____ is a long narrow country in South America.

373. The city of _____ is the political heart of the Soviet Union.

374. _____ is a country located on a high plateau.

375. Fishing is the most important industry of the country of _____.

376. The country of _____ leads the world in the exporting of tin.

377. _____ is a country that has an area that is less than 1,000 sq. mi. in area.

APPENDIX B - SECTION 4

The following are questions that have been taken from the Grade IX and Grade X Geography Public Examinations administered between 1960-1969. All items have been tested once and in many cases more than once.

1. Explain the difference between isobar and isotherm.

2. Explain the difference between international date line and prime meridian.

3. Explain the difference between glacial plains and loess plains.

4. Explain the difference between stratosphere and ionosphere.

5. Explain the difference between wadi and artesian well.

6. Draw a neatly labelled diagram to illustrate why it is warmer near the equator than anywhere else on the earth's surface.

7. How do the pastoral nomads of the Kirghiz Steppe spend the summers?

8. How do the pastoral nomads of the Kirghiz Steppe spend the winters?

9. State three facts or conditions that influence the activities of people in the Corn Belt of the United States.

10. State two main differences between the farmer of Western lands and the farmer of Eastern lands.

11. Why do mountains get colder and wetter from their bases upward?

12. What are the chief advantages and disadvantages of commercial air transportation?

13. The exchange of surplus goods is known as trade. Give two reasons why so many countries exchange their surplus goods.

14. Name any four important elements which are the basis for national unity.

15. Give two reasons why such small countries as Switzerland, Belgium, Luxembourg, etc., are not absorbed by the large and powerful countries that surround them.

16. Name two countries that are small in area but have a large population.

17. Name two countries that are large in area but have a small population.

18. Explain the difference between tundra and taiga.

19. Explain the difference between physical environment and cultural environment.

20. Explain the difference between rain shadow desert and trade wind desert.

21. Explain the difference between thorn forest and jungle.

22. Explain the difference between nomadic people and sedentary people.

23. Draw a neatly labelled diagram to illustrate why it is warmer in summer than in winter.

24. Draw a neatly labelled diagram to illustrate the causes of the four seasons.

25. Draw a neatly labelled diagram to illustrate the contour lines of a hill.

26. Draw a neatly labelled diagram to illustrate a soil profile.

27. Explain and give examples of what is meant by the term "basic occupation".

28. List three ways by which the airplane has affected Canada.

29. Describe briefly the weather conditions experienced in a glacial climatic region.

30. Describe briefly the weather conditions experienced in a high latitude marine climatic region.

31. Describe briefly the weather conditions experienced in a west coast maritime climatic region.

32. Describe briefly the weather conditions experienced in a humid continental climatic region.

33. Describe briefly the weather conditions experienced in a humid subtropical climatic region.

34. Describe briefly the three types of land use that seem best suited to the Great Plains.

35. Describe the growing conditions of one of the following crops: wheat, cotton.

36. Describe Ellsworth Huntington's theory about the relationship between climate and human energy.

37. What are the three varieties of coal?

38. What are the uses of each variety?

39. Name two conditions necessary for the large scale manufacture of goods.

40. Name three conditions necessary for a good harbour to become a busy seaport.

41. The countries of the world can be divided into size on the basis of area. Arrange the following countries on that basis. (Largest first). Belgium, Great Britain, Canada, Luxembourg, Colombia.

42. Define (i) longitude (ii) latitude.

43. With the aid of a diagram briefly explain how latitude is measured.

44. Name the three kinds of rocks mentioned in your text-book.

45. In about half a page tell how any <u>one</u> of these types of rocks has been formed.

46. What are the chief forces at work in altering the relief of the land?

47. Show with the aid of a diagram or diagrams how any ONE of the forces that alter the relief of the land works.

48. With the help of diagrams and short explanatory notes show why some winds blow towards the equator and some towards the poles.

49. With the help of diagrams and short explanatory notes show why there are such frequent fogs on the Grand Banks.

50. With the help of diagrams and short explanatory notes show why the Great Shingle Desert exists in South America.

51. Copy the form below in your workbook and complete it for any three.

Type of Vegetation	Chief Characteristics	Country	Chief Industry
(a) Selvas			
(b) Savanna			
(c) Tundra			
(d) Continental Grassland			
(e) Mediterranean			

52. Give the conditions necessary for the large scale growth of THREE of the following, and name the chief producing country.

(a) Spring wheat
(b) Rice
(c) Tea
(d) Sugar
(e) Coffee

53. In about three quarters of a page write an account of any ONE of the great manufacturing industries of Britain.

54. Name FOUR ocean currents of the world.

55. Name FOUR regions where English is the commercial language.

56. Name FOUR great regions with a hot desert type of climate.

57. Explain the difference between weather and climate.

58. Explain the difference between troposphere and stratosphere.

59. Explain the difference between marine climate and continental climate.

60. Explain the difference between the scale and legend of a map.

61. What is a steppe?

62. The future of the Great Plains of North America depend on three things. What are they?

63. How does climate influence the strength of nations?

64. How may the shape of countries affect their national development?

65. Give an example of each of the following:

(a) a very large country.
(b) a large country.
(c) a medium sized country.
(d) a small country.
(e) a very small country.

66. Name two canals which shorten travel by sea.

67. When is a river said to be navigable?

68. Why is coastal trading declining as a method of transportation in Newfoundland?

69. Give four domestic uses of the airplane.

70. Describe the life of EITHER a Hopi Indian OR a Navajo Indian.

71. Explain how the Imperial Valley in Southern California has been changed from a desert into one of the richest farming regions in the world.

72. Either list or show by a diagram the seven pressure belts of the world.

73. How are winds produced?

74. What is meant by a West Coast Marine climate?

75. Name two countries in the Southern Hemisphere that have a West Coast Marine climate.

76. Conservation is the policy of using natural resources without destroying, wasting, or abusing them. What steps should be taken to conserve each of the following: (Mention two).

(a) Forests
(b) Game animals
(c) Fisheries
(d) Farmlands.

77. What climatic conditions best favour the growth of rice?

78. Maps are the best source of general information on geography. For what special purposes are the following maps used:

(i) outline maps
(ii) dot and circle maps
(iii) topographic maps

79. Explain the difference between winter wheat and spring wheat.

80. Explain the difference between rain forest and thorn forest.

81. Explain the difference between lignite coal and bituminus coal.

82. Explain the difference between alloys and ores.

83. Why is there a need to manufacture?

84. What are the three processes of manufacture and trade?

85. Give two benefits of decentralization of industry.

86. Give three reasons why maps are more practical than globes.

87. How does the simple cylindrical projector distort the true shape of the earth?

88. What is the chief difference between the simple cylindrical projection and the mercator projection?

89. What are the four main types of landscape?

90. How do the four main types of landscape differ from one another?

91. What are the four chief methods by which plowed land can be protected from erosion?

92. What are the three chief types of vegetation?

93. How are the main types of vegetation arranged on the surface of the earth?

94. Why has aluminum become so important a metal in the world today?

95. What country leads the world in the production of each of the following: iron; nickel; lead; tin.

96. State two ways in which the white man has benefited the natives of the tundra.

97. Name the three groups into which the tundra peoples are classified.

98. Draw a circle and sketch in the prevailing wind belts of the world.

99. Draw two diagrams, one showing the summer monsoon of India and the other the winter monsoon. Draw arrows showing the direction of wind, also indicate the high and low pressure belts.

