

Behaviour and Attitudes of Morgan Arboretum Users

ABSTRACT

Jack Inhaber

Department of Woodlot Management
Macdonald College of McGill University

BEHAVIOUR AND ATTITUDES OF SUBURBAN FOREST RECREATIONISTS IN THE MORGAN ARBORETUM, QUEBEC

This study was conducted in the Morgan Arboretum, a private suburban recreational forest. It examines the behaviour and attitudes of recreationists toward forest environments in general and Morgan Arboretum in particular.

There were no significant differences in either attitudes or behaviour between members and non-member users of the Arboretum. There was a positive correlation between group size and time spent during most of the year. In winter, however, the relation was negative. Walking was the main activity of Morgan Arboretum users. The Arboretum was used as a haven for temporary solitude not generally found in other urban or suburban areas. Users claimed to appreciate an untouched environment and yet the Arboretum was regularly harvested. As aesthetic quality increased the size of groups increased but the number of recreation hours did not. There was no relation between aesthetic appreciation and recreation hours. The Arboretum was thought to be nicest in fall but yet 42% of recreation hours occurred in spring.

ABREGE

Jack Inhaber

Department of Woodlot Management
Macdonald College of McGill University

COMPORTEMENT ET ATTITUDES DES USAGERS DE LA FOREST DE BANLIEUE DANS L'ARBORETUM MORGAN, QUEBEC

Cette étude a été conduite dans l'Arboretum Morgan, une forêt privée de la banlieue, utilisée à des fins de récréation. On y examine l'attitude des usagers et leurs réactions vis-à-vis de l'environnement forestier en général et de l'Arboretum Morgan en particulier.

Il n'y a pas eu de différences significatives dans l'attitude ou les réactions des membres de l'Arboretum et des non-membres. On a constaté une corrélation positive entre l'importance des groupes et la durée de leur séjour pendant la plus grande partie de l'année. En hiver, cependant, il y a eu corrélation négative. La marche a constitué l'activité principale des usagers. On a utilisé l'Arboretum Morgan comme un havre de solitude temporaire, tel qu'on ne peut plus généralement en trouver dans d'autres lieux similaires, urbains ou de banlieue. Les usagers ont exprimé leur appréciation pour un environnement naturel non encore touché par la main de l'homme bien que l'Arboretum ait été "exploité" régulièrement.

A mesure que les qualités esthétiques augmentaient, l'importance des groupes augmentait également, mais non le nombre d'heures de récréation. Il n'y a eu aucun rapport entre l'appréciation esthétique et les heures de récréation. On a trouvé que l'Arboretum était dans toute sa beauté en automne, mais cependant 42% des heures de récréation y ont été passées au printemps.

BEHAVIOUR AND ATTITUDES
OF
SUBURBAN FOREST RECREATIONISTS
IN THE
MORGAN ARBORETUM, QUEBEC

By
Jack Inhaber

A thesis submitted to the Faculty of Graduate Studies
and Research of McGill University, in partial fulfillment
of the requirements for a Master of Science Degree

c/o Department of Woodlot Management
Macdonald College of McGill University
Montreal, Quebec

June 1972

ACKNOWLEDGEMENTS

My most sincere gratitude goes to my advisor Dr. J. R. Bider, for the time, effort and knowledge which he so willingly gave me in order to make this study an enjoyable and meaningful experience.

I would like to thank Professor J. D. MacArthur, curator of The Morgan Arboretum, who permitted me to use the Arboretum for the collection of data and who made valuable suggestions in the preparation of this paper.

My appreciation to Mr. R. J. Watson, foreman of The Morgan Arboretum, who gathered important data while performing his regular duties. Much appreciation is extended to Mr. W. MacLean, who helped to gather valuable data.

A special thanks to my children, David and Neil, who were with me during many of the weekends at the Arboretum. A warm and sincere thanks to my wife, Rosalind, who spent many hours helping me organize and proofread this manuscript. Her encouragement was invaluable.

Thanks to Miss Mary Forcillo who spent a great deal of her time typing this manuscript.

Grateful acknowledgement goes to the parity committee of The Protestant School Board of Greater Montreal and the Montreal Teachers Association who granted me a sabbatical leave of absence so that I could conduct this study.

TABLE OF CONTENTS

	<u>PAGE</u>
<u>ACKNOWLEDGEMENTS</u>	iv
1. <u>INTRODUCTION</u>	
Review of Literature	4
2. <u>HISTORY OF MORGAN ARBORETUM</u>	
Geographical Location	8
The Early Years	8
- Early History	8
- From 1945 to 1952	10
- From 1953 to the Present	13
Membership Today	14
3. <u>BEHAVIOURAL PATTERNS</u>	
Research Methods and Analysis	17
- Control Group	18
Socio-Economic Make-up of Arboretum Users	18
- Education	18
- Annual Income	19
- Occupations	20
- Place of Residence and Distance Travelled	21
Users Activity Parameter in Morgan Arboretum	23
Group Make-up, Time Factor and Recreation Hours	25
Activities	28
Activities as Related to Areas	32

	<u>PAGE</u>
4. <u>ATTITUDES OF ARBORETUM USERS</u>	
Method	36
- Distribution of User's Attitude Questionnaire	37
Results of Factors	38
- Factor 1 - Obligations and/or Duty	38
- Factor 2 - Behavioural Controls	40
- Factor 3 - Purist Symbols	42
- Factor 4 - Reaction Toward Other Users	44
- Factor 5 - Improvement	46
Summary of Attitudes	48
5. <u>USER'S ATTITUDE TOWARD ANY FORESTED ENVIRONMENT</u>	51
Pattern of Responses to an Outdoor Environment	53
- Group 1 - Rustification	53
- Group 2 - Naturalism	54
- Group 3 - Physical Vigour	56
- Group 4 - Awareness of Beauty	56
- Group 5 - Enjoyment of Unspoiled Nature	58
- Group 6 - Miscellaneous	59
- Group 7 - Social Interaction	60
- Group 8 - The Products of Human Workmanship	61
- Group 9 - Modesty	62
Summary	62
User's Reaction to Accepted Government Recreational Laws	66

	<u>PAGE</u>
6. <u>CONCLUSIONS</u>	
Summary of Specific Findings	69
Recommendations	76
7. <u>FIGURES</u>	79
8. <u>APPENDIX</u>	111
9. <u>LITERATURE CITED</u>	135
10. <u>ADDITIONAL BIBLIOGRAPHY</u>	138

INTRODUCTION

This study, conducted in the Morgan Arboretum, is concerned with the use of forest land for recreation. There has been very little coordinated research into the relationship between behaviour and attitudes of recreationists toward a forested environment. There has been no research related to a suburban forest. This study investigates behaviour of recreationists in Morgan Arboretum, a suburban forest. It also examines attitudes of recreationists toward any forested environment and toward Morgan Arboretum in particular.

The need for such research has been stimulated by the fact that attendance at Canadian National Parks has been growing rapidly since the end of World War II. From 1945 to 1965 the number of visits increased twenty-five fold (Taylor, 1967). There is no indication that this upward trend will change in the foreseeable future (Fig. 1).

It is possible that improved means of transportation and better roads, combined with more leisure time, have stimulated more recreational activity. In 1960 the average work week was thirty-nine hours, and by the year 2000 it is anticipated that the average work week will be 32 hours. (Stewart, 1963). In 1960 the average vacation time was two weeks, and by the year 2000 it is believed the average vacation time will be four weeks (Stewart, 1963).

A good part of this recreation seems directed toward the forests. Already the impact of the recent increases in forest recreation are causing concern among forest managers. It has been stated (Anon., 1962) that no conflict over land use is growing faster than the one between the people who desire outdoor forest recreation and those who desire economic benefits from the forests.

Although an analysis of these supposedly competitive entities, forest recreation and timber management, is not the purpose of this study, a brief discussion of the subject is nevertheless important. Bowen (1963) defines timber management as "proper management of forest through application of both sound business methods and forest principles with the ultimate goal of producing a continuous supply of timber and timber products." Stewart (1963) defines forest recreation as "any pleasurable activity that depends upon or that derives its sense of pleasure from a forest atmosphere". To many recreationists and production foresters, production and recreation are not compatible (Heath, 1964). To some enlightened forest managers and wilderness recreationists the two situations can be complementary. In order for the two situations to be compatible Gould (1961) claims that forest managers must continually be reappraising their plans and objectives if they are to meet the challenge of educating the

recreationist to the concept of the multiple use of land.

The "park" forester realizes that as the number of visitors increase two things usually happen to the forest environment, misuse (such as garbage accumulation, carvings on trees, destruction of saplings, digging of holes, etc.) and overuse (such as human erosion, compaction of soil, trampling, etc.). Both lead to the deterioration of both the aesthetics and the biological production of the forest. The professional forester has two choices in order to prevent rapid deterioration -- either keep people out of the forest or allow people to enter the forest while advocating care and careful management. Since recreational desires and needs vary greatly with individuals, continued research is needed in order to ensure the maximum use of the forest with the greatest economy of operation and above all the prevention of deterioration of the forest environment.

This study is concerned with the use of forest land for recreation. Morgan Arboretum was not set up as a recreational playground. It was originally an outdoor botanical laboratory associated with McGill University. Only foresight on the part of a few individuals prevented this tract of land from getting into the hands of land speculators.

Eventually the founders of the Arboretum realized that

the experimental program of the university would not be hampered if the public was admitted to the Arboretum. Therefore, two apparently competitive entities, forestry and recreation, were combined in Morgan Arboretum. (To give some indication of the size of the forestry operations some Arboretum production figures are included in the appendix.)

Review of Literature

Various authorities in the field of outdoor recreation attempt to explain why people participate in outdoor recreation while others attempt to account for who participates in outdoor recreation. Indeed it is of particular interest to examine their findings to determine whether or not they apply to the recreation study of Morgan Arboretum. Hauser (1962) stated that since city dwellers have less opportunity to participate in outdoor recreation than rural residents, they would be less represented in parks. Mead (1962) suggested that outdoor recreation is based upon man's desire to get away from it all. Green (1964) implies that the exodus toward the outdoors is based upon man's desire to reduce, temporarily, social contact with others. This reduced social contact is present in car camping, walking, or driving for pleasure. Hendee (1969) divides the environmentalists into two basic groups -- the utilitarian (or goal) oriented individuals and the activity oriented individuals. The rural people generally fit into the

former group because they are concerned with "harvesting" recreational activities such as hunting and fishing. The urban people are generally activity oriented. They are basically concerned with the social and aesthetic values of outdoor recreation. Burch and Wenger's theory (1967) uses the approach that "activities" which were pleasant during an individual's childhood will attract him as an adult. Therefore the people who had pleasant camping and hiking experiences as children would probably participate in the same activities as adults. Finally, Winthrop (1968) states that individuals brought up in an urban environment are less adventurous than those brought up in a rural environment and therefore less capable of reaping benefits from the rigors and challenges of outdoor recreational activities. They might reflect such an attitude by selecting certain types of paraphernalia which make outdoor recreation comfortable, such as car camping with most of the conveniences of city living.

At this point it is important to note that outdoor recreational research is only in its infancy. Most of the research in outdoor recreation has been carried out in National Parks, or American State Parks. These areas are distinctly rural environments usually far removed from urban or suburban zones.

The few existing studies of parks located relatively

close to large cities show that more time and effort are required to reach them than for users of Morgan Arboretum to get to the Arboretum. Thus the time gained by the shorter trip increases the total time for enjoyment and this might be an important factor in determining the users of urban forests such as Morgan Arboretum.

Morgan Arboretum is situated on the outward fringe of one of the largest and most populated cities in North America (Fig. 2). Therefore the research findings of most of the previous studies associated with outdoor recreation do not necessarily apply to Morgan Arboretum.

This study tested patterns of behaviour in users of Morgan Arboretum. It revealed significant data and trends. Although the primary aim of the study was to explore as many aspects of users' behaviour as possible, a study was also made of users' attitudes to outdoor environments.

The results obtained from this study indicate that there is an increasing demand for more natural forested environments in close proximity to large populations in order to satisfy the needs of the people. Furthermore, even though users of the Arboretum represent the upper income brackets of the country and are interested in conservation of the outdoors while they take pleasure in participating year-round in outdoor activities associated

with a natural environment, they nevertheless find satisfaction in a well-managed forest close to an urban centre.

HISTORY OF MORGAN ARBORETUM

Geographical Location

Morgan Arboretum is located at the extreme western tip of the Island of Montreal in the town of Ste. Anne de Bellevue. The property forms part of Macdonald College, the "suburban" campus of McGill University. To the immediate west of the Arboretum up to a distance of fifteen miles are the suburbs of Montreal known collectively as the West Island, a pre-dominantly English-speaking area in a city in which 70% of the population are French-speaking. The downtown area of Montreal is twenty-three miles east of the Arboretum (Figs. 2 and 3).

The Early Years*

Early History

The original property which is now known as Morgan Arboretum resulted from the consolidation of 21 farms--the typical long and narrow French-Canadian farms, half of which opened on Centre Road and half on Ste. Marie Road (Fig. 3). All these farms were consolidated into a single property by the late James Morgan, resulting in 352 acres of natural woods and farmland.

In 1915 the property was rented for the purpose of using the land as a dairy farm. This resulted in a slow

*Most of this section was compiled from various works by the late Dr. W. H. Brittain.

deterioration of the land and its woodlot due to poor land and forest practices.

In 1941 McGill University investigated the possibility of acquiring Morgan's property for the purpose of assuring the permanent preservation of the woods. In 1945 the arrangements for purchase of the land were finally completed. The total area was 909.8 acres plus another 2.86 acres for nursery purposes.

When "Morgan Woods" (as it was first called) was finally laid out, it consisted of 362 acres. This included 100 acres to be used for reforestation purposes and 23 acres to be kept as a natural ecological preserve never to be tampered with.

In 1944, a "Morgan Woods Advisory Committee" was set up to administer this large property. At the first meeting, which was held on October 25, 1944, various members expressed their views as to the future development of the Arboretum. The meeting resulted in four basic, but important, fundamental ideas which were to have a bearing on the future operation of the property. They were:

1. The area was too small to function as a "preserve" in the real sense.
2. In the management of the Arboretum, there was to be no such thing as "accepted practice" in land and forest management.

3. An "arboretum" is generally understood to be a collection of specimen trees. The Arboretum was not, at that time, a collection of trees and it was felt that it could scarcely be made such.
4. Since the "woods" do contain a collection of indigenous trees, it would be desirable to attach labels to a variety of trees, and these labels should include not only the name of the species but also other brief botanical and ecological information.

From 1945 to 1952

Between the years 1945 and 1952 there was some tree cutting in Morgan Woods in order to improve the property. This included some cutting of dead, dying and damaged trees. Some reforestation of both native and exotic species was undertaken. The University hired an experienced woodsman to ensure that the recommendations made by the Advisory Committee would be carried out satisfactorily.

By 1947 the Morgan Woods Advisory Committee realized that the acquisition of additional funds was of primary importance if plans for the development of the Arboretum were to be carried out. In light of this, it was decided that a special meeting should be held to which representatives of wood producing companies would be invited in order to convince them of the practical value of the arboretum project.