100. Explain the difference between Mercator map and Lambert's conic conformal projection.

101. Describe the effect of a West Coast Marine climate on both vegetation and human energy.

102. Define the term desert.

103. What is the pattern of plant life on the desert?

104. In what respect is the Gobi Desert different from the Death Valley?

105. Briefly describe three ways the Imperial Valley of Southern California resembles the Nile Valley in Egypt.

106. What is the chief difference between a prairie and a steppe?

107. What four conditions are characteristic of all true steppes?

108. Compare the life of the Navajos with that of the Kazaks.

109. Locate the Corn Belt in North America.

110. Explain why the Corn Belt is so important.

111. Name four countries in Europe which might be classed as the Corn Belt of Europe.

112. Give two reasons why corn has not been developed in Europe as it has been in North America.

113. Name four climatic conditions necessary for the growth of cotton.

114. Write briefly on the boll weevil.

115. Give three reasons why cattle were not raised in the Cotton Belt of the United States until recently.

116. How were the difficulties of raising cattle in the Cotton Belt met in the Southern States?

117. In about a page write a detailed account on the cultivation, growth and importance of rice in the Orient.

118. How do the monsoons affect the native populations and Europeans living in these regions?

119. Explain what is meant by the Tennessee Valley Authority.

120. Name three benefits that have come to the inhabitants of the area as a result of the Tennessee Valley project.

121. Name and explain the three methods of conservation of farm soil.

122. Write a detailed account of coal showing the following:
(i) its origin
(ii) varieties
(iii) methods of mining
(iv) importance of industrial progress
(v) four countries which lead in production.

123. Write a detailed account of oil showing the following:
(i) its origin
(ii) discovery
(iii) method of discovery
(iv) its importance in the modern world
(v) six countries which lead in production.

124. Explain the difference between Prime Meridian and equator.

125. Explain the difference between cyclone and anticyclone.

126. Draw a neatly labelled diagram to illustrate contour lines of a hill 1000 feet high showing a gentle slope for the first 400 feet but quite steep from 600 feet to the top.

127. Draw a neatly labelled diagram to illustrate a simple conic map projection.

128. What influences are important in determining the world pattern of climatic regions?

129. On a trip from the North Pole to the Equator name the six belts of vegetation you would find and give them in the proper order.

130. Name three ways in which the presence of the white man in the Far North has harmed the natives of that region.

131. What climatic conditions are necessary for the growing of cotton?

132. Why did the southern United States develop a textile industry?

133. What are the chief problems of the farmers of the Winter Wheat Belt of the U.S.A.?

134. What are monsoons?

135. How are monsoons caused?

136. On the basis of rainfall, India can be divided into four climatic regions. Name these regions and describe the vegatation found in each.

137. What are the four major commercial fishing regions of the world?

138. What practices, carried on at present, could deplete the fish stocks in the four major commercial fishing regions of the world?

139. What steps have been take on an international level to remedy those practices that could deplete present fish stocks?

140. How is oil formed?

141. Illustrate by diagram a cross section of an oil well.

142. List two ways in which the world's supply of minerals can be conserved.

143. What is meant by manufacture?

144. Except as carriers of heavy and bulky loads over long distances the automobile has many advantages over trains. List three of these advantages.

145. Some nations of the world have very limited natural resources. Name three ways in which such a nation can adjust itself to this condition.

146. What is the International Date Line?

147. How does the International Date Line affect world travellers (a) going from west to east, and (b) going from east to west?

148. The countries of the world can be divided into three groups: (a) those having a large area and a large population, (b) those having a small area and a large population, and (c) those having a large area and a small population. To what group does each of the following countries belong: Canada, Russia, U.S.A., Japan and Australia.

149. Explain the difference between tundra and taiga.

150. Explain the difference between equinox and solstice.

151. Explain the difference between mathematical geography and physical geography.

152. Explain the difference between ice-built plains and glacial lake plains.

153. Draw a neatly labelled diagram to illustrate a rain shadow desert.

154. Draw a neatly labelled diagram to illustrate a simple conic map projection.

155. Define human geography.

156. List two ways in which the work of human geography is carried out.

157. Describe what the airplane has done to time distance and space distance.

158. Explain the difference in weather conditions in lands with a Continental climate and lands with a Mediterranean climate.

159. With the help of a diagram explain how a temperate cyclone forms.

160. Why does a temperate cyclone bring rain or snow to a wide area?

161. Describe some of the attempts that man has made to make a living in the taiga region.

162. How has the humid subtropical climate of the Southern U.S.A. made this region a land of great wealth?

163. Why are the tropical rain forests areas of low population?

164. Distinguish between light industries and heavy industries.

165. What is meant by the Fall Zone of the Atlantic Coastal Plain of the U.S.A.?

166. What three advantages do cities on this Fall Zone have?

167. What factors determine the location of ocean trade routes?

168. What is the difference between elevation and relief?

169. How do you distinguish between mountains, hills, and plateaus?

170. Write short explanatory notes on any SIX of the following: polders, moraine, sesamum, lac, nomads, heath, fault, tundra, moorland, fiords, Meseta, conservation, eskers.

171. From the given list of countries choose four that have a coastline.
Denmark, Switzerland, Czechoslovakia, Germany, Turkey, Pakistan, The Netherlands, Romania, Afghanistan, Italy, France, Luxembourg, and Hungary.

172. From the given list of countries choose four that have no coastline.
Denmark, Switzerland, Czechoslovakia, Germany, Turkey, Pakistan, The Netherlands, Romania, Afghanistan, Italy, France, Luxembourg, and Hungary.

173. From the given list of countries choose two that have colonies in other lands.
Denmark, Switzerland, Czechoslovakia, Germany, Turkey, Pakistan, The Netherlands, Romania, Afghanistan, Italy, France, Luxembourg, and Hungary.

174. Explain why seafoods are vitally important to Japan.

175. Explain why Canadian trees cannot grow on the shores of the Mediterranean Sea.

176. Name four important exports of Sweden.

177. Give two reasons why farming conditions are better in the southwestern part of Norway than elsewhere in the country.

178. Why has Norway few highroads and railroads?

179. Why is the Rhine Valley so densely populated?

180. Explain why hydro-electric power is more important to French industry than to German industry.

181. Give two geographical reasons explaining why Britain has become a great trading centre.

182. Give two geographical reasons explaining why the Rhine Valley has become a great industrial area.

183. Give two geographical reasons explaining why Amsterdam has become a great seaport.

184. Why is Manchuria a "cradle of conflict" for three nations?

185. Name three important rivers in China.

186. Give three reasons why Peking was chosen the capital of China.

187. Write briefly on one of the following:
(a) life in a Japanese fishing village;
(b) life on a Malayan rubber plantation;
(c) work of a Burmese lumberman in the teak industry.

188. Name two products of Indonesia.

189. Give three reasons for the backwardness of living conditions in the Danube lands.

190. Name the country in which six of the following cities is found: Sheffield, Bristol, Marseille, Katowice, Rangoon, Istanbul, Genoa, Osaka, Odessa.

191. Explain why the Swiss are successful watchmakers.

192. Explain why there are few farm animals in Japan.

193. Explain why the city of Copenhagen has grown so large.

194. Name three exports of France.

195. Name three imports of France.

196. France grows 90% of its own food. What makes it possible for France to be able to do this?

197. Some of Czechoslovakia's agricultural crops are grown for industrial purposes. What industrial use is made of each of the following? - potatoes, sugar beets, hops.

198. Name three fruits of Mediterranean lands.

199. Name three types of climate found in Eurasia.

200. Explain what kind of weather one would expect to find in each type of climate found in Eurasia.

201. Name three fruits of Mediterranean lands that are found in Eurasia.

202. Write a paragraph describing one of the types of vegetation found in Eurasia.

203. What is a problem in all the lands of Southwest Asia?

204. The lands of Southwest Asia are lands of rapid changes. Name one thing which has brought about striking changes in these lands.

205. What agricultural products of Iraq are similar to those of Turkey?

206. The Red Basin of Szechwan is one of the most fertile parts in China. Why is this basin so named?

207. Name three uses of seaweed in Japan.

208. Explain why Japan must "export or starve".

209. Explain the following terms: rotation of crops, mixed farming, humus, thermometer, steppe.

210. Choose any six of the following cities and state;
(i) in what country each is found.
(ii) name an important industry connected with each.

Bergen, Tokyo, Llanelly, Baku, Holmfors, Glasgow, Kiruna, Venice, Honshu.

211. Explain why England is warmer than Russia in winter.

212. Explain why the Ruhr Valley has become a great industrial region.

213. Explain why the Northern Plain of Italy has become a great farm region.

214. Explain why Switzerland has an important tourist trade.

215. Explain why farming is difficult in most Mediterranean lands.

216. State three geographical advantages of the British Isles.

217. What is meant by exports?

218. What is meant by imports?

219. Name two types of imports of the British Isles.

220. What three advantages are necessary for the location of a great seaport?

221. Name the country in which each of the following SIX seaports is found: Odessa, Narvik, Bristol, Antwerp, Hamburg, Marseille.