On October 10, 1947 the meeting took place. The Chairman explained that up to now the interest in the operation of the small farmers' woodlot had fallen somewhere between the interests of the forester and the agriculturalist. The forester was concerned with the forest while the agriculturalist was concerned with the improvement of the crops and livestock. The chairman pointed out that the small woodlot was actually all part of the total farm operation.

It became apparent that the majority of those present at the meeting were not moved by the chairman's remarks. They felt that this problem was mainly agricultural and of only minor interest to the wood producing industry. They could not be expected to support such a project and the Department of Agriculture was the proper agency to contact.

In spite of the committee's initial setback, Macdonald College did support the arboretum project within the limits of its means and resources. In 1947, 1948, and 1949, vigorous planting occurred on a sustained and experimental basis. A permanent foreman was hired to oversee all the operations.

From 1946 onward, there was first improvement of the woodlot itself, followed by clearing of brush-grown areas to allow for new plantings, the setting up of

specimen groups of native trees, and the development and utilization of the sugar bush. Fortunately, there were those who realized the potential of the "woods". A group of private citizens formed an association for the purpose of assisting the University to implement the arboretum project on a large scale. On February 11, 1952, the "Morgan Arboretum and Woodland Development Association" received its charter from the Provincial Government and Morgan Arboretum was here to stay.

As set forth in the charter, the Association constitutes a corporation for the following purposes:

1. To advocate and promote the conduct of teaching and investigation and research in arboricultural and silvicultural problems.
2. To aid and encourage the development of more scientific and profitable forestry practices and policies with particular regard to the interests and needs of a population in rural districts.
3. To assist and cooperate with McGill University in the establishment, maintenance and development of areas or woodlands on and about the Island of Montreal, with particular regard to that woodland area owned by the said University and known as "Morgan Arboretum".
4. To urge and encourage all phases of forest research to stimulate public education and interest in forestry matters.
5. To encourage and assist in the development of experimental and demonstration woodlots under approved methods of management.
6. To promote understanding on the basis of sound land use and of the importance of maintaining under timber growth, those areas more useful for tree crops.
7. To stimulate through methods of demonstration

and local instruction a wider knowledge of how farm woodlots may profitably be developed.

8. To receive, acquire and hold, gifts, devices and bequests.
9. To do such other things as are incidental or conducive to the attainment of the above objects.

The corporation will operate without financial gain to any of its members, and any profits or other accretions will be used solely for the promotion of the purposes and objects of the corporation.

From 1953 to the Present

Morgan Arboretum today consists of 528.8 acres made up of 440.4 acres of productive land and 88.4 acres of non-productive land. Since Morgan Arboretum is closely linked to the work in woodlot management there is a concentration of Canadian trees. For example, one area is filled with pines, another contains various species of spruce, while another contains fir trees of many types. The hardwoods are represented by the maples (silver, red, hard, striped), the poplars, the willows, the oaks, the beech and the nut trees (walnut, filbert, hazel, chestnut, hickory, heartnut). Foreign species are also included where they have real or potential importance for pulp and paper, lumber or landscape horticulture. Morgan Arboretum today is an outdoor laboratory for students of the University and furnishes excellent

facilities for practical instruction in the field. The visitor to the Arboretum will not find every exotic species but will find every native species which can survive in our climate. Different ecosystems are extremely obvious. However the untrained observer will not see the many features which are of special interest to the student of plant ecology.

Membership Today

With the exception of one year (1967), there has been a steady increase in the total number of paid-up members (Table 1). There are eight types of memberships ranging from a single membership (\$12) to a family membership (\$30) to a life member (\$5000). The low fee has made it possible for a great number of people to benefit from the enjoyment of the outdoors in a private and well-managed environment. There has never been a public request or solicitation of members but rather, word-of-mouth and general good-will on the part of the members, the officers, and management, has resulted directly in the increase of total memberships.

* * * *

When the original charter was granted none of the aims concerned itself specifically with the preservation of

the land for recreational use. Today, Morgan Arboretum is mainly used as a recreation area by people of all age groups. Its main source of revenue is from members who are not only interested in preservation of the land against possible exploiters but who also take pleasure in spending a few hours in a relatively quiet natural forest environment away from a fast moving, noisy and dirty urban environment. Therefore a re-evaluation of the aims and objectives of the Association is necessary in order for it to include the wishes of the users.

TABLE 1

Membership Since 1952

Year	Number of Members	Number of Corporate Members	Other	Total	% Increase over Previous Yr.
1970	835	42	19	896	7.1
1969	780	40	19	839	3.3
1968	755	39	19	813	20.4
1967	627	32	?	659	-11.1
1966	705	30	?	735	7.3
1965	657	30	?	687	13.7
1964	578	36		614	12.9
1963	512	38		550	18.5
1962	432	37		569	15.5
1961	374	39		413	87.0
1960	200	39		239	2.6
1959	195	35		230	5.4
1958	185	30		215	5.7
1957	175	32		207	43.4
1956	122	22		144	10.9
1955	110	20		130	23.6
1954	89	18		107	30.9
1953	68	5		73	1260.0
1952	5			5	

BEHAVIOURAL PATTERNS
Research Methods and Analysis

Two types of research methods were used in this study, questioning and direct observation. Direct observation was useful in determining behavioural characteristics of the users in an outdoor environment. This technique was used during the entire year under all weather conditions so that a good cross-section of behavioural types was observed. The results of this method were checked against the responses to the questionnaire to see whether the users' observed behaviour in the outdoors differs from the users' behaviour as indicated in the friendly and more comfortable confines of their homes. In general, there was a high correlation between observed behaviour and the statements, thus supporting the veracity and therefore the usefulness of the questionnaires.

The major research tool in this study was the questionnaire. Various ways of interviewing the users were employed. One questionnaire was mailed directly to the homes of members. Of the 1080 questionnaires mailed to members, 502 responded (46.5%). According to Oppenheim (1966) late responses resemble both early responses and non-responses so that no adjustments relating to time were deemed necessary (See Appendix for samples of questionnaires).

A second questionnaire along with a stamped return envelope was given to all users (both members and non-members) as they entered the Arboretum. Of 198 questionnaires distributed, 153 were returned (77.3%).

A third method of questioning users was the personal interview in the Arboretum. Some items were repeated in all three questionnaires to see whether there were any discrepancies in the responses. Several items were not used in any final analysis since they seemed not germane to the main study or in other cases, the response to some items was too low to enable me to reach any valid conclusions. In all cases the Chi Square test was used to evaluate the significance of the responses.

Control Group

In order to examine whether or not Arboretum users differ in their behaviour from non-users, the users of Beaver Lake were observed. Beaver Lake is a small part of Mount Royal Park, a large, forested, public city park in the centre of Montreal (Fig. 2). Not only is it larger than Morgan Arboretum but it contains more facilities for year round activities and "comfort". The Beaver Lake users were asked a minimum of questions.

Socio-Economic Make-Up of Arboretum Users

Education

Arboretum users were categorized into three educational

levels, public school or less, college or university, and post-graduate (Fig. 4). The majority, that is 86% of the members and 84% of non-members, were university educated. The number of members with post-graduate education was significantly greater than that of non-members. The education level of Arboretum users is much higher than that of a typical U.S. Park (Hewston, et al., 1969), however the composition of the users of the University of Washington Arboretum was similar to that of Morgan Arboretum (Twight, 1968) which is more reminiscent of a botanical garden in an urban environment.

Annual Income

The annual incomes of the principal wage earners of the Arboretum users' families were obtained (Table 2). Intervals of \$2000 were used in order to get as precise an amount as possible. The difference between the incomes of the members and non-members within the first four categories was not significant. A significantly larger number of non-members earned \$12,000 to \$13,000 while there were significantly more members than non-members in the \$14,000 and over range. When compared with a typical U.S. Park (Hewston, et al., 1969) these results were very different in all categories. The annual incomes of the principal wage earners in the families of the University of Washington Arboretum (Twight, 1968) was much higher than the incomes of users of public parks

but somewhat lower than users of Morgan Arboretum. These conclusions are not significantly biased by differences in monetary values between the two countries.

TABLE 2
Research Income Percentage

	<u>Morgan Arboretum</u> <u>Members-Non-Members</u>		<u>U.S. Park</u>	<u>University of</u> <u>Washington Arboretum</u>
Under \$4000	0	0	I	I
\$4,000-\$5,999	0.2	0	76.7	60.2
\$6,000-\$7,999	2.5	5.3	I	I
\$8,000-\$9,999	6.1	5.9	I	I
\$10,000-\$11,999	8.1	13.2	6.7	17.4
\$12,000-\$13,999	9.8	23.5	4.1	I
Above \$14,000	73.2	52.1	5.6	22.4
Total	100.0	100.0	100.0	100.0

Occupations

The occupations of the principal wage earners of Arboretum users' families were primarily managerial or self-employed and professional (Table 3). This combined group made up 61.5% of the total. The users of the University of Washington Arboretum (Twight, 1968) had similar occupations and this professional group made up 50.1% of their total. The users of St. Lawrence Islands

National Park (Taylor, 1967) were primarily skilled labourers, sales or clerical workers, while professionals were a proportionally less important user group than they were in the Arboretum.

TABLE 3

Occupation Percentage

	Arboretum Users	St. Lawrence Islands National Park	U.S. Arboretum
Managerial or Self-employed	6.0	10.0	10.0
Professional	55.5	24.5	40.1
Retired	3.2	6.4	7.9
Skilled, semi-skilled sales or clerical	15.7	45.4	31.2
Other	19.6	13.7	10.2
Total	100.0	100.0	99.4

Place of Residence and Distance Travelled

The place of residence of Arboretum users was divided into three categories, urban, suburban, and rural. The results of the mailed questionnaire and on-the-spot questionnaire were similar (Table 4) and showed that over 70% of Arboretum users are suburbanites. The same question when asked of Beaver Lake users showed that they were mainly urbanites. The fact that the mail and on-the-spot questionnaires gave the same results indicated that among

the members distance was not a critical factor in limiting the use made of the Arboretum. Therefore visiting and not necessarily membership is a function of distance.

TABLE 4

	<u>Place of Residence</u>				Sample Size
	% Urban	% Suburban	% Rural	% Not Sure	
Morgan Arboretum (Members)	23.3	73.6	1.0	2.1	504
Morgan Arboretum (Non-Members)	27.0	70.4	1.6	1.0	269
Beaver Lake	80.7	9.2	3.2	6.7	580

The number of visits made by members and non-members to Morgan Arboretum and the users of Beaver Lake diminished with distance travelled from their starting point (Fig.5). This is the same pattern as that found in National Parks (Nixon, 1967 and Taylor, 1967). The results of the three studies are the same, the former being on a micro scale, the latter two on a macro scale (Fig. 6).

Users Activity Parameter in Morgan Arboretum

Ninety-five per cent of Arboretum visits other than in organized nature tours are made on weekends. Since the appearance of the site was altered by climatic seasonal changes it was of particular interest to see how the user population total was altered during the seasons and also to determine the time spent for recreational use. In order to obtain this information four factors had to be determined. They are, the total seasonal users, the size of the visiting group^{*}, the seasonal average time spent by group, and the total seasonal recreational hours spent in the Arboretum.

Weekend counts of groups entering the Arboretum were kept by the gatekeeper on duty. Since there is only one entrance and one exit the gatekeeper's record is a reliable count of the number of groups entering and leaving the Arboretum. Ninety-five per cent of the Arboretum visitors arrived by car. The remaining 5% entered walking, cycling, in a taxi or on horseback.

The data collected during a one year period gave us details of the proportion of members, non-members, and

* A "group" refers to a single person, a number of people, or more than one family, who come as a unit and leave as a unit. They may or may not have participated in the same type of activity.

TABLE 5

Total Number of Groups Entering Morgan Arboretum
(Total of 26 Weekends Evenly Distributed Over The
Seasons)

<u>TIME</u>	<u>MEMBERS</u>	<u>NON-MEMBERS PAYING ENTRANCE FEE</u>	<u>ADMITTED FREE</u>	<u>OTHER</u>	<u>TOTAL ENTERING</u>	<u>TURNED AWAY</u>
9 - 9:30	136	15	21	5	177	9
9:30 - 10	155	21	70	20	266	9
10 - 10:30	221	30	76		327	21
10:30 - 11	336	45	61	24	466	33
11 - 11:30	420	71	64		555	43
11:30 - 12	333	64	68		465	60
12 - 12:30	355	62	46	47	510	48
12:30 - 1	344	52	52		448	57
1 - 1:30	217	81	40		338	58
1:30 - 2	317	79	71		467	44
2 - 2:30	305	83	65		453	59
2:30 - 3	307	77	90		474	124
3 - 3:30	204	28	105	3	340	78
3:30 - 4	129	17	72		218	81
4 - 4:30	90	17	27		134	54
4:30 - 5	13	1	14		38	3
TOTAL	3882	743	942	99	5666	781
% of Total	60.5	11.5	14.6	1.7	87.9	12.1
% of Total Entering	68.5	13.1	16.6	1.8	100.0	

those users admitted free of charge (University personnel and students of Macdonald College) who used the Arboretum. Of the total number of groups entering, 68.5% were members and 13.1% were non-members who paid a parking fee. Twelve point one per cent of the groups coming to the Arboretum refused to pay the fee and hence were turned away (Table 5).

Group Make-Up, Time Factor and Recreation Hours

In addition to the gatekeeper's record of number of groups coming to the Arboretum, an observer recorded the number of people in each group and the time each group entered and left the Arboretum. The data collected during a one year period were divided into the four seasons, June 21 - Sept. 21, - Dec. 21, - March 21. This was done to detect any seasonal variations in user's behaviour. The seasonal periods of use are recorded in Fig. 7.

The data presented in Table 6 reveal definite recreational trends. The Arboretum was visited by the greatest number of people during the spring. This results in the largest number of recreation hours spent in the Arboretum. Of the total recreation time spent during the entire year, 42.1% of the total was enjoyed during this season. At the other extreme as the summer season followed, there was a rapid drop of visits resulting in the fewest number of recreation hours or 8.2% of the total time spent

for recreational enjoyments (even though this season had the greatest number of daylight hours). It should be pointed out that since Arboretum users are in the higher income brackets (Table 2) there is a greater probability that their summer recreation time would be spent elsewhere away from the city or its immediate surroundings. This would account for the sharp decrease in recreation hours. At the same time it must be pointed out that the average time spent by individual groups was also at its lowest during this season of the year. Therefore one must look elsewhere for possible reasons for this sharp decline.

In winter the average number of people per group (2.72) was lower than that of other seasons of the year, while the average time spent by individual groups was highest (Table 6). When average time per group was compared with average number of people per group there was a definite positive correlation between the two during the spring, summer and fall months (the larger the group the more time users spend), but a negative correlation during the winter months (Fig. 8 and 9). These data are useful in that one could almost predict the length of time visiting groups would spend recreating in Morgan Arboretum.

Mean group size per season when compared with

TABLE 6

Seasonal Recreation Use

	Total No. Of People	Estimated * Seasonal Use	Total No. of Groups	Average No. of People per group	Average Time Spent (min.)	Total Recreation Hours	% Annual Recreation Hours
	(a)	(b)	(c)	(a)/(c)	(e)	(b)x(e)	
Spring	1942	8444	594	3.26	88.7	748,983	42.1
Summer	1783	2110	579	3.08	70.2	148,122	8.2
Fall	2513	5440	791	3.17	83.1	452,064	25.5
Winter	1800	4675	662	2.72	91.7	428,698	24.2
Annual							
Total		21,679 †	2626			1,777,867	100.0

* Corrected to estimate total seasonal use.

† Statistically this number is within less than 1% error of the gatekeeper's actual count (21,738).

average time spent was shown to have a linear relationship during summer (smallest), fall and spring (largest). Winter's mean group size was very small when compared with average time spent (Fig. 10). These data show that variations in average group size when compared with average time spent were more important in spring and less important in summer. Also, variation in group size is proportional to seasonal use when the aesthetic*appeal of the site is considered (Fig. 11).

Activities

With the exception of the annual sugaring-off party in April there are no organized recreational activities in the Arboretum. Therefore each recreationist uses the site as a source of recreation in his own way. His activity is regulated by the limitations of the environment. The question I asked was simply, "List the activities you participated in when you came to the Arboretum".

In order to include all possible types of activities two methods of questioning were used. During the summer and fall in the Arboretum, the open-ended question was used. The respondents were asked to list the activities they had participated in or enjoyed the most at Morgan Arboretum. During the winter and spring, the closed type question was used. Respondents were asked to check off

* The term aesthetics is consistently used in the sense of pure emotion and always treated positively.

from a list provided those activities they had participated in as well as those activities they enjoyed most. The second type of questionnaire was to be completed at home and returned in the mail. The questions were asked during different seasons of the year to determine whether the respondents were influenced by the seasons.

The results of the two types of questioning were extracted from three questions as follows:

(a) Why did you become a member of Morgan Arboretum?

(b) Which activities do you participate in when you come to Morgan Arboretum?

(c) Why do you spend time in Morgan Arboretum?

There was a certain amount of overlap (sometimes activities were ill-defined) in the replies to the questions. This overlap was expected as questions were worded in such a way as to obtain all possible reasons for coming to the Arboretum.

In taking into account the total activity of the 12-month period, it appeared that there were two distinct types of recreation, namely aesthetics and activity. Although some people were concerned with either one or the other there was considerable overlapping and most recreation was a combination of aesthetics and activity. For purposes of evaluation, the recreation list was grouped into three categories--'pure activity', 'pure

TABLE 7

Total Activity

<u>Pure Activity</u>	<u>Percent of Total</u>	<u>No. of Responses</u>
Skiing	7.6	
Snowshoeing	4.4	
Sugaring-off	4.3	
Walking dog	3.0	
Jogging	2.1	
Cycling	0.5	
Horseback riding	0.2	
Total	22.1	1522*
<u>Pure Aesthetics</u>		
Quiet solitude	10.2	
Fresh air	8.3	
Rustic smell	5.1	
To see wildlife	3.9	
See leaves change colours	2.2	
Enjoyment of nature	0.9	
Total	30.6	2107*
<u>Aesthetic-Activity</u>		
Walking for pleasure	20.1	
Collect things	5.6	
Family solidarity	5.3	
Photography	5.2	
Picnic	4.5	
Bird watch	3.9	
Total	44.6	3070
<u>Other Activities</u>	2.7	185
Total for all activities		100.0% 6884

* Responses for 'Pure-Activity' and 'Pure-Aesthetics' were not equal since respondents replied to those items which they had participated in only.

aesthetics', and 'aesthetic-activity' as shown in Table 7.

The greatest percentage of total recreation (44.6%) over the 12-month period included recreation which incorporated a combined aesthetic-activity quality. In comparing pure aesthetics with pure activity a greater percentage of users preferred the pure aesthetic quality (30.6% versus 22.1%).

Since the average time spent per group was highest in winter (Table 6) when the aesthetics were at its lowest point (Fig. 12 and 13) the longer time which was spent could not have been related to pure aesthetics and therefore must have been related to pure activity or aesthetic-activity. Since most aesthetic-activities were enjoyed on a year round basis it followed that the increase in time spent during the winter must have been more closely related to 'pure activity'.

In studying the data relating to 'pure activity' more than 50% of the total 'pure activity' for the year involved winter sports. It therefore can be concluded that the reason that winter utilization is so high is because of the availability of facilities for 'pure activity' during the winter months.

The major single activity which the greatest percentage of recreationists participated in during the

entire year was 'walking for pleasure' (20.1%). The item 'quiet solitude' ranked second (10.2%). When these two items were combined, it indicated that over 30% of the people came to the Arboretum for both the walking activity, which was partly aesthetic in nature, and the pure aesthetics of quietness. It was true that for the most part users could 'walk' in their own neighbourhood (data from questionnaire) but they would probably not enjoy the pleasant quiet surroundings of the Arboretum. Add to these factors the fresh air and rustic smells (Table 7) and what emerges is the reason that walking is Morgan Arboretum's major single activity.

Activities as Related to Areas

The 'observation method' was used to determine the areas of the Arboretum most heavily used. Groups leaving the Arboretum were given a detailed map of the property (see appendix) and were asked to outline the exact route they had taken during their visit. Every trail, path, and road was measured (in feet) so that the total distance travelled by individual groups was also kept so that time could be correlated with distance travelled. The type of activity engaged in was seen to relate to both the time spent and the distance travelled.

When this information was plotted on a scatter diagram (Fig. 14) four clusters emerged. The largest

(that which included the largest number of points) was called 'walkers'. This included all types of walking activities such as bird watching, photography, nature study, and snowshoeing. A second cluster called 'picnicking' (bottom right cluster) comprised those who did little walking but spent a lot of time in the Arboretum including bird watching and photography. Tobogganers and picnicking and those who recreated in one spot were also included in this group. A third cluster called 'joggers' (top left cluster) spent little time in the Arboretum but covered a lot of area in the process of their form of recreation. A fourth cluster was called 'skiers' (top right cluster). This group included skiers and snowshoers. They remained in the Arboretum the longest time and travelled the greatest distance.

Using the 1263 maps obtained, percentages of usage were calculated by dividing the number of visits made by the groups, by the total number of samples. Winter and summer maps were kept separately because conditions in the Arboretum were vastly different. All samples were taken from the parking lot.

Two main conclusions emerged from this data. In the first place, the "main circuit" and the area around Chalet Pruche and Dale Field proved to be the most

popular routes. The "main circuit" is a wide gravel road sheltered by tall trees. It is 1.70 miles and seems to be just the right distance for most of its users. There is no danger of getting lost nor is it necessary to retrace one's steps. In other words, it circles the Arboretum. Dale Field and the area around Chalet Pruche form a grassy area which attracts picnickers who enjoy the fruit trees and benefit from their shade. The area also provides the pleasant smelling evergreens. In winter Chalet Pruche was opened to visitors who wanted hot coffee and so this added to the popularity of the route during the winter months.

The second conclusion arrived at is that during the winter there is a far greater general usage of the property than at any other season (Figs. 15 and 16). This is related directly to type of activity (i.e. skiing and snowshoeing). The lack of general usage in summer is probably due to a few fundamental reasons. Firstly, as recorded earlier, the biting insects in the bushy and damp areas annoy the users. Secondly, during the summer more single groups visit the Arboretum than during the winter season. As previously shown in Fig. 9 the larger the visiting group the longer the time spent for recreation. Thirdly, the wet areas prevent users from going on and hence they are forced to turn back. Finally, the horses used by horseback riders leave large hoof holes which fill up with water and thus make the trails less pleasing to use. For these reasons, the aesthetic appeal of the Arboretum is

diminished, the time spent is reduced and the total recreation time is small.

The distance Arboretum users travel varies with climatic and resulting environmental conditions (except for picnickers). On hot humid days when walking itself is difficult the added inconvenience of the biting insects results in an average distance of only 0.68 miles. This distance travelled is statistically lower than distances travelled at other times of the year (Table 8).

TABLE 8

Average Distance Travelled in Morgan Arboretum

	No. of Groups Recorded	Average Distance Travelled
Spring	282	1.55
Summer	366	0.68
Fall	390	1.79
Winter	225	1.82
Total	1,263	

ATTITUDES OF ARBORETUM USERS

Method

A greater portion of this study has been devoted to a detailed account of users' behaviour in Morgan Arboretum. The key to understanding behaviour in recreational areas lies in the understanding of people's perception of their environment. We assume people choose a recreational site on the basis of how desirable they think the place is. People perceive outdoor recreational sites in different ways. Their purposes for participating in recreational activities, their standards of desirability, and their willingness to make the effort to accept standards which may not be acceptable to them are major parameters which affect their attitudes.

In order to evaluate the attitudes of users of Morgan Arboretum it was necessary to take into account a large number of possible factors which could influence their perception of the area. Three attitude tests were devised in order to see whether the users' attitudes did, in fact, coincide to some degree with their behaviour. These tests were:

(a) User's Attitude Toward Morgan Arboretum.

The questionnaire consisted of 30 items arranged in five groups called factors (see appendix).

The questions were used to determine the attitudes of users to Morgan Arboretum. Data of members were compared to that of non-members to ascertain whether any differences in attitudes appeared.

(b) User's Attitude Toward Any Forested Environment.

The questionnaire consisted of 60 items which were ultimately arranged into nine groups. The questions were used to determine users' attitudes toward any forested environment. Attitudes of non-users (teachers and students) were used as a control in order to determine whether users' attitudes differed from that of non-users.

(c) User's Reaction to Current Government Recreational Laws. The questionnaire consisted of four items used to test attitudes toward government recreational laws in the areas of hunting, fishing, and snowmobiling. Again, attitudes of the control group (teachers and students) were compared with attitudes of Arboretum users.

Distribution of User's Attitude Questionnaire

During the late fall and early winter a mimeographed group of statements in a stamped, self-addressed envelope was distributed to Arboretum users, whether or not they were members of the Morgan Arboretum. On several occasions, because the weather was cold, the Arboretum chalet

(Chalet Pruche) was open to any recreationist who wished to warm himself near an open fire with a cup of hot coffee. Here, the envelope containing the statements was distributed after a verbal explanation of the aims of this particular study. No doubt the congenial atmosphere prompted the resulting high rate of response (77%). On other occasions envelopes were handed out to recreation users in the parking lot, and in this case an equally high response (71%) was obtained.

Results of Factors

Factor 1 -- Obligations and/or Duty

Statements 1 to 4 (Table 9) were worded to obtain a positive response. Statements 1 and 2 were intended to see whether users feel a sense of responsibility for the behaviour of other users. In this case a significant percentage (84%) felt they should say something to anyone misusing the area, but only 50% felt they should actually make an effort to stop people from swinging from the bough of a tree.

Statement 3 was intended to see whether a spirit of cooperation exists in a forested environment. Sixty percent of the users felt that they should remove the trash left by previous visitors. However, since trash cans are placed in two locations only, specifically, in the parking lot and near Chalet Pruche, a common remark to this

TABLE 9

Statement		Obligations and/or Duty									
Number	Statement	Agree			No opinion			Disagree			
		Members	Non-Members	+	Members	Non-Members	Total	Members	Non-Members	Total	
1	If you see a person in the Arboretum doing something he shouldn't do, you should say something to him.	* 86.2	* 83.1	* 84.7	4.3	7.2	5.6	9.5	9.7	9.7	1 69
2	If you see a person swinging from a bough of a tree it is your duty to stop him.	47.3	53.7	50.3	21.5	16.3	19.1	31.2	30.0	30.6	1
3	Trash left by previous Arboretum users should be removed by other users so that the place should be left clean.	62.3	57.1	59.9	14.0	10.7	11.9	23.7	32.2	27.7	
4	If you see a horseback rider galloping at a dangerous speed, it is your duty to stop him.	39.8	41.8	40.7	22.6	17.7	20.3	37.6	40.5	39.0	
5	Campfires should be permitted in special designated places.	45.2	50.6	47.8	7.4	9.6	9.6	47.4	39.8	43.9	

* Significant at the 5% level

† No. of responses = 201

statement was, "Where would I put the trash?"

Statement 5 is an absurd statement, and many respondents recognized this. Yet 41% felt that it is their duty to stop a galloping horse. It is worth mentioning, however, that a significant 84% of the respondents felt that horseback riders should be on specifically designated trails (Table 14). If this were so, any danger of galloping horses on walking trails would be eliminated.

Factor 2 -- Behavioural Controls

The purpose of statements 5 to 13 (Table 10) was to test whether Arboretum users accept or reject the idea of behavioural controls. In general, the recreationists endorsed the concept of control. However, there was a discrepancy between members and non-members as far as the use of the grounds is concerned (Statement 11). Surprisingly 86% of the members felt the Arboretum should be open to anyone at any time, but only 50% of the non-members felt that way. This suggests that members, who may be more conservation minded than non-members, are more ready to share the open spaces with everybody, even the "one-day recreationist".

Even though there are no restricted areas in the Arboretum the users were split on the idea of restricted

TABLE 10

Behavioural Controls

Number	Statement	Agree			No Opinion				Disagree		
		Mem.	Non-Mem.	Total	Mem.	Non-Mem.	Total		Mem.	Non-Mem.	Total
6	All unleashed dogs causing a disturbance should be leashed.	*	*	*							
		79.6	86.6	84.3	11.8	3.2	8.0		8.6	9.7	9.1
7	There should be no restricted areas in the Arboretum.										
		32.6	32.1	32.4	19.5	19.8	19.8		47.8	48.1	48.0
8	A person making a campfire and taking natural precautions should be given permission.								*		
		17.0	17.5	17.2	2.1	8.8	5.2		80.9	73.7	77.6
9	A person should be allowed to run his dog unleashed even though there is a rule to the contrary.										
		22.8	24.4	23.6	10.9	4.9	8.0		66.3	70.7	64.8
10	Horseback riders must stay on designated trails.	*	*	*							
		87.2	80.7	84.2	3.2	6.0	4.5		9.6	13.3	11.3
11	The Arboretum should be open to anyone at anytime.	*									
		85.6	49.8	68.8	1.1	12.5	6.5		13.3	37.7	24.7
12	All persons including members wishing to use the Arboretum must first check in for permission										
		64.9	73.2	68.8	5.3	12.2	8.5		29.8	14.6	22.7
13	A person should be free to cut brush or limbs from trees as long as they do not create an eyesore.								*	*	*
		3.3	2.4	2.9	0.0	1.2	0.6		96.7	96.4	96.6

areas (statement 7). Thirty-two percent felt there should be no restricted areas. On a test conducted earlier in which the same statement was worded positively (i.e. There should be restricted areas in the Arboretum) similar results were obtained.

One of the few rules which the membership has formulated states that dogs must be leashed. (A limited number of members know the rule, but even those who do, ignore it.) This is reflected in statement 9, where 23% of the members felt that dogs should be allowed to run unleashed even though there is a rule to the contrary. Of this number 95% are dog owners. Yet significantly, 84% do not like to be annoyed by dogs and so they will tolerate the dogs only as long as they are not annoyed by them.

No recreationist and/or conservationist felt limbs should be cut from trees by users of the forested area. This "wilderness-purist" trait manifested itself in statement 13 where a significant 97% did not like to see cut limbs of trees. The result is interesting in view of the cutting operations which take place in the Arboretum (see appendix).