222. Name the three different types of climate found in France.

223. Name an important crop grown in each of the climatic areas of France.

224. What three different manufactures are carried on in the Paris area?

225. Give three reasons for Denmark's success in industry.

226. Name two ways in which the monsoons benefit China.

227. Explain three projects recently undertaken by the Chinese government to develop China.

228. What three chief raw materials are used in Japanese industry?

229. Name three countries to which Japan exports most of its manufactured products.

230. List three important items Japan receives in exchange for her manufactured products.

231. Define any SIX of the following terms: loess, icecap, cash crops, continental climate, fold mountains, glacial drift, great circle.

232. Explain why Japan is one of the leading nations in fishing.

233. Explain why Ireland is called the "Emerald Isle".

234. Explain why London cannot have skyscrapers like New York.

235. Explain why Western Britain is usually warmer than Eastern Britain in winter.

236. Give two reasons why many Canadian tourists visit Europe each year.

237. Give two reasons why the Arctic is very important today.

238. Give two reasons why the tundra is a difficult region in which to live.

239. Why are any four of the following places in the British Isles important: Glasgow, Sheffield, Grimsby, Liverpool, Coventry, Leeds.

240. The British Isles, though small in size, is the centre of one of the leading powers of the modern world. Account for this statement under the following headings: (i) location (ii) climate (iii) underground wealth, (iv) people.

241. Why, in recent years, has Poland become an importer rather than an exporter of grains?

242. Why is the Rhine River so important to the life of Germany?

243. Name the two races of Italians.

244. Describe the distinguishing characteristics of the two races of Italians.

245. State one interesting feature about: Mount Etna, Venice, Pisa, Turin.

246. Give two reasons why most of the rivers of Russia are not good means of transportation.

247. What are the main differences between farming in Russia and farming in Canada?

248. Why are the monsoons important to the life of China?

249. What steps has Japan taken to conserve her forests?

250. Why has Yokohama developed into a great port and industrial city?

251. Explain the following terms: monsoons, oasis, delta, irrigation, terrace, skerries, suomi.

252. Explain why the Hwang Ho is often called "China's Sorrow".

253. Explain why the olive tree grows well in Mediterranean lands.

254. Explain why the young people of Czechoslovakia are good athletes?

255. Explain why Stockholm and Venice are somewhat similar in their natural setting.

256. Give three reasons why a large seaport has been built at Southampton, England.

257. Name the two countries of Ireland.

258. Name the two activities that are helping to restore prosperity to the Scottish Highlands.

259. Name two ways in which the geographical features of Russia and Canada are alike.

260. Name two ways in which the geographical features of Russia and Canada are different.

261. Why is Murmansk in Northern Russia a great seaport?

262. Russia has a greater length of waterways than any other country in the world. Name two of its longest rivers.

263. Give two reasons why Czechoslovakia is one of the most advanced manufacturing countries in Europe.

264. Give two reasons why Spain is a difficult country to unify.

265. Name any two countries that make up South-east Asia.

266. What are some of the problems facing all the countries of South-east Asia?

267. The Chinese are determined to build a strong and modern nation. To do this they have many advantages. Name two of these advantages.

268. Rice is the chief food crop of Japan. What conditions favour the growth of this crop?

269. Name three cities of Japan.

270. The Danube River passes through or touches eight countries. Name any four of these countries.

271. The Danube Valley is divided into three parts by gates. One of these gates is located at Vienna. Name the other gate. Name the three parts into which the Valley is divided.

272. Iceland has no coal or oil. However it has two other sources of heat. What are they?

273. What are Finland's most important exports?

274. Belgium like Canada has two official languages. Name Belgium's two languages.

275. Explain the following terms: soil profile, taiga, contours, Prime Meridian.

276. Explain why the best means of transportation in Norway is provided by the sea.

277. Explain why many of the rivers in Russia flow in the wrong direction.

278. Explain why Dublin is the most important city in the Republic of Ireland.

279. Explain the difference between maritime climate and continental climate.

280. What conditions make East Anglia the most important grain growing area in Britain?

281. Why do Danish farmers sell their products through co-operatives?

282. To what extent is agriculture important in France?

283. Where does the Danube River begin and where does it end?

284. What are some of the obstacles to navigation on the Danube River?

285. How can the obstacles to navigation on the Danube River be overcome?

286. Why is the western part of Czechoslovakia one of the most important agricultural regions in Europe?

287. Name any two of the chief crops grown in the western part of Czechoslovakia.

288. How is the Highland region of Scotland like Norway?

289. How is Denmark unlike the other Scandinavian countries?

290. Why can Finland be described as a land of lakes and forests?

291. What are some of the changes that have taken place in South-west Asia in recent years?

292. Describe how the Bedouins of Arabia live.

293. Name two large cities of China.

294. Why is the Red Basin of Szechwan in China a great agricultural region?

295. Name four factors for large scale manufacturing in any country.

296. Name two of the factors of large scale manufacturing which are present in Japan.

297. Why are earthquakes common in Japan?

298. Explain the following terms: fens, topography, loess, isotherms, Bedouins, faults, crofts.

299. Explain why the standard of living in Sweden is one of the highest in the world.

300. Explain why London is the largest and most important city in Britain.

301. Describe the iron mining activities in Sweden.

302. Explain how the difficult conditions on the land have forced many Norwegians to make their living on the sea.

303. Give two reasons why Britain's share of world trade is less today than it used to be.

304. Give two reasons why Paris is the most important city of France.

305. Give two reasons for the low standard of living in Spain today.

306. In what ways do the climates of Eastern Europe and Western Europe differ?

307. Give three reasons why the lands of Eastern Europe are much more backward than the lands of Western Europe.

308. Give three ways in which Russia and Canada are similar.

309. What are two of the problems faced by Iran?

310. In what ways do ocean currents affect the climate of Japan?

311. Why are many of the Japanese manufactures small articles?

312. Why do the Hwang Ho River in China and most of the rivers of Japan carry heavy loads of silt?

313. Why can crops usually found only in hot lands be grown in the Red Basin of Szechwan?

314. How do the monsoon winds affect the climate of China?

315. The problems of Indonesia are similar to all other countries of South-east Asia. Name four of these problems.

316. Why are the river valleys of Eurasia the "cradles of civilization"?

317. From the two aeroplane journeys across Eurasia that were described in your text, give two observations that were made about the distribution of people there.

318. Coniferous forests, deciduous forests, and Mediterranean woodland are three types of vegetation. Describe any two of them.

319. Explain the following terms: the "Near East", environment, kaolin, rain guage, dykes.

320. Explain why Paris is the heart of France.

321. Explain why very little of the original vegetation of Mediterranean lands now remains.

322. Explain why Eurasia is considered the world's greatest melting pot.

323. Explain why countries of South-west Asia are called "countries of the crossroads".

324. Draw a diagram to illustrate the summer monsoon of South-east Asia.

325. Draw a diagram to illustrate the winter monsoon of South-east Asia.

326. Describe the climatic conditions of any two of the following types of climate; Mediterranean, continental, maritime.

327. Explain the difference between the British Isles and the United Kingdom.

328. Explain the difference between thermometer and barometer.

329. Explain the difference between deciduous and coniferous forest.

330. Explain the difference between mixed farming and scientific farming.

331. Explain the difference between fiords and skerries.

332. Name three of the natural resources that can make Spain and Portugal more prosperous than they presently are.

333. South-west Asia is often referred to as the "Lands of Rapid Changes". Name three changes that have come to South-west Asia in this present century.

334. Give four reasons for the prosperity of Israel.

335. Why are there so few people living in the central part of Asia?

336. Name three of the reasons why Russia has become a great industrial country.

337. Name three advantages that could enable China to become a very strong and modern nation.

338. Name two of the difficulties that China must face and overcome if it is to become a strong and modern nation.

339. State two ways in which the people of North China differ from the people of South China.

340. Explain any six of the following terms: great circle, heath, the potteries, skerries, the cockpit of Europe, a royalty, Bedouins, kolkhoz, permafrost.