Factor 3 -- Purist Symbols

Statements 14 to 18 (Table 11) attempted to determine to what degree recreation users wish to have Morgan Arboretum

Purist Symbols

TABLE 11

Number	Statement	Agree				No Opinion				Disagree			
		Mem.	Non-Mem.	Total		Mem.	Non-Mem.	Total		Mem.	Non-Mem.	Total	
14	Portable radios should not be permitted in the Arboretum.	76.3	77.5	76.9		9.7	8.8	9.3		14.0	13.7	13.9	
15	Barking dogs and yelling people do not belong in the Arboretum.	70.2	76.5	73.1		10.6	7.4	9.1		19.2	16.1	17.7	
16	Trails remove most of the fun of walking to a place.	3.2	2.4	2.8		7.5	8.4	8.0		*	*	*	
17	Picnic tables should not be placed anywhere in the Arboretum.	61.3	53.7	57.7		7.5	9.8	8.6		31.2	36.5	33.7	
18	Signs of any type (i.e. nature interpretation signs etc.) should be excluded from the Arboretum.	3.2	1.2	2.3		4.3	2.4	3.4		*	*	*	

remain a natural, unspoiled outdoor environment with the lack of outdoor conveniences associated with an outdoor environment.

The Arboretum users' attitudes toward this group of statements indicated that they do not want any noises such as radios, barking dogs and yelling people that will disturb other recreation users. The users did indeed indicate significantly that they want walking trails, trail signs and nature interpretation signs. It is also interesting to note that 58% of the users did not want picnic tables in the Arboretum. According to Hendee (1968) an agreement with this type of statements suggests that users are purist and hence have a non-utilitarian approach toward outdoor recreation (See Factor 5 -- Improvement). Therefore Arboretum users tend to be purists but are not completely so.

Factor 4 -- Reaction Toward Other Users

Statements 19 to 24 (Table 12) were generally member-oriented and were intended to see whether there would be any significant difference between reactions of members' and non-members' toward each other (statements 19, 20, 21, 22, and 23) and toward management policy in the Arboretum (statements 22, 23, and 24). Once again, there were no noticeable differences between the responses of the two groups.

Approximately 65% of the users agreed that Morgan Arboretum is not a private exclusive club (statement 19). At the same time and consistent with statement 19, a significant 88% felt that anyone should be allowed to use

Reaction Toward Other Users

TABLE 12

Number	Statement	Agree			No Opinion			Disagree		
		Mem.	Non-Mem.	Total	Mem.	Non-Mem.	Total	Mem.	Non-Mem.	Total
19	I consider Morgan Arboretum to be a private exclusive club open to a limited number of members	29.0	14.3	23.1	14.0	9.5	12.2	57.0	76.2	64.7
20	Non-members should be allowed to use the Arboretum on payment of an entrance fee.	* 90.1	* 86.4	* 88.4	3.3	2.5	3.0	6.6	11.1	8.8
21	Members should have the right to see that other members are suspended from the use of the property when they break rules.	56.2	56.8	56.4	20.2	21.0	20.6	23.6	22.2	23.0
22	Members only should decide how the property should be used.	40.5	31.0	35.9	10.1	19.0	14.5	49.4	50.0	49.7
23	Members only should formulate the management policy of the property.	36.7	32.9	34.9	11.1	18.3	14.5	52.2	48.8	50.6
24	Since the Arboretum was set aside for recreation use, no university research should be permitted here.	1.1	0.0	0.6	2.2	8.4	5.2	* 96.7	* 91.6	* 94.2

the Arboretum (statement 20).

In general it appears that recreation users do not want the sole responsibility of policy formulation (statements 21, 22, and 23). For the users the Arboretum is a recreation playground and the environment is to be appreciated. However, although they do not want sole responsibility, they wish to be included in policy formulation. This fact was indicated by many members who, in response to statement 23, answered that members in conjunction with management should formulate management policy.

The response to statement 24 significantly indicated that users feel university research should be permitted in the Arboretum. This can be explained by the fact that most Arboretum users are university educated (Fig. 4) and hence tend to be sympathetic to university research.

Factor 5 -- Improvement

Statements 25 to 30 (Table 13) were intended to test what users' reactions might be toward any improvement to the Arboretum. The statements referred to additions to trail signs and/or markers, a nature centre, picnic tables, and benches. None of the statements included such "modern" conveniences as flush-toilets, a picnic centre (in case of rain), paved roads, or a log cabin perhaps with restaurant conveniences. "Modern" factors were omitted because users

TABLE 13

Improvement

Number	Statement	Agree			No Opinion			Disagree		
		Mem.	Non-Mem.	Total	Mem.	Non-Mem.	Total	Mem.	Non-Mem.	Total
25	There should be more trail signs.	44.0	28.0	36.4	28.6	34.2	31.2	27.4	37.8	32.4
26	The trail markers should have pictures rather than names.	15.7	7.3	11.7	44.9	43.9	44.4	39.4	48.8	43.9
27	The Arboretum should be more of a "Nature Centre". We should stock it with wildlife, and place nature interpretation signs in strategic spots.	50.0	59.0	54.4	25.6	19.3	22.5	24.4	21.7	23.1
28	Chemical toilets should be placed in <u>ONE</u> spot for use by the public.	72.1	68.5	70.6	14.4	11.0	12.9	15.5	20.5	16.8
29	Picnic tables should be placed in <u>ONE</u> spot for use by the public.	46.7	42.4	44.6	7.8	15.2	11.4	45.5	42.4	44.0
30	Benches should be placed in various places throughout the Arboretum.	46.6	59.8	53.0	9.1	3.7	6.5	44.3	36.5	40.5

had indicated their negative reaction toward this type of improvement in the past (in pre-test conversations with users).

According to statistical analysis, the results of the Improvement Factor are inconclusive. It appears from the figures in Table 13 that, except for statement 28 which indicates the desire for chemical toilets, users were evenly split on the need for improvements. Since there was no clear-cut conclusion in favour of improvements, the factor seems to indicate once again a 'purist' attitude by many users, that is, a non-utilitarian approach to outdoor recreation (see Factor 3).

Summary of Attitudes

In analyzing the reactions of Arboretum users toward certain factors (Table 14), it is important to remember that the behaviour of people does not always coincide with their attitudes. This fact makes the questionnaire somewhat artificial. On the other hand, when a response appears either positively or negatively within the 80th plus percentile, one can reasonably attribute that particular attitude (response) to be consistent with one's probable behavioural pattern (Hendee, 1968). For example, 84% of the sample felt that "a person who is seen to be doing something he shouldn't do, should be told not to by other recreation users". There is no doubt a lesser number of users would actually take the trouble to say something but, more important, the probability

that the users would say something to the misusers is greater than if they had ignored it.

Most of the results of the tests indicated trends on the part of Arboretum users. Some results are statistically significant (Table 15) while others show a definite correlation between attitudes and behaviour.

An attempt was made to see whether the responses of members to any of the statements varied from the responses of non-members, therefore separate data sheets were used for each group. No appreciable differences were noted in most of the responses to statements.

TABLE 14

<u>Factor Number</u>	<u>Statement No.</u>	<u>Factor</u>
1	1 to 4	Obligations and/or Duty
2	5 to 13	Behavioural Controls
3	14 to 18	Purist Symbols
4	19 to 24	Reaction Toward Other Users
5	25 to 30	Improvement

TABLE 15

Summary of Significant Statements

	<u>AGREE</u>			<u>NO OPINION</u>			<u>DISAGREE</u>		
	Member	Non-Member	Total	Member	Non-Member	Total	Member	Non-Member	Total
1	*	*	*						
2									
3									
4									
5									
6	*	*	*						
7									
8							*		
9									
10	*	*	*						
11	*								
12									
13							**	**	**
14									
15									
16							*	*	*
17									
18							**	**	**
19									
20	*	*	*						
21									
22									
23									
24							**	**	**
25									
26									
27									
28									
29									
30									

* Significant at 5% level

** Significant at 1% level

USER'S ATTITUDE TOWARD ANY FORESTED ENVIRONMENT

It is important to know Arboretum users' attitudes toward any outdoor environment in order to be able to predict the use of the Arboretum in the future. Also, if users' attitudes can be differentiated to some degree from non-users' attitudes, then the possibility of predicting reactions to management policies is greatly improved.

In order to evaluate users' responses to questions, an Attitude Tendency Scale was devised. This measurement is a modification of a similar scale used in a study involving attitudes toward an environment (Hendee, et al., 1968).

Sixty items describing various features of the outdoors were selected. These were:

- (a) features associated with a natural environment
- (b) features associated with a developed environment
- (c) features associated with one's personal attitude toward the environment.

The sixty items were then listed in random order and the respondent was asked to indicate whether he 'favours', 'dislikes', or is 'neutral' toward the item (see appendix).

For evaluation purposes only, the sixty items were then arranged into nine groups in an attempt to extrapolate the various likes or dislikes based upon certain collective

features of the items. Several items were included in more than one group which consequently resulted in a total of seventy-nine (79) items.

In scoring the test, a value of +1 was assigned to the 'favour' column, -1 to the 'dislike' column and 0 to the 'neutral' column. The total score of the entire questionnaire was obtained by adding up the respondents score and then dividing by the number of items (i.e. 60). In order to obtain a convenient numerical system, each score was multiplied by a factor of ten (10), so that in actual fact a perfect 'favourable' score had a value of +10.00, a perfect 'dislike' score had a value of -10.00, and a perfect 'neutral' score had a value of 0.00. This numerical scoring system was used to test individual items, groups of items, or items among social units.

Four social units were involved in this test in order to compare Arboretum users to non-users (Table 16).

TABLE 16

Social Units

<u>Social Units</u>	<u>Sample size</u>
1. Members of Morgan Arboretum	213
2. Non-Members but users of Morgan Arboretum	169
3. Elementary and high school teachers of the City of Montreal	240
4. Students from Sir George Williams (adult) Evening High School, Macdonald College, Grades XI and XII high school students, and an English language CEGEP	218

The ages of groups 1, 2, and 3 above ranged between 20 and 60 years, the student group ranged between 18 and 30 years with a mean of 22 years. There was no way of knowing whether any of the non-users do, in fact, come to Morgan Arboretum or any other similar environment. To say that the teacher group and student group are non-users merely means that they are non-users of Morgan Arboretum, but they may or may not be outdoor environmentalists. Consequently, in comparing Arboretum users to non-users, the test results of non-users may be slightly higher.

Pattern of Responses to an Outdoor Environment

Group 1 -- Rustification

The respondents who endorsed Items 1 to 7 (Table 17) are in favour of the rustic environment, the absence of people, the quietness of the outdoors, and the beauty of the landscape in general. There is a statistically significant indication that Arboretum users are more in favour of these items than non-Arboretum users. The Attitude Tendency Score indicates that Arboretum users scored higher on all items in this group. The results point out one important reason why people come to the Arboretum which is the quiet solitude.

TABLE 17

Rustification

Group I - Rustification 8.03

Items	Attitude Tendency Score			
	Teachers	Students	Non-Member	Member
1. Tranquility	9.20*	<u>7.88</u>	(9.51)*	9.43*
2. Solitude	<u>5.95</u>	5.96	8.54*	(8.69)*
3. Enjoyment of Nature	9.29*	<u>9.03*</u>	9.52*	(9.81)*
4. Absence of Manmade Features	<u>5.75</u>	7.21	7.80	(9.17)*
5. Vast areas and Enormous Vistas	7.12	<u>6.41</u>	8.39*	(8.57)*
6. Remoteness from Cities	7.64	<u>6.99</u>	8.23	(8.42)*
7. Absence of People	<u>4.31</u>	4.38	7.07	(7.96)*
MEAN	6.92†	<u>6.83</u>	8.44*	(8.91)*
		6.88		8.70*

* Significant at the 5% level

_____ Lowest Attitude Tendency Score

() Highest Attitude Tendency Score

† The mean was obtained from actual responses and not from the Attitude Tendency Score.

Group 2 -- Naturalism

The general attitude toward 'Naturalism' indicates that the Arboretum users were more appreciative of an untouched natural environment. Only the students (average age 22) were not attracted to these scenes, as indicated by the lowest scores in eight items (Table 18). It is

interesting to note that the results of this group of items clearly show a reciprocal relation to Group 8 (The Products of Human Workmanship - Table 24). The attitude toward a natural environment was favourable; the attitude toward manmade improvements was generally unfavourable.

TABLE 18

Naturalism

Items	Attitude Tendency Score			
	Teachers	Students	Non-Members	Members
1. Waterfalls and Rapids	<u>7.66</u>	7.79	(9.27)*	9.17*
2. Awareness of Beauty	9.64*	<u>8.65*</u>	(9.76)*	8.89*
3. Alpine Meadows	7.61	<u>5.95</u>	7.95*	(8.70)*
4. Drinking Mountain Water	<u>6.02</u>	6.92	6.85	(7.32)
5. Virgin Forest	<u>7.07</u>	7.55	8.00	(8.36)*
6. Natural Lakes	9.29*	<u>5.20</u>	9.27*	(9.77)*
7. Timberline Vegetation	6.33	<u>5.05</u>	(7.54)	6.57
8. Vast Areas and Enormous Vistas	7.12	<u>6.41</u>	8.38*	(8.57)*
9. Rugged Topography	6.33	<u>4.75</u>	7.07	(7.86)*
10. Native Wild Animals	8.66*	<u>7.48*</u>	(9.44)*	9.42*
11. Unchanged Natural Coastlines	7.12	<u>6.73</u>	(9.51)*	9.15*
MEAN	7.53	<u>6.60</u>	8.46*	(8.51)*
		7.09		8.49*

Group 3 -- Physical Vigour

The results of this group indicate that there were no differences in means between the social units; users and non-users seemed to have similar attitudes toward items pertaining to physical vigour (Table 19). The fact that students scored lowest in 'Getting Physically Tired' may indicate that they have more exciting ways of exerting energy than in a forested environment.

Members scored lowest in item 7 (Chance to Acquire Knowledge). This possibly indicates that members, who use forests repeatedly, show diminishing excitement toward additional knowledge of the forest.

Group 4 -- Awareness of Beauty

The responses to Items 1 to 14 (Table 20) indicate that Arboretum users are more perceptive of the outdoor environment than non-users. Statistically, Arboretum users scored higher on 8 of the 14 items tested. Arboretum users also scored higher on the Attitude Tendency Score on all items except 'Picking Flowers' where it appears that users much prefer to appreciate the flowers in their natural surroundings.