341. Write a brief geographical account of Norway or Japan under the following headings: location, climate, vegetation, problems.

342. Give three problems common to all people of South-East Asia.

343. State three reasons why the British Isles are ideally located.

344. Give three reasons why France is almost self-supporting.

345. Why is Czechoslovakia one of Europe's most important countries.

346. State three similarities between Canada's Arctic Region and the Northern coastline of Russia.

347. Name the sea into which the Danube River flows.

348. State two ways in which the upper course of the Danube River differs from the lower course.

349. What is meant by the Benelux Countries, and the Scandinavian countries?

350. The motto of Zeeland is "I struggle to keep my head above water". Explain why this is so.

351. Why is Britain's trade less today than it was formerly?

352. What three nations have been interested in Manchuria and for what reasons?

353. What is meant by the Common Market?

354. State two ways in which the summer monsoon affects China?

355. The countries of Southwest Asia are said to be at the crossroads. Explain this statement.

356. Name four countries of Southwest Asia and give their capitals.

357. State three problems of Southwest Asia.

358. Why does the whole world need Southwest Asia?

APPENDIX C

Preliminary Questionnaire Submitted to the Three Judges

Bloom's six major categories of educational objectives: cognitive domain are represented by numbers that appear in the columns to the right of each statement that has been taken from the Grade VIII geography curriculum guide. Classify each statement according to one of the levels of Bloom's taxonomy.

Knowledge.....1	Analysis....4
Comprehension..2	Synthesis...5
Application....3	Evaluation..6

	1	2	3	4	5	6
1. To know the history of the peoples of the West Indies.						
2. To discover how living conditions on the islands of the West Indies are determined by the climate and vegetation of the area.						
3. To realize the contribution the people of the West Indies are making to the world's supply of food.						
4. To know the location, size, and early history of Mexico.						
5. To discover the wide variations in urban (particularly in Mexico City) and rural life in Mexico.						
6. To discover the changes taking place in Central America and the reasons for the same.						
7. To know the countries which make up Central America.						
8. To know the industries of the two natural regions of Central America.						
9. To understand latitude as "sun" lines and longitude as "time" lines.						

	1	2	3	4	5	6
10. To know the terms equator, hemisphere, isotate, degrees, and prime meridian.						
11. To know the location, size, and general topography of South America.						
12. To discover the problems which still exist in other parts of South America today.						
13. To know the reasons for the two types of mountain ranges, plateaus, and lowlands in South America - how the continent was built up.						
14. (Through the study of relief maps and diagrams) to discover the different kinds of climate experienced in South America, together with the reasons for the same.						
15. To discover why the various countries of South America are of such great importance to the Western Hemisphere, especially to the United States.						
16. To know the extent of the problems connected with the development of the resources of the countries of South America.						
17. To know the reasons for the vast differences in the living conditions throughout the country of Brazil.						
18. To know the work of the early explorers and discoverers of the Pacific.						
19. To know the main physical features of the country of New Zealand.						

	1	2	3	4	5	6
20. To discover the relationship between the physical features of New Zealand and the distribution of population.						
21. To see the relationship between the vegetation, industries, and climate of New Zealand.						
22. To discover how New Zealand is able to compete in Britain and other European countries even though she is so distant from these markets.						
23. To discover the industrial changes that are taking place on the continent of Africa as a result of development and settlement by Europeans.						
24. To discover the social changes that are taking place on the continent of Africa as a result of development and settlement by Europeans.						
25. To acquire a basic knowledge of the economic and social life of the various countries of Africa.						

APPENDIX D

Opinionnaire to Grade IX Geography Teachers

The following objectives have been taken from the Grade IX curriculum guide in Geography.

1. To establish that Europe and Asia do not have any sharply-defined divided line.

2. To understand that Canadians are people of different races and with many ancestral backgrounds.

3. To see where and how the main continents are connected to or are near one another and to see Eurasia as the Heartland of the World.

4. To note the chief islands that lie off the shores of Eurasia.

5. To get a general picture of what parts of Eurasia are most densely populated.

6. To understand that certain geographical conditions helped some peoples to progress and hindered others.

7. To appreciate that the similarities of peoples are greater than their differences in languages, race, and religions.

8. To get to know how weather conditions are recorded, mapped, and read.

9. To appreciate the regional differences that exist in Great Britain.

10. To know the importance of the Scottish Lowlands.

11. To understand the factors that have modified the trade of the British Isles.

12. To understand why France is almost self-supporting.

13. To understand the nature of the "Low Countries" and their location on the map.

14. To get an overall picture of the activities that are going on in the big importing and exporting cities and in all the manufacturing areas.

15. To understand how the Swiss people make a living and why they are so successful at it.

16. To appreciate the importance of the Rhine River as a great inland waterway.

17. To know how the tremendous output of industry is moved from the factories to the markets.

18. To know the economic differences between the main areas of Germany.

19. To know that there is a gradual change of conditions as one moves from Western to Eastern Europe.

20. To appreciate the type of people the Poles are.

21. To know the position, shape, and size of the country. Its main physical features and its importance as a manufacturing and trading nation.

22. To establish the great historical significance of the lands around the Mediterranean Sea.

23. To contrast their climate with that of Newfoundland and of Canada generally.

24. To know the specific geographical features of the Northern Plains of Italy.

25. To understand its main economic problems as a nation and how they could be lessened.

26. To appreciate the economic changes that are taking place in these lands.

27. To note the particular position of Turkey on a map.

28. To know the particular importance of Istanbul (Constantinople) and Izmir.

29. To understand that Iraq is the modern name for Mesopotamia but that modern Iraq includes more territory than the land between the rivers.

30. To understand the importance of the Euphrates and the Tigris Rivers in this area.

31. To compare and contrast the U.S.S.R. with Canada in all its principal geographical aspects.

32. To know the significant facts with reference to the great rivers in Russia.

33. To know the main facts concerning the peoples who make up the Soviet Union.

34. To understand the nature of Russia's new industries, their five year plans and the reasons for locating particular industries in certain areas.

35. To know the important facts about a representative number of cities in the U.S.S.R. and the reasons for the growth and increase of modern cities.

36. To understand and appreciate the chief geographical factors that determine the economic and social life of India and Pakistan.

37. To appreciate Great Britain's contribution to the progress of the sub-continent.

38. To know the chief foods grown and consumed in India and Pakistan and the chief crops grown for sale to other lands.

39. To understand to what extent India and Pakistan are industrialized.

40. To know what in general are the main economic concerns of the people in this area.

41. To see from map study the importance of south-east Asia in relation to sea and air routes to Japan and China.

42. To study the position and importance of Rangoon.

43. To understand how life is lived in the different regions of China.

44. To form an estimate of China's present and future possibilities as a great industrial nation.

45. To appreciate the great differences that exist in living conditions in Japan.

46. To appreciate the effect of ocean currents and winds on the Japanese climate.

47. To know the position of Japan with respect to power and metals.

48. To know the nature of Japanese manufactures and trade and its transportation system.

49. To know in particular Japan's trade relations with Canada.

The following are behavioural representations of the objectives outlined in the Grade IX curriculum guide for Geography.

1. Through careful study of a globe or a map of the world the student is able to establish that Europe and Asia do not have any sharply defined topographical dividing line.

2. Given a list of the different races of people to be found in Canada, the student must be able to relate them to the many ancestral backgrounds that prevail throughout Eurasia.

3. Through the careful study of maps the student is able to see where and how the main continents are connected to or are near one another.

4. Through the careful study of maps the student is able to discover that Eurasia is the 'Heartland of the World'.

5. To be able to list in order of geographical size the chief islands that lie off the shores of Eurasia.

6. Through the use of a population map of the world the student is able to obtain a general picture of what parts of Eurasia are most densely populated.

7. To be able to explain how certain geographical conditions helped some peoples to progress, while other peoples were hindered.

8. To be able to distinguish between the similarities and the differences that prevail among the peoples of Eurasia in terms of language, race, and religions.

9. To be able to state the ways in which weather conditions are recorded, mapped, and read.

10. To be able to give examples of the regional differences that exist in Great Britain.

11. To be able to justify the importance of the Scottish Lowlands.

12. To be able to list the factors that have modified the trade of the British Isles.

13. To be able to list the reasons why France is almost self-supporting.

14. To be able to locate the "Low Countries" on a map or a globe.

15. To be able to identify the activities that are going on in the big importing and exporting cities and in all of the manufacturing areas.

16. To be able to explain how the Swiss people make a living and why they are successful at it.

17. To be able to explain the importance of the Rhine River as a great inland waterway of Europe.

18. To be able to describe how the tremendous output of industry is moved from the factories to the markets.

19. To be able to outline the economic differences between the main areas of Germany.

20. To be able to list the differences that occur as one moves from Western to Eastern Europe.

21. To be able to describe what type of people the Poles are.

22. To be able to state the importance of Czechoslovakia as a manufacturing and trading nation.

23. To be able to point out the great historical significance of the lands around the Mediterranean Sea.

24. To be able to contrast the climate of Mediterranean lands with that of Newfoundland and of Canada generally.

25. To be able to list the specific geographical features of the Northern Plains of Italy.

26. To be able to list ways in which the economic problems of Italy could be lessened.

27. To be able to explain the economic changes that are taking place in the countries of South-west Asia.

28. To be able to locate the particular position of Turkey on a map.

29. To be able to describe the particular importance of Istanbul (Constantinople) and Izmir.

30. To be able to point out that Iraq is the modern name for Mesopotamia, but that modern Iraq includes more territory than the land between the rivers.

31. To be able to describe the importance of the Euphrates and Tigris Rivers in this area.

32. To be able to compare and contrast the U.S.S.R. with Canada in all its principal geographical aspects.

33. To be able to list the significant facts with reference to the great rivers in Russia.

34. To be able to state the main facts concerning the peoples who make up the Soviet Union.

35. To be able to explain the Russians five year plans and the reasons for locating particular industries in certain areas.

36. To be able to state the reasons for the growth and increase of modern cities in the Soviet Union.

37. To be able to identify the chief geographical factors that determine the economic and social life of India and Pakistan.

38. To be able to appraise Great Britain's contribution to the progress of the sub-continent.

39. To be able to list the chief foods grown and consumed in India and Pakistan.

40. To be able to summarize the extent to which India and Pakistan are industrialized.

41. To be able to describe in general the main economic concerns of the peoples in South-east Asia.

42. Through careful map study be able to explain the importance of South-east Asia in relation to sea and air routes to Japan and China.

43. To be able to describe the position and importance of Rangoon.

44. To be able to give examples of how life is lived in the different regions of China.

45. To be able to form an estimate of China's present and future possibilities as a great industrial nation.

46. To be able to explain the great differences that exist in the living conditions in Japan.

47. To be able to appraise the effect of ocean currents and winds on the Japanese climate.

48. To be able to outline Japan's position with respect to water power and metals.

49. To be able to state the nature of the Japanese transportation system.

50. To be able to describe in general Japan's trade relations with Canada.

Do the behavioral interpretations still represent the objectives as stated in the geography curriculum guide?

1. Yes ___ No ___
2. Yes ___ No ___
3. Yes ___ No ___
4. Yes ___ No ___
5. Yes ___ No ___
6. Yes ___ No ___
7. Yes ___ No ___
8. Yes ___ No ___
9. Yes ___ No ___
10. Yes ___ No ___
11. Yes ___ No ___
12. Yes ___ No ___
13. Yes ___ No ___
14. Yes ___ No ___
15. Yes ___ No ___
16. Yes ___ No ___
17. Yes ___ No ___
18. Yes ___ No ___
19. Yes ___ No ___
20. Yes ___ No ___
21. Yes ___ No ___
22. Yes ___ No ___
23. Yes ___ No ___
24. Yes ___ No ___
25. Yes ___ No ___
26. Yes ___ No ___
27. Yes ___ No ___
28. Yes ___ No ___
29. Yes ___ No ___
30. Yes ___ No ___
31. Yes ___ No ___
32. Yes ___ No ___
33. Yes ___ No ___
34. Yes ___ No ___
35. Yes ___ No ___
36. Yes ___ No ___
37. Yes ___ No ___
38. Yes ___ No ___
39. Yes ___ No ___
40. Yes ___ No ___
41. Yes ___ No ___
42. Yes ___ No ___
43. Yes ___ No ___
44. Yes ___ No ___
45. Yes ___ No ___
46. Yes ___ No ___
47. Yes ___ No ___
48. Yes ___ No ___
49. Yes ___ No ___
50. Yes ___ No ___

If your answer is No to any of the stated objectives, then state an alternative interpretation of the objective.

APPENDIX E

Questionnaire One Containing the Taxonomic Classifications of the Researcher and the Three Judges

Item	Judges			Researcher's Classification
	X	Y	Z	
1. What are the chief advantages and disadvantages of commercial air transportation?	1.00	1.00	1.00	1.00
2. Explain the difference between physical environment and cultural environment.	4.00	1.00	2.00	4.00
3. Draw a neatly labelled diagram to illustrate the contour lines of a hill.	2.00	1.00	1.00	4.00
4. Explain and give examples of what is meant by the term "basic occupation".	2.00	2.00	2.00	2.00
5. Name two countries in the Southern Hemisphere that have a West Coast Marine climate.	1.00	1.00	1.00	1.00
6. Draw a circle and sketch in the prevailing wind belts of the world.	3.00	3.00	1.00	3.00
7. Compare the life of the Navajos with that of the Kazaks.	6.00	2.00	2.00	6.00
8. Locate the Corn Belt in North America.	2.00	1.00	1.00	1.00
9. Give three reasons why cattle were not raised in the Cotton Belt of the United States until recently.	1.00	1.00	1.00	1.00
10. How were the difficulties of raising cattle in the Cotton Belt met in the Southern States?	2.00	1.00	1.00	2.00

Item	Judges			Researcher's Classification
	X	Y	Z	
11. Name three benefits that have come to the inhabitants of the area as a result of the Tennessee Valley Authority.	1.00	1.00	1.00	1.00
12. What influences are important in determining the world pattern of climatic regions?	1.00	1.00	1.00	1.00
13. How are monsoons caused?	2.00	2.00	2.00	2.00
14. Explain the difference between equinox and solstice.	4.00	4.00	2.00	4.00
15. Draw a neatly labelled diagram to illustrate a simple conic map projection.	2.00	3.00	1.00	4.00
16. What three advantages do cities on this Fall Zone have?	1.00	1.00	1.00	1.00
17. What factors determine the location of ocean trade routes?	1.00	1.00	1.00	1.00
18. Give two reasons why farming conditions are better in the southwestern part of Norway than elsewhere in the country.	1.00	1.00	1.00	1.00
19. Explain why hydro-electric power is more important to French industry than to German industry.	2.00	2.00	2.00	2.00
20. Name two products of Indonesia.	1.00	1.00	1.00	1.00
21. Explain why the Ruhr Valley has become a great industrial region.	2.00	2.00	2.00	2.00

Item	Judges			Researcher's Classification
	X	Y	Z	
22. Explain why farming is difficult in most Mediterranean lands.	2.00	2.00	2.00	2.00
23. Why is the Rhine River so important to the life of Germany?	2.00	2.00	2.00	2.00
24. Describe the distinguishing characteristics of the two races of Italians.	1.00	1.00	1.00	4.00
25. Why are monsoons important to the life of China?	2.00	2.00	2.00	2.00
26. Explain why Stockholm and Venice are somewhat similar in their natural setting.	2.00	2.00	2.00	2.00
27. Where does the Danube River begin and where does it end?	1.00	1.00	1.00	1.00
28. How can the obstacles to navigation on the Danube be overcome?	1.00	1.00	2.00	1.00
29. Describe how the Bedouins of Arabia live.	5.00	1.00	1.00	5.00
30. Explain the following terms: topography, fens, loess, isotherms, Bedouins, faults, crofts.	1.00	1.00	1.00	1.00
31. Why do the Hwang Ho River in China and most of the rivers in Japan carry heavy loads of silt?	2.00	1.00	2.00	2.00
32. Why are the river valleys of Eurasia the "cradles of civilization"?	2.00	2.00	2.00	2.00