TABLE 19
Physical Vigour

Items	Attitude Tendency Score			
	Teachers	Students	Non-Member	Member
1. Physical Exercise	8.66*	<u>7.81</u>	9.44	(9.58)*
2. Emotional Satisfaction	(9.44)*	<u>7.48</u>	8.61*	8.59*
3. Mountain Climbing	<u>4.55</u>	(7.86)	5.12	5.92
4. Breathing Fresh Air	(10.00)*	9.62*	<u>9.51*</u>	9.69*
5. Getting Physically Tired	6.67	<u>5.23</u>	7.20	(8.75)*
6. Learn to Lead Simple Life	7.00	(7.02)	6.50	<u>6.38</u>
7. Chance to Acquire Knowledge	8.26*	8.54*	(9.25)*	<u>7.02</u>
8. Adventure	6.92	(7.25)	5.33	<u>5.00</u>
9. Improve Physical Health	8.75*	(9.33)*	9.16*	<u>8.22*</u>
10. Recapture Pioneer Spirit	3.80	3.71	(4.75)	<u>2.50</u>
11. Relieve Tension	(8.99)*	<u>8.63*</u>	8.67*	8.72*
12. Attain New Perspectives	8.26*	7.52	(8.54)*	<u>5.96</u>
MEAN	7.62	7.49	(7.63)	<u>7.20</u>
		7.56		7.40

TABLE 20

Awareness of Beauty

Items	Attitude Tendency Score			
	Teachers	Students	Non-Member	Member
1. Awareness of Beauty	9.64*	<u>8.65</u>	(9.76)*	8.89*
2. Alpine Meadows	7.61	<u>6.32</u>	7.95*	(8.70)*
3. Absence of Manmade Features	6.64	<u>5.96</u>	7.80	(9.17)*
4. Virgin Forest	<u>7.07</u>	7.55	8.00*	(8.36)*
5. Natural Lakes	9.29*	<u>9.14*</u>	9.27*	(9.77)*
6. Timberline Vegetation	6.33	<u>5.20</u>	(7.54)	6.57
7. Vast Areas & Enormous Vistas	7.12	<u>6.41</u>	8.38*	(8.57)*
8. Rugged Topography	6.33	<u>4.75</u>	7.07	(7.86)*
9. Looking at Scenery	(9.73)*	<u>8.25</u>	9.02*	9.30*
10. Unchanged Natural Coastlines	7.12	<u>6.73</u>	(9.51)*	9.15
11. Waterfalls & Rapids	<u>7.66</u>	7.79	(9.27)*	9.17
12. Picking Flowers	(2.82)	1.46	<u>-1.54</u>	-0.98
13. Taking Pictures	6.31	<u>5.20</u>	(9.18)*	6.04
14. Mountain Climbing	<u>3.45</u>	3.59	5.12	(5.92)
MEAN	6.95	<u>6.20</u>	(7.60)	(7.60)
		6.59		7.60

Group 5 -- Enjoyment of Unspoiled Nature

Most respondents scored highly on this group of Items (Table 21). Even though Arboretum users scored slightly higher than non-users the mean was not significant.

The scores suggest that Arboretum users are not keen on backpack camping, sleeping outdoors, and mountain climbing. They also indicate that Arboretum users are more in favour of hiking than any other single activity. Hiking (referred to as walking in Table 7) is Morgan Arboretum's main activity.

TABLE 21

Enjoyment of Unspoiled Nature

Items	Attitude Tendency Score			
	Teachers	Students	Non-Member	Member
1. Backpack Camping	5.38	(7.21)	6.00	<u>4.43</u>
2. Sleeping Outdoors	5.23	6.63	(6.88)	<u>3.77</u>
3. Hiking	8.07*	<u>4.90</u>	8.78*	(9.24)*
4. Enjoyment of Nature	9.29*	<u>9.03*</u>	9.52	(9.81)*
5. Awareness of Beauty	9.64*	<u>8.65*</u>	(9.76)*	8.89*
6. Drinking Mountain Water	<u>6.02</u>	6.92	6.85	(7.32)
7. Looking at Scenery	(9.73)*	<u>8.25*</u>	9.02*	9.30*
8. Waterfalls & Rapids	<u>7.66</u>	7.79*	(9.27)*	9.17*
9. Canoeing	(7.73)*	<u>5.48</u>	6.46	6.84
10. Mountain Climbing	<u>3.45</u>	3.59	5.12	(5.92)
	<u>7.22</u>	6.85	(7.55)	7.43
	7.04		7.58	

Group 6 -- Miscellaneous

The three items in this group are not related in any

way and hence were treated separately (Table 22). Non-members of the Arboretum scored significantly higher on 'Low Cost Outdoor Recreation'. This may indicate why they use Morgan Arboretum but prefer to remain non-members.

The student group scored considerably lower than the other three social units on 'Family Solidarity'. This indicates why older teens and young unmarried adults do not come to the Arboretum to any great extent.

TABLE 22

Miscellaneous

Items	Attitude Tendency Score			
	Teachers	Students	Non-Member	Member
1. Low Cost Outdoor Recreation	7.52	<u>6.38</u>	(9.17)*	6.46
2. Family Solidarity	(7.41)	<u>3.09</u>	7.03	6.67
3. Chance for Noble Thoughts	<u>3.15</u>	3.59	3.50	(5.00)
MEAN		Not Applicable		

Group 7 -- Social Interaction

Arboretum users scored lower than non-users in this group (Table 23). In looking at the scores for Item 2, Talking With Tourists, one might too hastily conclude that Arboretum users are anti-social, but these results merely

indicate a desire by the users to seek a temporary escape from the human interaction of everyday society. This bears out Green's theory (1964) as explained in the Review of Literature (P.4). The fact that many users visit as a family or friendship group (Table 22) suggests that users wish to have their social intercourse limited to relatives and friends when in the Arboretum. (Fig. 9 demonstrates that with the exception of winter, the larger the visiting group the more time is spent in the Arboretum.)

TABLE 23

Social Interaction

Items	Attitude Tendency Score			
	Teachers	Students	Non-Member	Member
1. Hearing Naturalist Talks	(4.77)	<u>0.97*</u>	2.56	3.93
2. Talking with Tourists	(4.50)	2.02	1.22	<u>-0.41</u>
3. Viewing Naturalist Exhibits	(5.91)	3.71	<u>2.33</u>	3.84
4. Studying Pioneer History	(4.73)	3.45	<u>2.60</u>	2.59
		4.10		2.59

Group 8 -- The Products of Human Workmanship

Users scored lower than non-users in ten of the fourteen items pertaining to man-made improvements which

lead to more developed surroundings (Table 24). There is no way of knowing whether or not Arboretum users do, in fact, enjoy the comforts of modern technology in their own homes, but because of their high income (Table 2), it can be assumed that users do have many of the improvements associated with a modern society. And yet they obviously reject the presence of such facilities in an outdoor environment.

Group 9 -- Modesty

The purpose of this group of items was to evaluate the degree of modesty possessed by each of the four social units. The results show that users are more modest than non-users (Table 25).

Summary

The purpose of this attitude test was to uncover similarities or differences between attitudes of users and non-users toward an outdoor forested environment. The cumulative Attitude Tendency Score in Table 26 indicates the strength to which respondents favoured certain items which relate to an outdoor forested environment. Users scored higher than non-users in groups 1, 2, 4, 5 (group 3 was even) which refer to items concerned with a natural rustic environment. Non-users scored higher than users in groups 6, 7, 8, 9, which involve contact between people, technological improvements and self-importance.

The test therefore showed that Arboretum users have purist tendencies when compared with non-users. The same conclusion was arrived at in the previous attitude test (see User's Attitude Toward Morgan Arboretum, Factor 3 -- Purist Symbols), that Arboretum users are not wholly purists.

TABLE 24

The Products of Human Workmanship

Item	Attitude Tendency Score			
	Teachers	Students	Non-Member	Member
1. Cutting Christmas Trees	<u>-5.95</u>	(-2.45)	-3.41	-3.33
2. Camps for Organization	(2.16)	2.04	<u>-1.46</u>	-0.93
3. Private Cottages	2.41	(4.08)	<u>-1.46</u>	-0.48
4. Purchasing Souvenirs	-5.36	(1.06)	<u>-8.54</u>	-7.14
5. Snowmobiling	-6.88	(-3.33)	-9.27	<u>-10.00</u>
6. Camping with Car	(2.77)	<u>0.67</u>	2.68	0.91
7. Equipped Bathing Beaches	(5.23)	4.13	3.41	<u>2.86</u>
8. Automobile Touring	(2.50)*	0.58	<u>-0.73</u>	1.90
9. Powerboating	-3.01	(0.09)*	<u>-7.56</u>	-6.05
10. Campsites With Plumbing	(5.18)*	3.30	2.44	<u>2.20</u>
11. Developed Resort Facilities	(2.07)	1.63	<u>-3.17</u>	-1.43
12. Manmade Reservoirs	<u>0.91</u>	1.65	(3.27)	2.04
13. Campsites & Outhouse	(4.46)	4.12	2.25	<u>1.09</u>
14. Viewing Naturalists Exhibits	(5.91)	3.71	<u>2.33</u>	5.42
MEAN	0.85	1.59	-0.36	<u>-0.65</u>
		1.21		-0.16

TABLE 25

Modesty

Item	Attitude Tendency Score			
	Teachers	Students	Non-Member	Member
1. Chance to Stumble into Wealth	2.45	(3.98)	0.37	<u>0.22</u>
2. Sense of Personal Importance	3.67	(6.79)	1.75	<u>0.41</u>
3. Chance to Boast	<u>-6.36</u>	-5.00	(-3.75)	-5.78
4. Sense of Humility	4.17	<u>0.00</u>	(5.78)	2.67
MEAN	1.00	1.46	(0.78)	<u>-0.59</u>
	1.23		-0.07	

TABLE 26

Groups and Attitude Tendency Score

Groups of Items	Attitude Tendency Score (Average Obtained by all Respondents)	Social Unit which scored higher	
		Users vs. Non-Users	
1. Rustification (Seclusion)	8.03	+	
2. Naturalism	7.97	+	
3. Physical Vigour	7.46		even
4. Awareness of Beauty	7.22	+	
5. Enjoyment of Unspoiled Nature	6.48	+	
6. Miscellaneous Items	5.87		+
7. Social Interaction	3.17		+
8. Products of Human Workmanship	0.59		+
9. Modesty	0.42		+

+ indicates which social unit Scored higher.

User's Reaction to Current Government Recreational Laws

Hunting, fishing, and snowmobiling are increasing. More money is being spent today than ever before on high powered rifles, guns, snowmobiles, and other equipment associated with these sports (Campbell, et al., 1968). On the one hand, there are conservation groups lobbying for the outlawing of hunting, fishing, and snowmobiling. On the other hand, there are those who feel that there should be open season on all fish, game and wildlife resources.

Users and non-users were asked to express their attitudes toward current government recreational laws. All groups felt that hunting and snowmobiling should be more rigidly controlled but that existing rules for fishing are adequate (Table 27). The results indicate real concern for the deteriorating environment and an apparent knowledge of ecological principles. But if respondents were aware of the actual conditions existing in our lakes and streams and the ecological principles which govern animal life, then perhaps they would have answered differently, that is, that fishing laws should be re-evaluated and hunting restrictions should be eased.

TABLE 27

Reaction to Current Government Recreational Laws

		Should Have open Season		Present Rules Are Fine		More Rigidly Controlled		Should be Outlawed		No Opinion	
		No	%	No.	%	No.	%	No.	%	No.	%
Big Game Hunting	Arb. Users	4	1.4	46	11.7	182	46.3	128	32.5	34	8.6
	Teachers	0	0.0	28	12.6	100	45.0	70	31.3	24	10.8
	Students	6	2.7	28	13.2	76	35.8	84	39.6	18	8.5
<hr/>											
Water-fowl Hunting	Arb. Users	4	1.3	70	18.0	167	42.8	104	26.7	45	11.6
	Teachers	0	0.0	42	19.1	80	36.2	64	29.0	34	15.4
	Students	10	4.7	38	17.9	70	33.0	62	29.3	32	15.1
<hr/>											
Fishing	Arb. Users	11	2.9	177	45.8	149	38.6	14	3.6	35	9.0
	Teachers	4	1.8	102	46.8	82	37.6	12	5.5	18	8.2
	Students	0	0.0	74	41.0	64	35.3	18	10.0	24	13.3
<hr/>											
Snowmobiling	Arb. Users	0	0.0	6	1.5	255	64.0	32	33.2	5	1.3
	Teachers	2	0.9	8	3.8	158	67.5	60	26.5	6	2.8
	Students	32	13.8	26	11.2	124	53.5	38	16.4	12	5.2

CONCLUSIONS

Morgan Arboretum is a relatively small natural suburban forested outdoor environment. It offers few non-forest oriented activities for the recreationist. There has been a steady increase in the number of visiting groups since its founding. An effort was made to determine the behavioural patterns of its users by examining such factors as group make-up, aesthetics, activities and their relations. In examining behavioural patterns it became necessary to examine some of the attitudes of users toward outdoor recreation in general and Morgan Arboretum in particular. In addition to the year-round, on-the-spot observation of the users, various kinds of written and oral questionnaires were given to members and non-members. The study of the combination of the factors of behaviour and attitudes gives us some insight into why people come to Morgan Arboretum and why it has been a successful experiment of multiple land use.

In general, there were no significant differences in either attitudes or behaviour between members and non-members. Also, both groups had similar educational backgrounds and occupations. Because of this, all users, members and non-members, were used as a single group when compared to non-users.

The Arboretum is a relatively small area, yet when

looking at the total annual picture only a fraction of the site is used. Only 8.2% of the total annual recreation hours were spent in the Arboretum during the summer when biting insects are present and ground conditions are not uniform. During the winter when ground conditions are similar throughout the Arboretum there was a much more general usage of property. Therefore it appears that users were not ready to explore new areas because of the less favourable environmental conditions of the other seasons. The lack of general usage therefore coincides with the attitudes expressed by users-- a tendency to purism. If users were truly purists they would use the property to a greater extent even under conditions which are less than ideal.

The Arboretum in its present state appears to satisfy the users. Only forest oriented recreationists (i.e. users) will find Morgan Arboretum suitable. Non-users (e.g. control group and the like) have not been attracted to the area because of the lack of facilities for non-forest activities and the lack of facilities for their comfort.

Summary of Specific Findings

1. In a study of the relationship between rural or urban residence and outdoor recreational participation, the Outdoor Recreation Resources Review Commission (1962) set up four categories of residents: (1) the

cities themselves, (2) the suburban fringe, (3) adjacent areas to a distance of fifty miles, and (4) outlying areas at least fifty miles from a city of 50,000. The study indicated that the suburban areas showed somewhat higher participation in outdoor recreation than cities and other areas. The relatively high participation by suburbanites was found to be a reflection of their income, education, and occupation. Both of the above facts were borne out in the study of Morgan Arboretum. A relatively high number of Arboretum users are highly educated, with above average income (Table 2 and Fig. 1), and live mainly in the suburban areas of Montreal (Table 4).

2. The number of visits made to Morgan Arboretum by all users diminishes with distance travelled from point of origin. This result is similar to findings from other studies involving similar data (Figs. 5 and 6).
3. Sixty-eight percent of the total number of groups using the Arboretum are members (Table 5). Twelve point one percent of the total number of visitors to the Arboretum were turned away because they refused to pay an entrance fee (i.e. non-members fee).
4. The peak hours of use occur between 11:00 A.M. and 3:00 P.M. (Fig. 7).
5. The greater percentage of users remained more than one

hour during spring, fall and winter, but remained much less during the summer (Table 6). This has been attributed to the diminished aesthetic qualities (partially due to the number of insects) together with the lack of non-forest oriented recreation during this season.