Item	Judges			Researcher's Classification
	X	Y	Z	
33. Describe the climatic conditions of any two of the following types of climate: maritime, continental, Mediterranean.	2.00	1.00	1.00	5.00
34. The vegetative area where lumbering is an important industry is called the _____.	1.00	1.00	1.00	1.00
35. The greatest fish producing country in Europe is ____.	1.00	1.00	1.00	1.00
36. The capital of Scotland is _____.	1.00	1.00	1.00	1.00
37. More than a quarter of the country of _____ is below sea level.	1.00	1.00	1.00	1.00
38. _____ is a large ice-free port in the north of Russia	1.00	1.00	1.00	1.00
39. Edinburgh is the capital of _____.	1.00	1.00	1.00	1.00
40. The Japanese people belong to the _____ race.	1.00	1.00	1.00	1.00
41. Early civilization emerged in the river valley of the _____ River.	1.00	1.00	1.00	1.00
42. _____ refers to the amount of water vapour in the air.	1.00	1.00	1.00	1.00
43. The term meridian refers to a line of _____.	1.00	1.00	1.00	1.00
44. The modern name for Persia is _____.	1.00	1.00	1.00	1.00
45. The most prosperous of the Scandinavian countries is _____.	1.00	1.00	1.00	1.00

Item	Judges			Researcher's Classification
	X	Y	Z	
46. The businessman's biggest problem in carrying on business in Eurasia is ___.	1.00	1.00	1.00	1.00
47. The most important occupation of France is _____.	1.00	1.00	1.00	1.00
48. The third largest country on earth in terms of area is _____.	1.00	1.00	1.00	1.00
49. The capital of the Irish Republic is _____.	1.00	1.00	1.00	1.00
50. Countries in the heart of Europe have a kind of climate commonly called___.	1.00	1.00	1.00	1.00
51. The leading manufacturing country of Eurasia is ____.	1.00	1.00	1.00	1.00
52. _____ is the location of a great airport in Ireland.	1.00	1.00	1.00	1.00
53. The chief food crop of the Ukraine is _____.	1.00	1.00	1.00	1.00
54. The richest nickel deposits on earth are mined at ____.	1.00	1.00	1.00	1.00
55. The local and temporary condition of the atmosphere is called _____.	1.00	1.00	1.00	1.00
56. _____ is the country that has the largest area.	1.00	1.00	1.00	1.00
57. _____ is the site of an important uranium deposit in Canada.	1.00	1.00	1.00	1.00
58. The strongest and the sturdiest winds on the earth's surface are called the _____.	1.00	1.00	1.00	1.00

Item	Judges			Researcher's Classification
	X	Y	Z	
59. The ___ zone is the coldest climatic zone on earth.	1.00	1.00	1.00	1.00
60. The world's leading producer of cotton is _____.	1.00	1.00	1.00	1.00
61. The most primitive of all human occupations are hunting and _____.	1.00	1.00	1.00	1.00
62. The time when night and day are equal in length is called _____.	1.00	1.00	1.00	1.00
63. Southampton has _____ tides each day.	1.00	1.00	1.00	1.00
64. The Thar Desert is found in _____.	1.00	1.00	1.00	1.00
65. Classification of the races of mankind is by _____.	1.00	1.00	1.00	1.00
66. _____ is the biggest shipbuilding country in the world.	1.00	1.00	1.00	1.00
67. The _____ is a warm water current in the Atlantic Ocean.	1.00	1.00	1.00	1.00
68. _____ is the site of an important nickel mine in Canada.	1.00	1.00	1.00	1.00
69. The _____ are a group of American Indians who make farming their main occupation.	1.00	1.00	1.00	1.00
70. The _____ is a simple type of plant that grows on rocks and trees.	1.00	1.00	1.00	1.00

Item	Judges			Researcher's Classification
	X	Y	Z	
71. The most important east-west highway across Europe is the _____ River.	1.00	1.00	1.00	1.00
72. Given a list of the different races to be found in Canada, the student must be able to relate them to the many ancestral backgrounds that prevail throughout Eurasia.	4.00	4.00	4.00	4.00
73. Through the study of climatic graphs the student is able to explain the temperature and rainfall conditions of Eurasia.	2.00	4.00	2.00	2.00
74. To be able to outline the location of the "Low Countries" on a map or a globe.	2.00	1.00	2.00	2.00
75. Through the use of a map or a globe be able to identify the geographical position of Germany.	2.00	1.00	2.00	1.00
76. To be able to explain why Germany is classed as a leading industrial nation.	2.00	2.00	2.00	2.00
77. To be able to specify how the tremendous output of German industry is moved from the factories to the markets.	5.00	1.00	1.00	5.00
78. To be able to list the trade difficulties of present day Germany.	1.00	1.00	1.00	1.00
79. To be able to list the reasons explaining where the population of Turkey lives.	1.00	1.00	1.00	1.00

Item	Judges			Researcher's Classification
	X	Y	Z	
80. To be able to name the products that are grown on the land in Turkey.	1.00	1.00	1.00	1.00
81. To be able to compare and contrast the U.S.S.R. with Canada in all its principal geographical aspects.	6.00	4.00	2.00	2.00
82. To be able to explain how the U.S.S.R. is developing and utilizing her tundra region.	2.00	1.00	2.00	2.00
83. To be able to list the important facts about a representative number of cities in the U.S.S.R.	1.00	1.00	1.00	1.00
84. To be able to state the nature of the Japanese manufactures and trade.	1.00	1.00	1.00	1.00
85. To be able to state the ways in which air travel has affected Canada.	1.00	1.00	1.00	1.00
86. To be able to give examples of the ways in which climate may be studied indirectly through vegetation.	2.00	1.00	2.00	2.00
87. To be able to outline on a map the general world pattern of the vegetation belts.	2.00	1.00	2.00	2.00
88. To be able to distinguish between the terms latitude and longitude.	1.00	1.00	2.00	2.00
89. To be able to identify the causes of high and low pressure areas on the earth's surface.	4.00	1.00	1.00	1.00

Item	Judges			Researcher's Classification
	X	Y	Z	
90. To be able to explain the nature and influence of the Mediterranean type of climate in the areas where it is found.	2.00	2.00	2.00	2.00
91. To be able to outline the extent and location of the main desert areas of the world on a map.	2.00	1.00	2.00	2.00
92. To be able to explain how life is lived around the oases of North Africa.	2.00	1.00	1.00	2.00
93. To be able to give examples of how and to what extent the deserts are being put to use.	2.00	1.00	2.00	2.00
94. To be able to describe the climatic conditions that produce the steppe lands.	2.00	1.00	1.00	1.00
95. To be able to outline the present and future possibilities of the steppe lands of the northern hemisphere by studying charts, graphs, and diagrams.	4.00	5.00	2.00	3.00
96. To be able to outline on a map the extent of humid continental lands.	2.00	2.00	2.00	2.00
97. To be able to show with graphs and charts how modern industrialization is raising the standards of living in the Old South by providing a better balance between agriculture and industry.	3.00	2.00	3.00	3.00

Item	Judges			Researcher's Classification
	X	Y	Z	
98. To be able to outline the extent and location of the savanna lands on a map.	2.00	2.00	2.00	2.00
99. To be able to outline the origin of monsoons and their significance to the peoples whom they affect.	2.00	2.00	2.00	2.00
100. To be able to estimate the future possibilities of water power.	2.00	5.00	3.00	2.00
101. To be able to identify the general principles governing manufacture and trade in Newfoundland.	1.00	1.00	1.00	1.00
102. To be able to outline the history and present status and importance of roads in the province of Newfoundland.	2.00	2.00	2.00	2.00
103. Describe briefly the weather conditions experienced in a West Coast Maritime climatic region.	5.00	1.00	1.00	5.00
104. To be able to explain how Turkey's industries are being helped through Western aid.	2.00	1.00	1.00	2.00

APPENDIX F

Questionnaire Two Containing the Taxonomic Classifications of the Researcher and the Three Judges