6. In Morgan Arboretum, there are fewer number of people per group in winter than in the other seasons of the year (Table 6).
7. Forty point one percent of the annual total recreation time is spent during the spring (i.e. 748,983 hrs.)
8. Although there are more daylight hours available for recreation during the summer, only 8.2% of the total annual recreation time is enjoyed by only 2110 people (9.7% of the total annual users).
9. There is a direct correlation between the average number of people per group and the time spent by each group during spring, summer and fall. However, in winter, with the fewest number of people per group, the time spent is the longest (Figs. 8, 9, and 10).
10. There is a direct correlation between the number of people per group and the aesthetic quality of the Arboretum as evaluated by users (Fig. 11).
11. Although the aesthetic quality of the Arboretum explains the short amount of time spent in the Arboretum by users during the summer it does not explain the long amount of time spent in the winter.

12. The increase in time spent per group in the Arboretum during the winter is NOT related to aesthetics or to aesthetic-activity and therefore must be related to pure activity, that is, winter sports (See "Activities").
13. Hendee (1969), in his studies, categorizes rural people as utilitarian or goal oriented and urban people as activity oriented, that is, concerned with the aesthetic values of outdoor recreation. The study of Morgan Arboretum included only a minimum number of rural people (Table 4), therefore only the second part of Hendee's theory could be tested. However the study of the behaviour of Morgan Arboretum users showed that 75.2% of urban or suburban people do come to the Arboretum for pure aesthetics and aesthetic-activities (Table 7), 'Awareness of Beauty' (Table 20), and 'Enjoyment of Unspoiled Nature' (Table 17), thus correlating attitude and actual behaviour.
14. Four Recreation types emerged based upon distance travelled and time spent in the Arboretum. They are, 'walkers', 'picnickers', 'joggers', and 'skiers' (Fig. 14).
15. A greater general usage of the property occurs during the winter than during the other seasons (Figs 15 and 16). Skiing and snowshoeing (the major winter activities)

are the reasons for this greater usage reinforcing the fact that people stay longer in winter because of the winter activities. The lack of general usage during the other seasons is, once again, partly attributed to the poor environmental conditions on the trails and paths. The "main circuit", Dale Field and the area around Chalet Pruche proved to be the most heavily used areas (Figs 15 and 16).

16. The average distance travelled in the Arboretum during the summer is lower than during the other three seasons (Table 8). It is related to average time spent in summer (Table 6) which is also lower than the other three seasons.
17. Green (1964) maintains that the exodus toward the outdoors is based upon man's desire to reduce temporarily, social contact with others. Users of Morgan Arboretum scored high in the Attitude Tendency Score in such items as 'Tranquility', 'Solitude', and 'Absence of People' (Table 17) and significantly low in 'Talking with Tourists' (Table 23) thus bearing out Green's findings. The same findings can be used to verify Mead's statement (1962) concerning man's desire to get away from it all.
18. The highly favourable attitude toward hiking (Table 21, Item 3) corresponds to the behavioural item that 'Walking for Pleasure' is the major year round recreation in Morgan Arboretum (Table 7).
19. Users of Morgan Arboretum are significantly opposed to

the 'harvesting' of products in the Arboretum such as 'cutting trees' and 'picking flowers' (Table 10, Item 13, Table 20, Item 12, and Table 24, Item 1.) Results concur with Heath's (1964) feeling that to many forest recreationists, forest recreation and economic benefits from the forest are incompatible. However, some users are unaware that forest operations do take place in the Arboretum (see Appendix).

20. Arboretum users scored highest on the Attitude Tendency Score (8.70) in their attitudes to rustic factors associated with any outdoor environment (Table 17). This correlates with the pattern of users' behaviour in the Arboretum where 75.2% are concerned with either pure aesthetics or aesthetic-activity (Table 7).
21. Users of Morgan Arboretum reject man-made improvements (Table 13, and Table 24). However 70% would accept chemical toilets if they were located in one spot.
22. A significant percentage of users feel a sense of responsibility toward the behaviour of other users in the Arboretum, but a lesser percentage (not significant) actually would make an effort to put their feelings into practice.
23. Users do not wish to be annoyed by unleashed dogs (Table 10, Item 9).
24. Trail and trail signs are favoured by Arboretum users (Table 11, Items 16 and 18).

25. There are no differences between the opinions of users and non-users in their reactions to current government recreational laws (Table 27). Both groups feel existing laws for fishing are adequate and laws for hunting and snowmobiling should be more rigidly controlled.

Recommendations

"Walking for pleasure" is Morgan Arboretum's major year-round recreational activity and skiing and snowshoeing are the favourite winter activities. At the same time users wish to retain the rustic features of the Arboretum and oppose the addition of manmade improvements. In view of the above facts, if increased recreational use of the property on a year-round basis is to be one of the goals of the members then members must look at probable causes of certain seasonal diminished use of the property and the ways of overcoming the problems. The following is a list of recommendations which should lead to more efficient and more pleasurable use of the site:

1. Trails should be of two types--long trails for walkers who wish to explore the area in quiet solitude, and short trails for shorter visits. Both trails types should be of the 'loop' variety so that users do not have to retrace their paths. All trails should be sufficiently clear so that no hazards exist for users.
2. Even though attitudes toward "trail signs" and "benches" differed, few signs indicating the direction to the parking lot should be included in any plan for improvement. Such signs could prevent users from getting lost temporarily.
3. Benches which are constructed from natural logs and placed in strategic locations do not detract from a rustic

appearance. This simple convenience would show consideration for Arboretum users who tire easily and would be much appreciated by them.

4. The winter snowfall diminishes the parking area and ultimately results in fewer and perhaps shorter visits. If the parking lot were expanded, many more visitors could be accomodated. Since the number of memberships is increasing every year, this improvement seems necessary.

5. Since the users have indicated that they dislike seeing cut trees, any evidence of forestry operations specifically involving the cutting of trees must not be carried out where recreationists can view these operations.

6. Equestrian paths should be separated from pedestrian paths. Large hoof-holes which fill with water and mud create walking hazards and detract from the beauty of the paths. In addition, pedestrians often resent having to step off paths to make room for horses.

7. Biting insects annoy visitors during the warm season and may be the cause of the sharp decrease in the amount of time spent per visit. Also, use of the site is limited in the summer. It would be useful to investigate methods to rid the Arboretum of these insects. But would spraying with a "safe" insecticide actually increase the usage of Morgan Arboretum during the warm weather? How would the spraying affect the flora and fauna? What would be the

reaction of the public in view of the general outcry favouring the ban of chemicals?

In addition to the specific recommendations above, some general area of research can be suggested in order to discover what people want in an outdoor environment. An unbiased rating of scenic attractiveness perhaps by a team of landscape architects, using objective measurements of elements thought to be scenically important and in-depth interviews to probe reactions to aesthetics, would be valuable in determining reactions to outdoor environments.

The quality of an environment is determined by the number of favourable characteristics possessed by that environment. Any recreation program that ignores quality will be a failure. Therefore a collective effort on the part of ecologists, psychologists, and sociologists is necessary to measure the quality of an environment and thus to anticipate usage.

Implementation of any recommendations should lead directly to increased use of the forest and concurrently to its deterioration. Therefore the carrying capacity of the Arboretum would have to be investigated. At what point would increased use cause a marked deterioration in the property? Questions of this nature should be answered if recreation resource managers hope to do more than catch up with the increasing recreational needs of the population.

FIGURE 1

Group visits to Canadian Parks since 1945

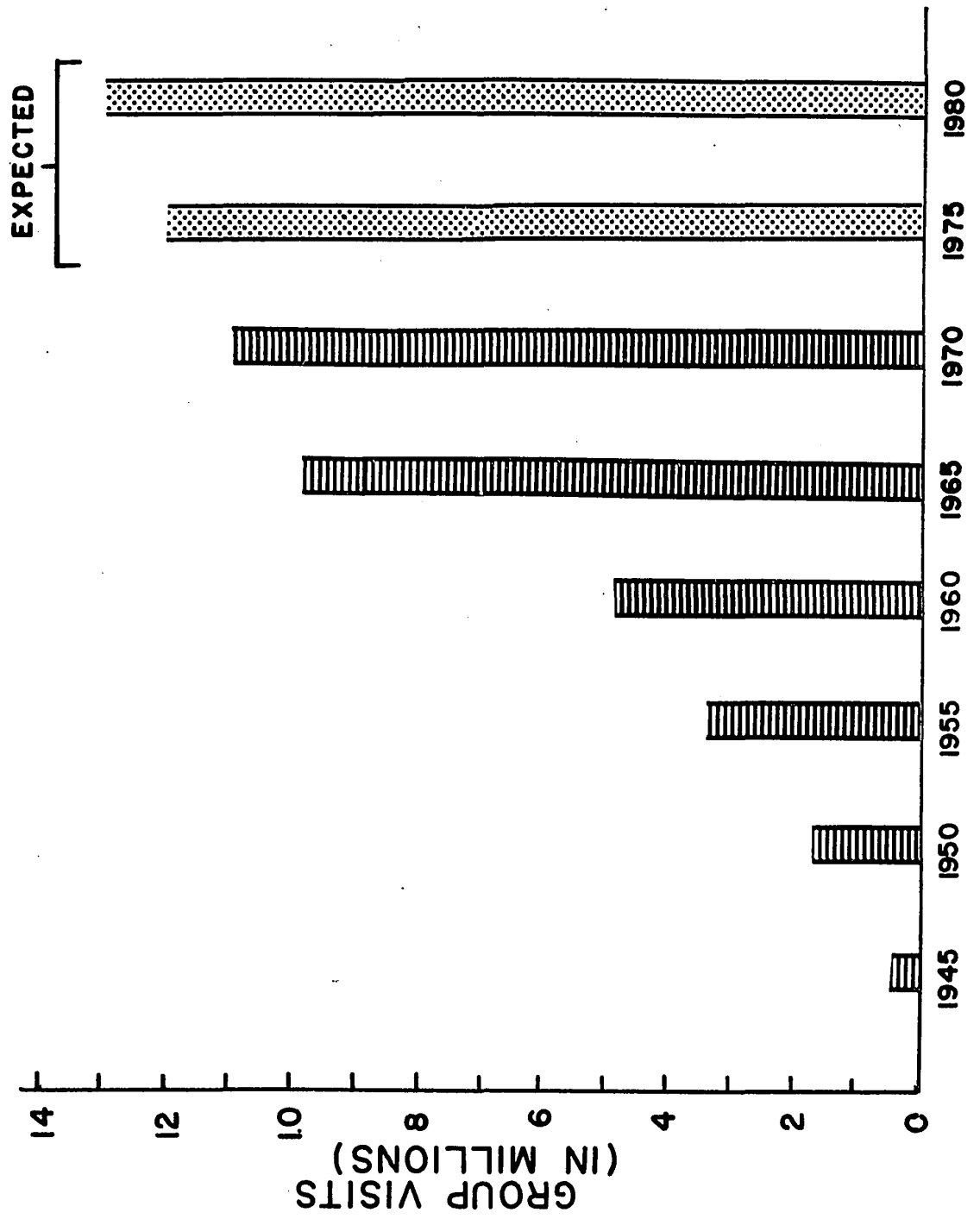


FIGURE 2

Island of Montreal

ISLAND OF MONTREAL

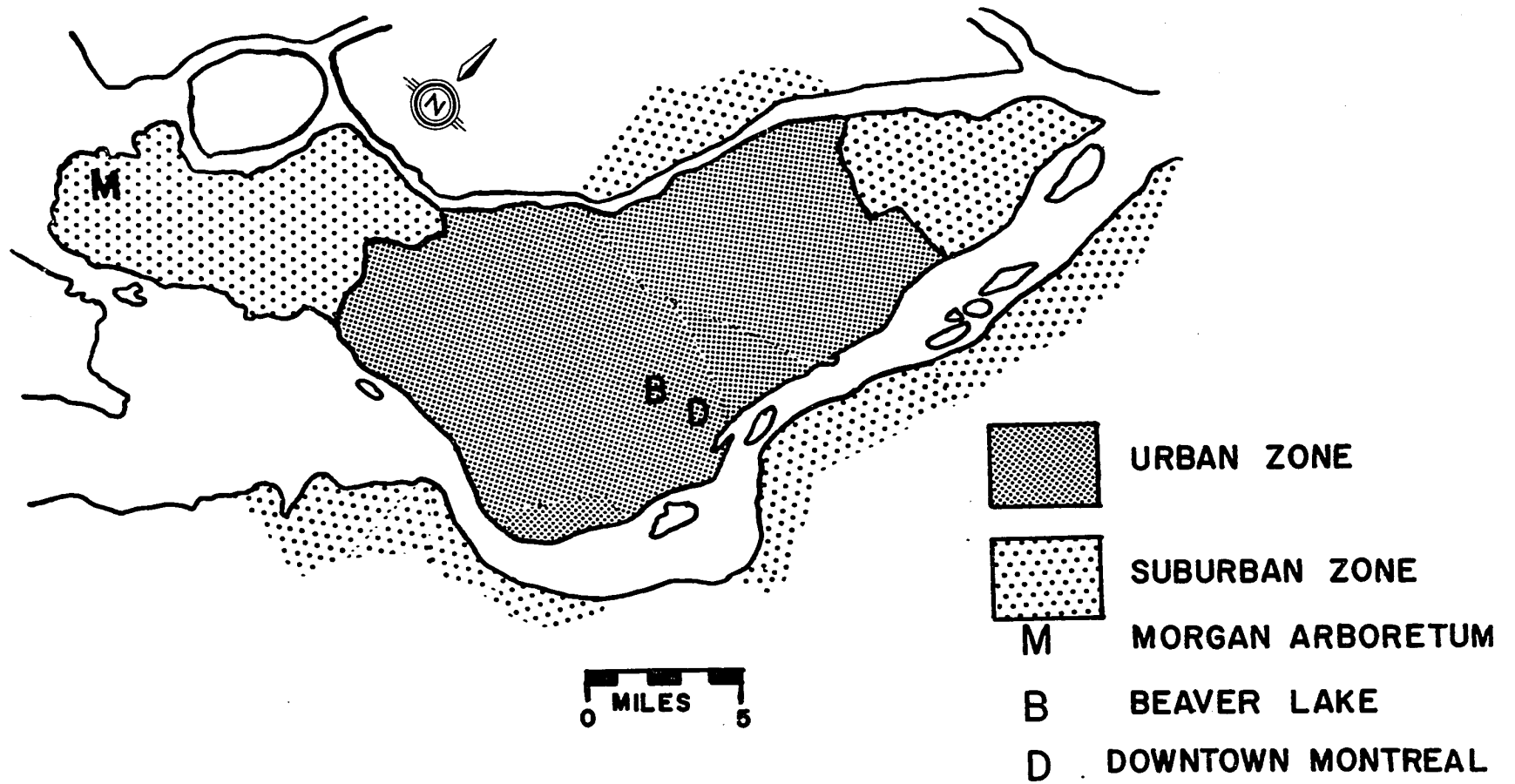


FIGURE 3

Morgan Arboretum
and
Macdonald College

**MORGAN ARBORETUM
AND
MACDONALD COLLEGE**

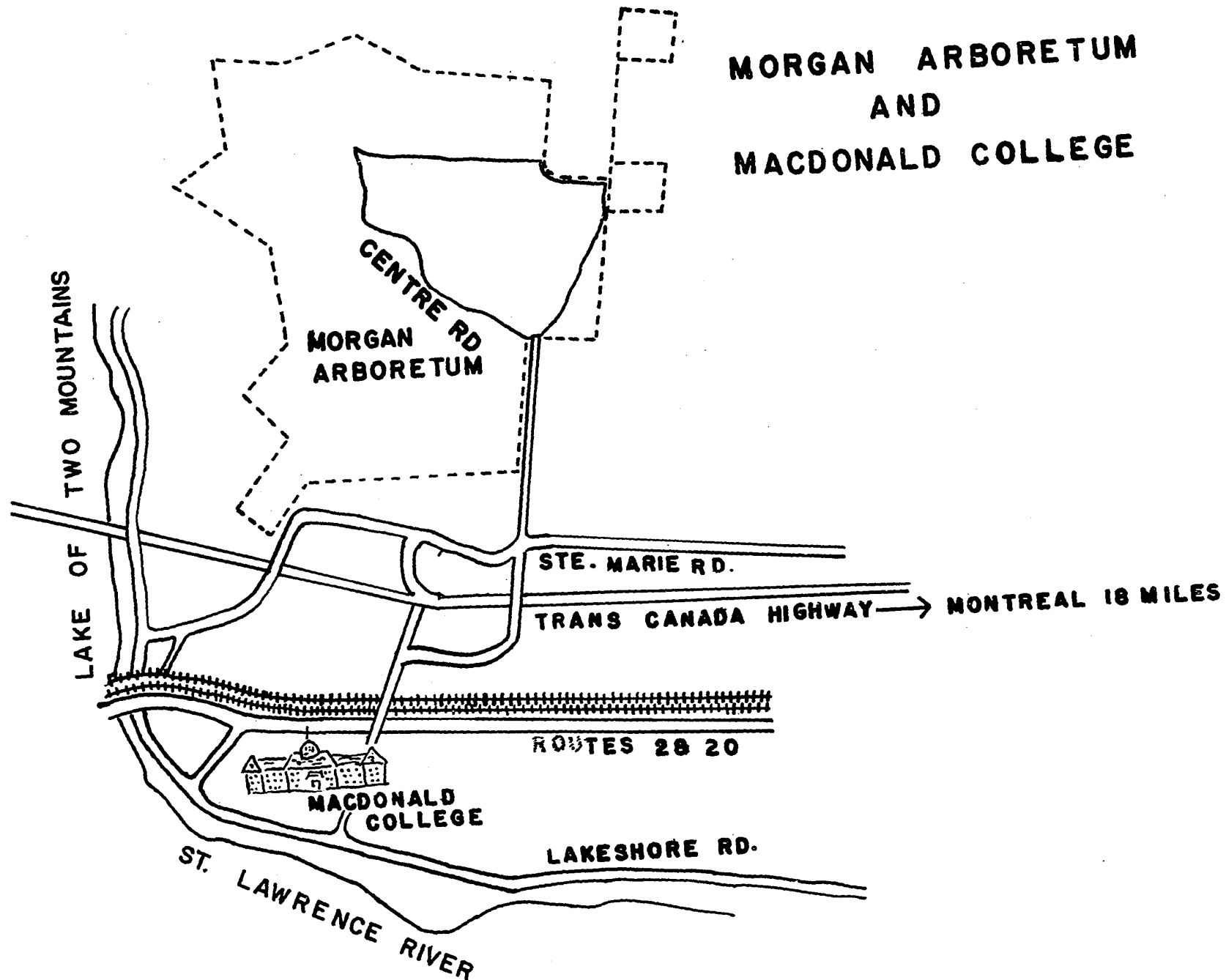


FIGURE 4

Education make-up of Arboretum Users

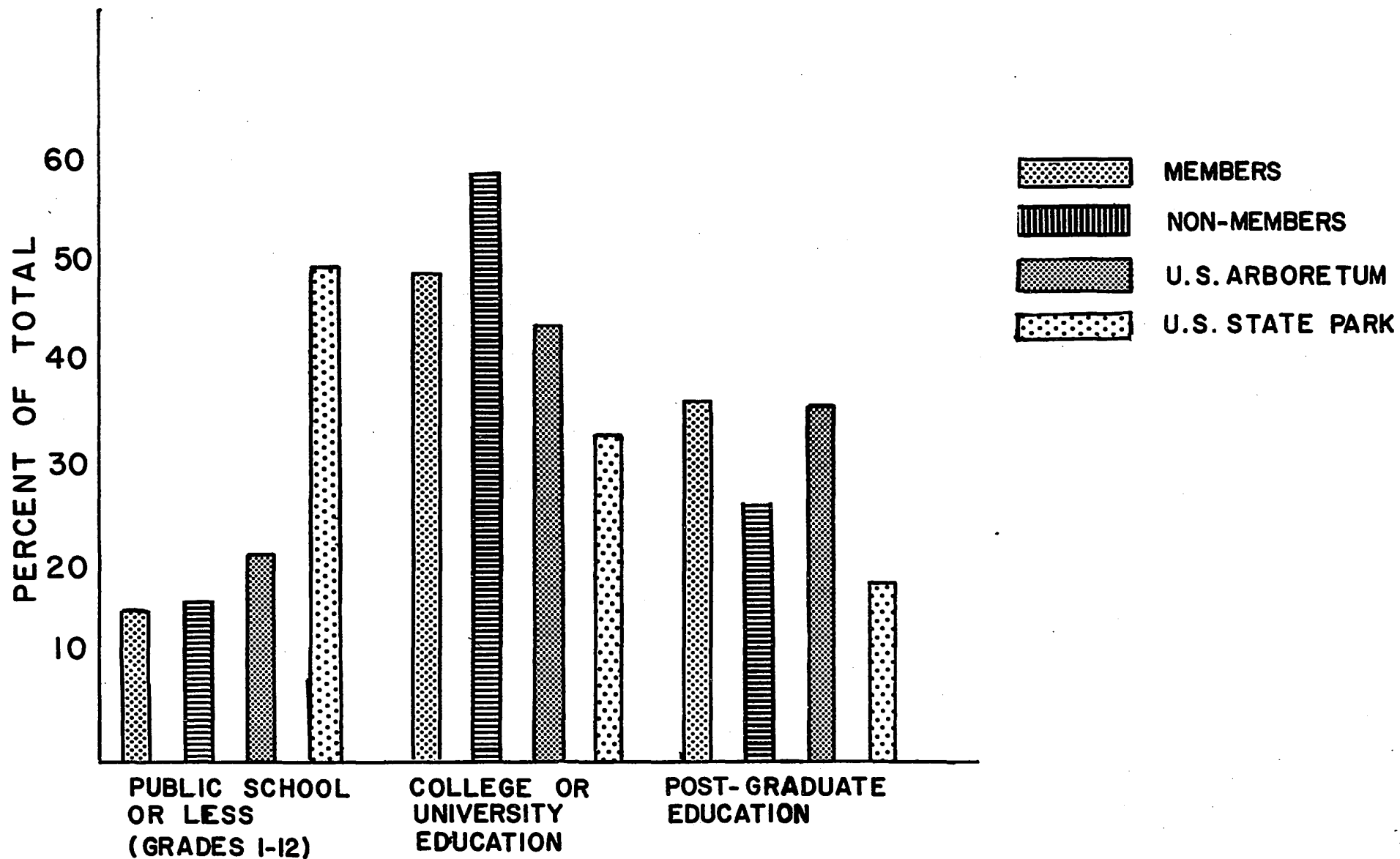


FIGURE 5

Distance travelled from point of origin

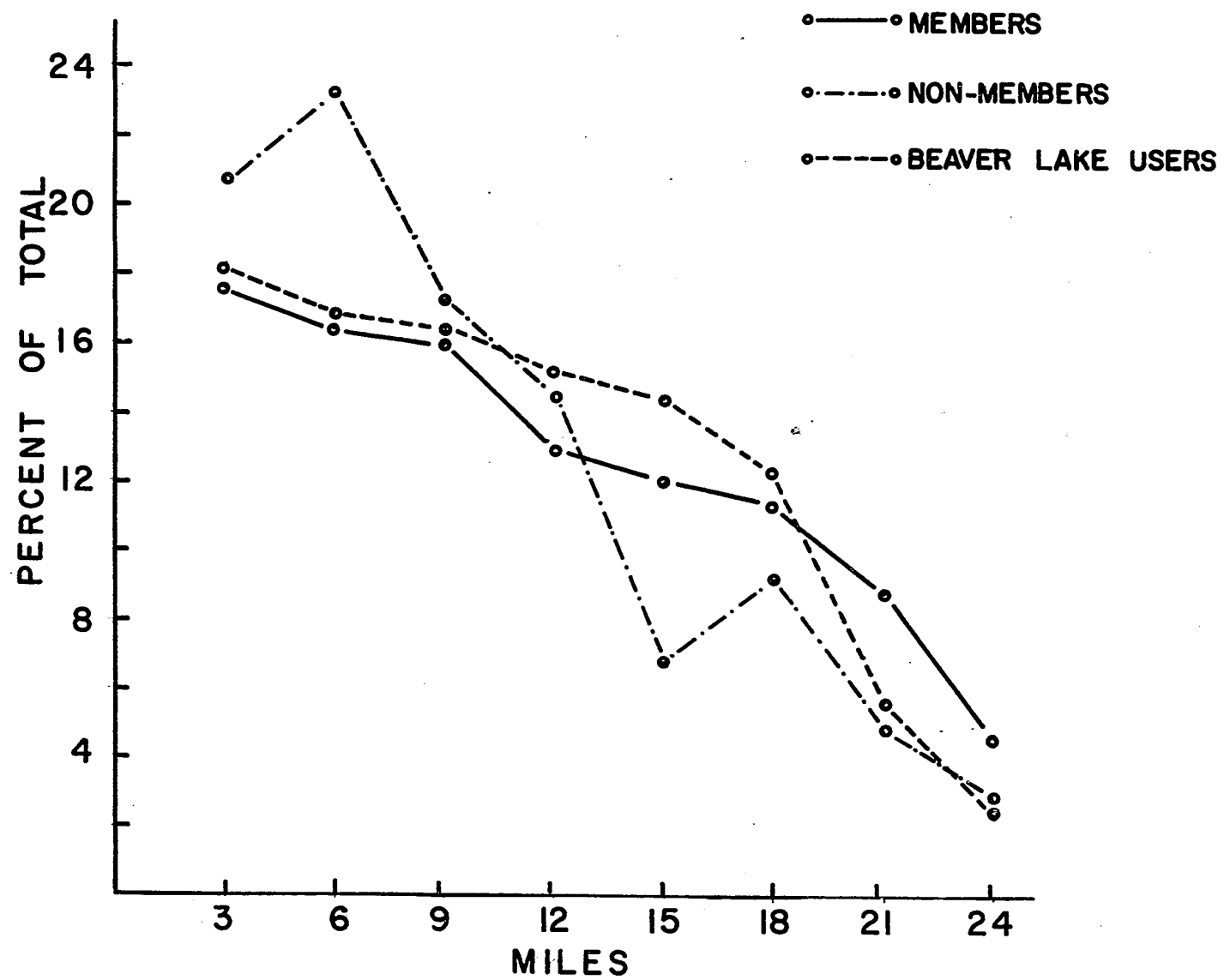


FIGURE 6

Distance Travelled from point of origin