Item	Judges			Researcher's Classification
	X	Y	Z	
1. State three facts or conditions that influence the activities of people in the Corn Belt of the United States.	1.00	1.00	1.00	1.00
2. Describe Ellsworth Huntington's theory about the relationship between climate and human energy.	2.00	2.00	2.00	2.00
3. What are the three varieties of coal?	1.00	1.00	1.00	1.00
4. Give four domestic uses of the airplane.	1.00	1.00	1.00	1.00
5. How are the main types of vegetation arranged on the surface of the earth?	2.00	2.00	2.00	2.00
6. Draw a circle and sketch in the prevailing wind belts of the world.	3.00	3.00	1.00	3.00
7. In a page write an account on the growth, cultivation and importance of rice in the Orient.	2.00	5.00	2.00	5.00
8. How do the monsoons affect the native populations and Europeans living in these regions?	2.00	2.00	2.00	2.00
9. Draw a neatly labelled diagram to illustrate contour lines of a hill 1,000 feet high showing a gentle slope for the first 400 feet, but quite steep from 600 feet to the top.	3.00	3.00	3.00	3.00
10. How is oil formed?	2.00	2.00	2.00	2.00
11. List two ways in which the world's supply of minerals can be conserved.	1.00	1.00	1.00	1.00

Item	Judges			Researcher's Classification
	X	Y	Z	
12. Draw a neatly labelled diagram to illustrate a simple conic map projection	3.00	3.00	1.00	3.00
13. Explain the difference in weather conditions in lands with a Mediterranean climate and lands with a Continental climate.	2.00	4.00	2.00	2.00
14. Give three reasons for the backwardness of living conditions in Danube lands.	1.00	1.00	1.00	1.00
15. Write a brief geographical account of Norway or Japan under the following headings: location, climate vegetation, and problems.	2.00	5.00	2.00	5.00
16. To be able to explain how the airplane has changed both time and space.	2.00	2.00	2.00	2.00
17. To be able to state some of the uses of latitude and longitude.	1.00	1.00	1.00	1.00
18. To be able to name the peoples that live on the tundra.	1.00	1.00	1.00	1.00
19. To be able to describe how the peoples of the tundra live in their environment.	2.00	2.00	2.00	2.00
20. To be able to assess the advantages the North Polar route has for travel by air.	2.00	2.00	4.00	6.00
21. To be able to point out the influences, beside latitude, that are responsible for patterns of middle and low latitude vegetation.	2.00	2.00	1.00	2.00

Item	Judges			Researcher's Classification
	X	Y	Z	
22. To be able to explain the differences in pressure belts in January and July.	2.00	4.00	2.00	2.00
23. To be able to list the climatic and topographical similarities of the various desert areas of the world.	1.00	1.00	1.00	1.00
24. To be able to show through the use of diagrams the amount of yearly rainfall that dry lands receive.	2.00	2.00	1.00	3.00
25. To be able to outline the importance and extent of irrigation in the North American desert.	2.00	2.00	2.00	2.00
26. To be able to compare the main differences of the tropical deserts of Arabia, West Pakistan, the Kalahari and the Atacama.	4.00	4.00	2.00	4.00
27. To be able to describe the vegetative nature of the steppe lands.	2.00	1.00	2.00	1.00
28. To be able to assess the difficulties associated with productivity of some of the steppe lands.	2.00	2.00	4.00	6.00
29. To be able to explain how good conservation principles may be applied to save valuable lands for perpetual use.	2.00	2.00	2.00	2.00
30. To be able to summarize all the geographical factors relating to the cotton industry in the U.S.A.	2.00	5.00	2.00	5.00

Item	Judges			Researcher's Classification
	X	Y	Z	
31. To be able to show with charts and graphs how industrialization is raising the standards of living in the Old South by providing a better balance between agriculture and industry.	3.00	2.00	2.00	3.00
32. To be able to relate dry savanna lands and wet savanna lands with their particular vegetation, animal life, and man's activities in them.	2.00	4.00	2.00	5.00
33. To be able to show the importance of good conservation practices and laws by constructing posters, charts, and graphs that depict the conservation advances made in developing man's natural resources.	3.00	3.00	2.00	3.00
34. To be able to list the ways a nation's behavior is influenced by the ground in which it is rooted.	1.00	1.00	1.00	1.00
35. Given a list of the different races to be found in Canada, the student must be able to relate them to the many ancestral backgrounds that prevail throughout Eurasia.	4.00	4.00	4.00	4.00
36. To be able to compare and contrast the size of Eurasia and its position on the globe, especially in relation to Canada.	4.00	4.00	2.00	4.00

Item	Judges			Researcher's Classification
	X	Y	Z	
37. Through the study of climate graphs the student is able to explain the temperature and rainfall conditions of Eurasia.	2.00	2.00	2.00	2.00
38. To be able to outline in a general manner what the land of France is like physically.	2.00	2.00	2.00	2.00
39. To be able to write an account of Poland with respect to present size, shape and position, its climate, landforms, its industries, and its cities.	2.00	5.00	2.00	2.00
40. Through the study of a physiographical map of Europe be able to construct a model of the kind of land where the Swiss live.	5.00	5.00	5.00	5.00
41. To be able to assess the importance of the Euphrates and Tigris Rivers to the peoples of south-west Asia.	6.00	6.00	4.00	6.00
42. To be able to point out that Iraq is the modern name for Mesopotamia, but that modern Iraq includes more territory than the land between the rivers.	1.00	1.00	2.00	4.00
43. To be able to tell the particulars of the U.S.S.R. with respect to the following: national resources, soils, oil, coal, forests, water power, iron ore, and other metals.	5.00	5.00	5.00	5.00

Item	Judges			Researcher's Classification
	X	Y	Z	
44. To be able to compare the relative importance of airways, waterways, and railways in the Soviet Union.	4.00	6.00	2.00	4.00
45. To be able to appraise the Soviet cultural advances during the past thirty years.	6.00	6.00	6.00	6.00
46. The nomads of Arabia are called _____.	1.00	1.00	1.00	1.00
47. The term meridian refers to a line of _____.	1.00	1.00	1.00	1.00
48. In Indonesia the chief food crop is _____.	1.00	1.00	1.00	1.00
49. _____ is largely a man-made country.	1.00	1.00	1.00	1.00
50. Most of Iceland's factories process _____.	1.00	1.00	1.00	1.00

APPENDIX G

Questionnaire Three Containing the Taxonomic Classifications of the Researcher and Judge Z in order to Establish Inter-Rater Reliability

Item	Judge Z	Researcher's Classification
1. The chief occupation of Denmark is _____.	1.00	1.00
2. Time Zones are determined by _____.	1.00	1.00
3. The _____ is a range of mountains separating France and Spain.	1.00	1.00
4. The largest island of the British Isles is _____.	1.00	1.00
5. The _____ Sea separates the British Isles from Europe.	1.00	1.00
6. The most important grain crop grown in Russia is _____.	1.00	1.00
7. The _____ is a region in England famous for its china and earthenware.	1.00	1.00
8. The _____ is the longest river in Russia.	1.00	1.00
9. The _____ separates Asia from North America.	1.00	1.00
10. The capital of Spain is _____.	1.00	1.00
11. The transportation system on which Czechoslovakian trade depends more than any other is _____.	1.00	1.00
12. The most important food crop of Japan is _____.	1.00	1.00
13. _____ is a country in Eastern Europe which is noted for its fine glassware.	1.00	1.00
14. The northern forest lands of Russia are called _____.	1.00	1.00
15. The capital of Iceland is _____.	1.00	1.00
16. The capital of Denmark is _____.	1.00	1.00

Item	Judge Z	Researcher's Classification
17. The greatest port on the Rhine River is _____.	1.00	1.00
18. The capital of Italy is _____.	1.00	1.00
19. Belgium, Luxembourg, and The Netherlands are often called the _____ Countries.	1.00	1.00
20. The most northerly large town in the world is _____.	1.00	1.00
21. Explain the difference between international date line and prime meridian.	2.00	2.00
22. How do the pastoral nomads of the Kirghiz Steppe spend their winters?	1.00	2.00
23. State three facts or conditions that influence the activities of people in the Corn Belt of the U.S.A.	1.00	1.00
24. The exchange of surplus goods is known as trade. Give two reasons why so many countries exchange their surplus goods.	1.00	1.00
25. Name two countries that are small in area but have a large population.	1.00	1.00
26. Draw a neatly labelled diagram to illustrate the causes of the four seasons.	3.00	3.00
27. Describe briefly the weather conditions experienced in a high latitude marine climatic region.	1.00	2.00
28. What are the three varieties of coal?	1.00	1.00
29. What are the chief forces at work in altering the relief of the land?	1.00	1.00

Item	Judge Z	Researcher's Classification
30. With the help of diagrams and short explanatory notes show why there are such frequent fogs on the Grand Banks.	2.00	3.00
31. Name four regions where English is the commercial language.	1.00	1.00
32. The future of the Great Plains of North America depend on three things. What are they?	1.00	1.00
33. How does climate influence the strength of nations?	2.00	2.00
34. Give four domestic uses of the airplane.	1.00	1.00
35. Explain the difference between rain forest and thorn forest.	2.00	2.00
36. Give two benefits of decentralization of industry.	1.00	1.00
37. What are the three chief types of vegetation?	1.00	1.00
38. Draw a circle and sketch in the prevailing wind belts of the world.	3.00	3.00
39. Draw two diagrams, one showing the summer monsoon of India and the other the winter monsoon. Draw arrows showing the direction of wind, also indicate the high and low pressure belts.	3.00	3.00
40. What is the chief difference between a prairie and a steppe?	1.00	1.00
41. Draw a neatly labelled diagram to illustrate the contour lines of a hill 1000 feet high showing the first 400 feet with a gentle slope but quite steep from 600 feet to the top.	3.00	3.00

Item	Judge Z	Researcher's Classification
42. Name three ways in which the presence of the white man in the Far North has harmed the natives of that region.	1.00	1.00
43. How are monsoons caused?	2.00	2.00
44. What are the four major commercial fishing regions of the world?	1.00	1.00
45. What is the International Date Line?	1.00	1.00
46. Define human geography.	1.00	1.00
47. Explain the difference in weather conditions in lands with a Continental climate and lands with a Mediterranean climate.	4.00	4.00
48. Why are the tropical rain forests areas of low population?	2.00	2.00
49. What is meant by the Fall Zone of the U.S.A., which is located along the Atlantic Coastal Plain.	1.00	1.00
50. Write short explanatory notes on any six of the following: polders, moraine, sesamum, moorland, lac, fault, nomads, Meseta, tundra, fiords, eskers.	1.00	1.00
51. Name four important exports of Sweden.	1.00	1.00
52. Why has Norway few highroads and railroads?	1.00	2.00
53. Give three reasons why Peking was chosen as the capital of China.	1.00	1.00
54. The lands of Southwest Asia are lands of rapid changes. Name one thing which has brought about striking changes in these lands.	1.00	1.00

Item	Judge Z	Researcher's Classification
55. Explain why the Ruhr Valley has become a great industrial area.	2.00	2.00
56. What is meant by exports?	1.00	1.00
57. Name two ways in which the monsoons benefit China.	1.00	1.00
58. Define any SIX of the following terms: loess, cash crops, icecap, continental climate, glacial drift, fold mountains, great circles.	1.00	1.00
59. Explain why London cannot have sky-scrapers like New York.	2.00	2.00
60. Give two reasons why the tundra is a difficult region in which to live.	1.00	1.00
61. The British Isles, though small in size, is the centre of one of the leading powers of the modern world. Account for this statement under the following headings: (i) location, (ii) climate, (iii) underground wealth, (iv) people.	5.00	5.00
62. Give two reasons why most of the rivers of Russia are not good means of transportation.	1.00	1.00
63. Explain the following terms: mon-soons, oasis, delta, irrigation, terrace, skerries, suomi.	1.00	1.00
64. Name the two countries of Ireland.	1.00	1.00
65. What are some of the problems facing all the countries of South-East Asia?	1.00	1.00
66. Explain the following terms: soil profile, taiga, contours, Prime Meridian.	1.00	1.00
67. Explain why the rivers of Russia flow in the wrong direction.	2.00	2.00

Item	Judge Z	Researcher's Classification
68. Explain the difference between maritime climate and continental climate.	2.00	2.00
69. Explain why Paris is the heart of France.	2.00	2.00
70. To be able to outline on a map the parts of the world that are the most densely populated.	3.00	2.00
71. To be able to explain how the airplane has changed both time and space.	2.00	2.00
72. To be able to point out the ways in which man has succeeded in controlling unfavourable climatic conditions.	2.00	1.00
73. To be able to give examples of the ways in which climate may be studied indirectly through vegetation.	4.00	2.00
74. To be able to compare and contrast the climatic-vegetative belts of the Northern and Southern Hemisphere.	6.00	4.00
75. To be able to point out why the high latitudes have suddenly come to have meaning to us.	2.00	2.00
76. To be able to describe the geographic conditions of the Arctic tundra.	1.00	2.00
77. To be able to explain the relationships between the living conditions, soil, and economic assets of the taiga region.	5.00	2.00
78. To be able to assess the advantages the North Polar route has for travel by air.	6.00	6.00

Item	Judge Z	Researcher's Classification
79. To be able to point out the influences, beside latitude, that are responsible for patterns of middle and low latitude vegetation.	4.00	4.00
80. To be able to outline the location of the chief centres of high and low pressure on a map.	2.00	2.00
81. To be able to explain the differences in pressure belts in January and July.	2.00	2.00
82. To be able to explain the causes of wind.	2.00	2.00
83. To be able to state the reasons for the direction in which the winds blow.	1.00	1.00
84. To be able to explain how plant and animal life have adapted themselves for living in desert areas.	2.00	2.00
85. To be able to give examples of how oases and irrigation make certain desert areas habitable.	1.00	2.00
86. To be able to outline the location and extent of the dry lands on a map.	2.00	2.00
87. To be able to explain that high mountains have a climate that is different from the surrounding country.	2.00	2.00
88. To be able to identify the kinds of animal life found in the North American deserts.	1.00	1.00
89. To be able to outline the present and future possibilities of the steppe lands of the northern hemisphere by studying charts, graphs, and diagrams.	4.00	4.00

Item	Judge Z	Researcher's Classification
90. To be able to name the crops of the wet lands of the U.S.A.	1.00	1.00
91. To be able to show with charts and graphs how modern industrialization is raising the standards of living in the Old South by providing a better balance between agriculture and industry.	2.00	3.00
92. To be able to list the food productions of world areas having subtropical climates.	1.00	1.00
93. To be able to describe the vegetative nature of savanna country.	1.00	1.00
94. To be able to show the importance of good conservation practices and laws by constructing posters, charts, and graphs that depict the conservation advances made in developing the natural resources.	3.00	3.00
95. To be able to list some of the practical measures relating to the proper use of these resources.	1.00	1.00
96. Through the study of both relief and vegetative maps of Eurasia be able to compare and contrast what the land surface of Eurasia looks like in crossing the double continent first from west to east and then from south to north.	6.00	4.00
97. To be able to describe the main vegetation and soil areas of Eurasia.	1.00	1.00
98. To be able to list the chief points of interest about London.	1.00	1.00
99. To be able to summarize in detail the particulars of the manufacturing industries and trade in France.	5.00	5.00

Item	Judge Z	Researcher's Classification
100. To be able to define what the French Union means.	1.00	1.00
101. Through the study of a physiographical map of Europe be able to construct a model of the kind of land where the Swiss live.	5.00	5.00
102. To be able to outline the economic differences between the main areas of Germany.	4.00	1.00
103. To be able to appraise the importance of the Danube River to European trade and commerce.	6.00	6.00
104. To be able to appraise the progress made by Italian industry, even though the basic raw materials must be imported.	6.00	6.00
105. To be able to describe in detail the conditions of farm life in India, the farmer's problems, and how assistance is being provided to help solve them.	5.00	5.00
106. To be able to appraise the effect of ocean currents and winds on the Japanese climate.	2.00	6.00