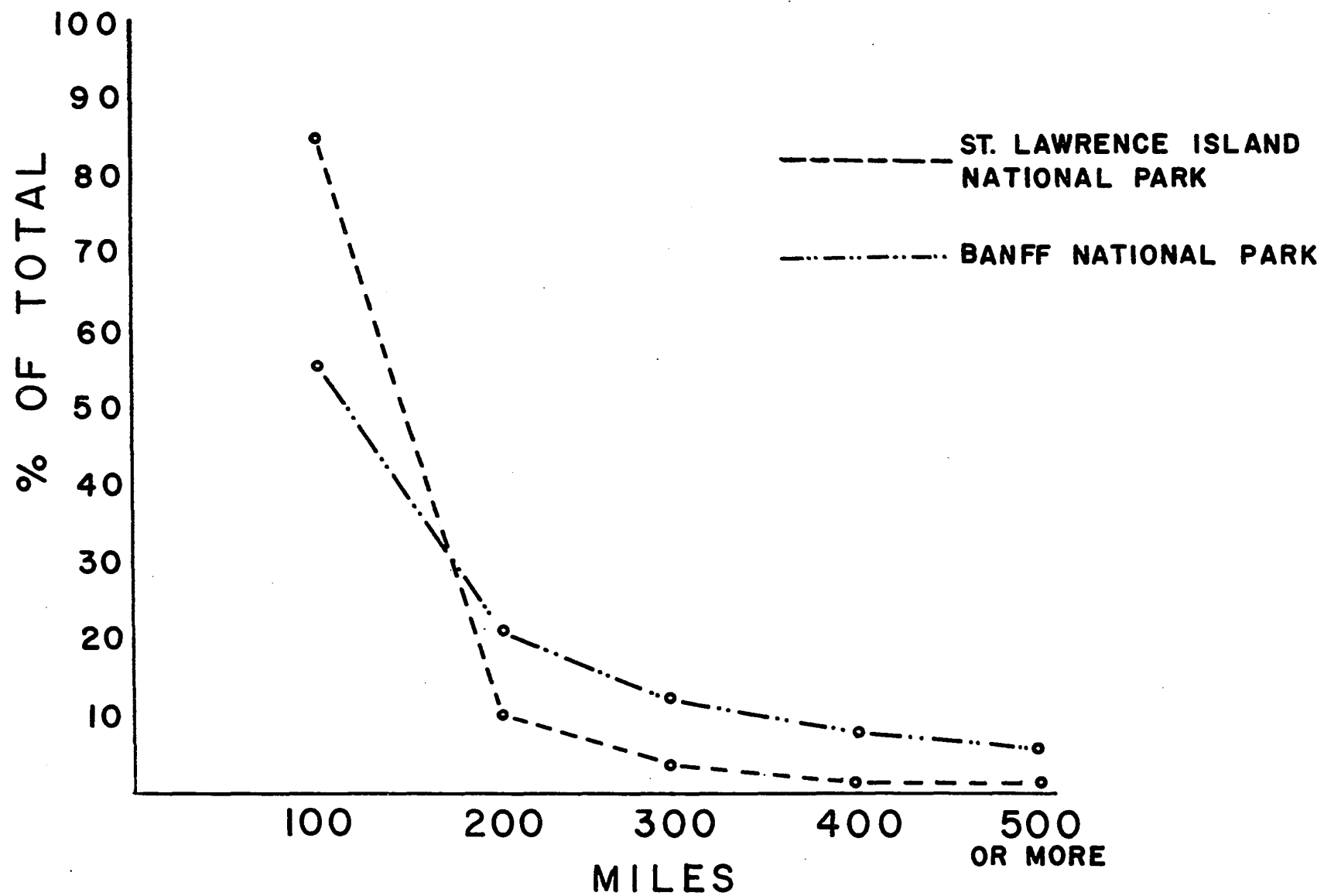


FIGURE 7

Peak periods of use in Morgan Arboretum

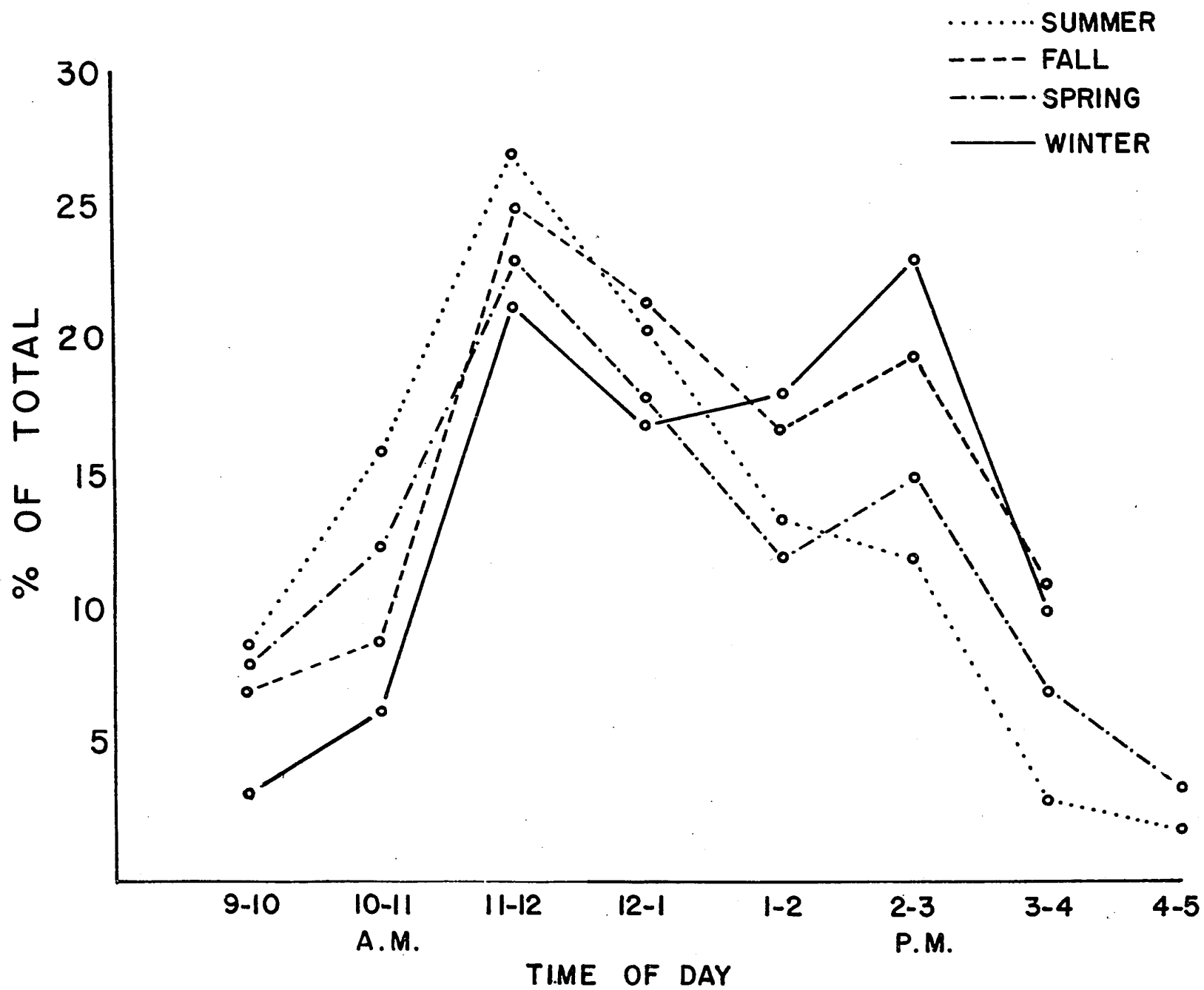


FIGURE 8

Time spent compared with group size

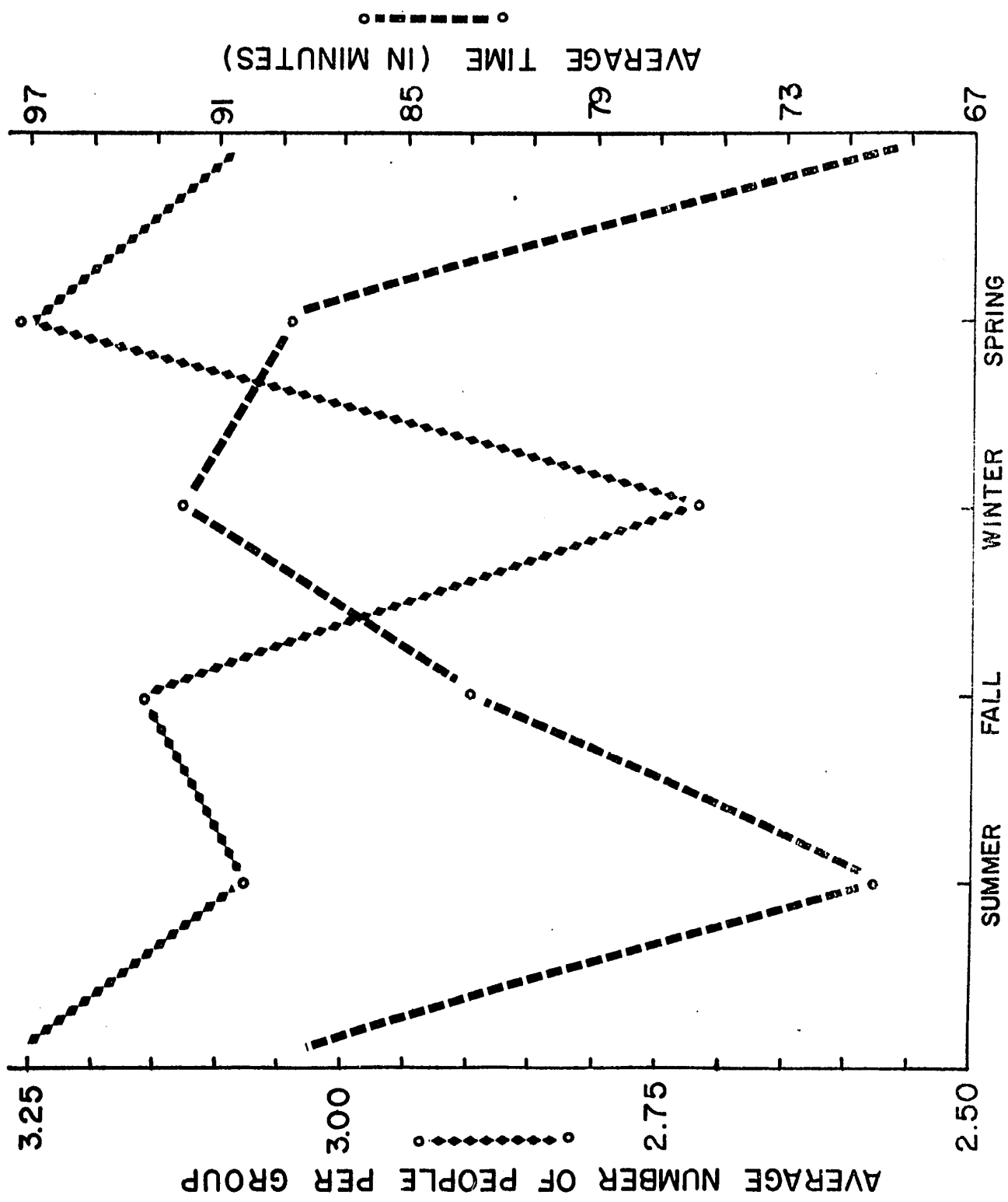


FIGURE 9

Time spent compared with group size during four
days representing the four seasons

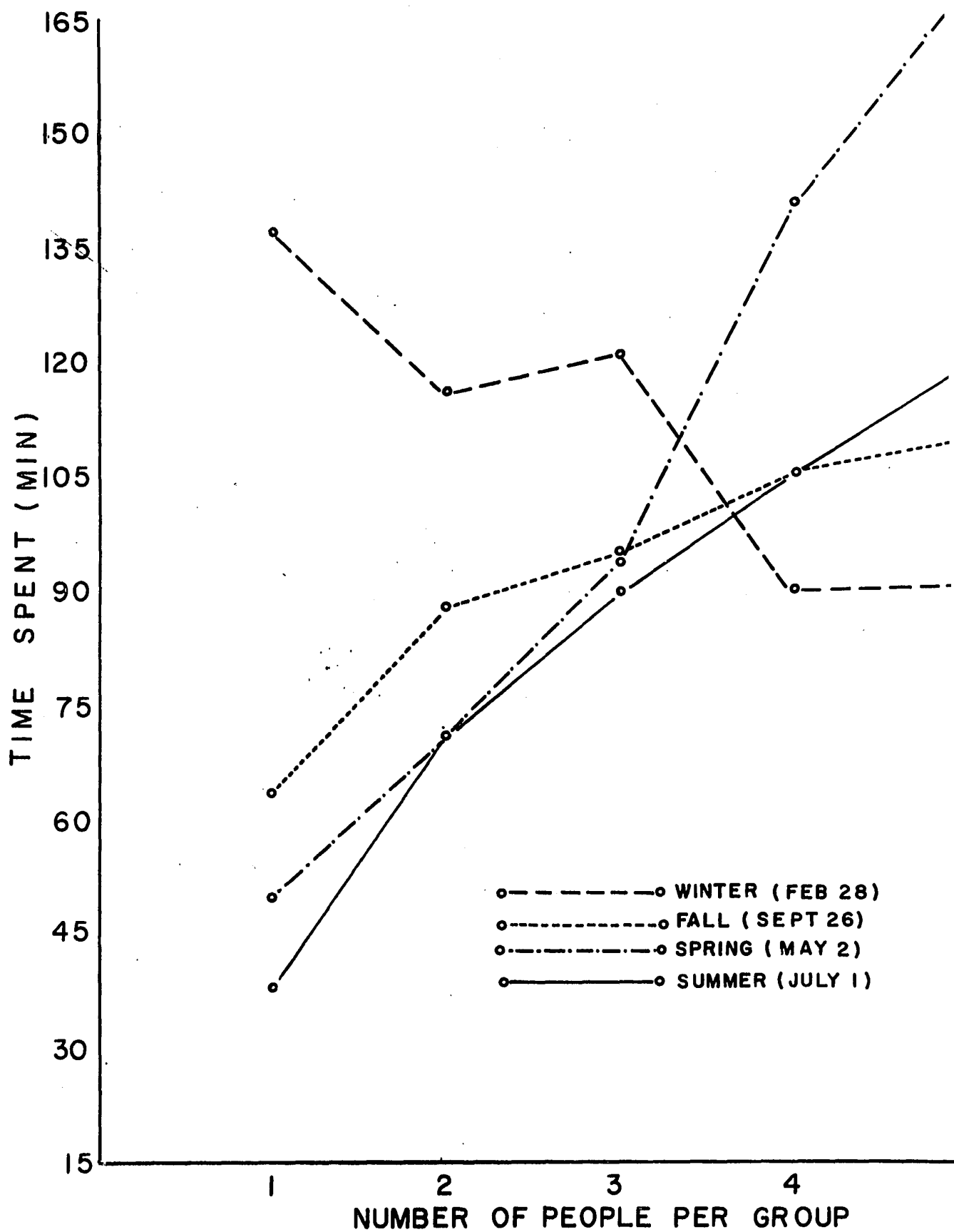


FIGURE 10

Relationship between group size and time spent
during the seasons

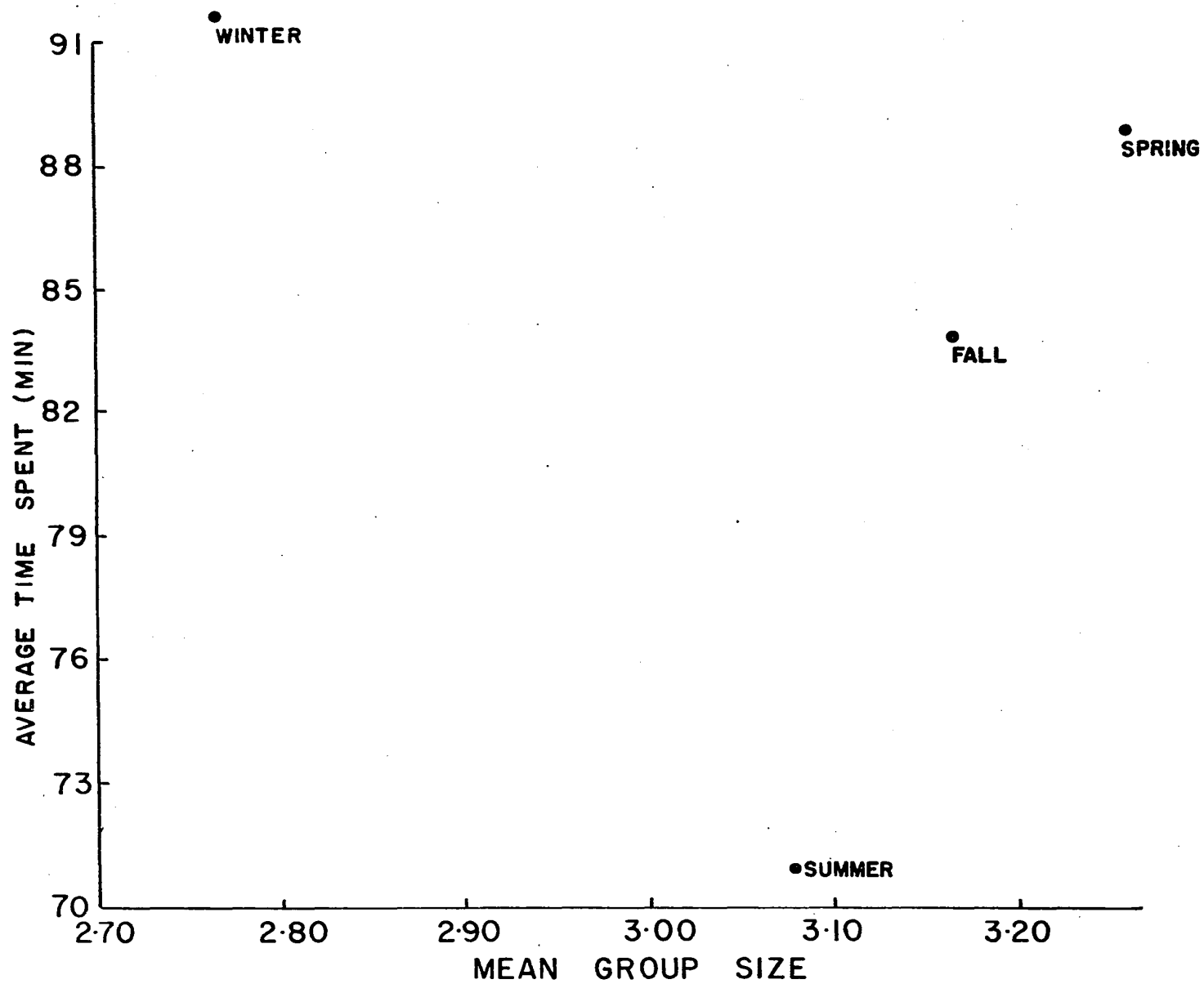


FIGURE 11

Aesthetics compared with number of people
per group.

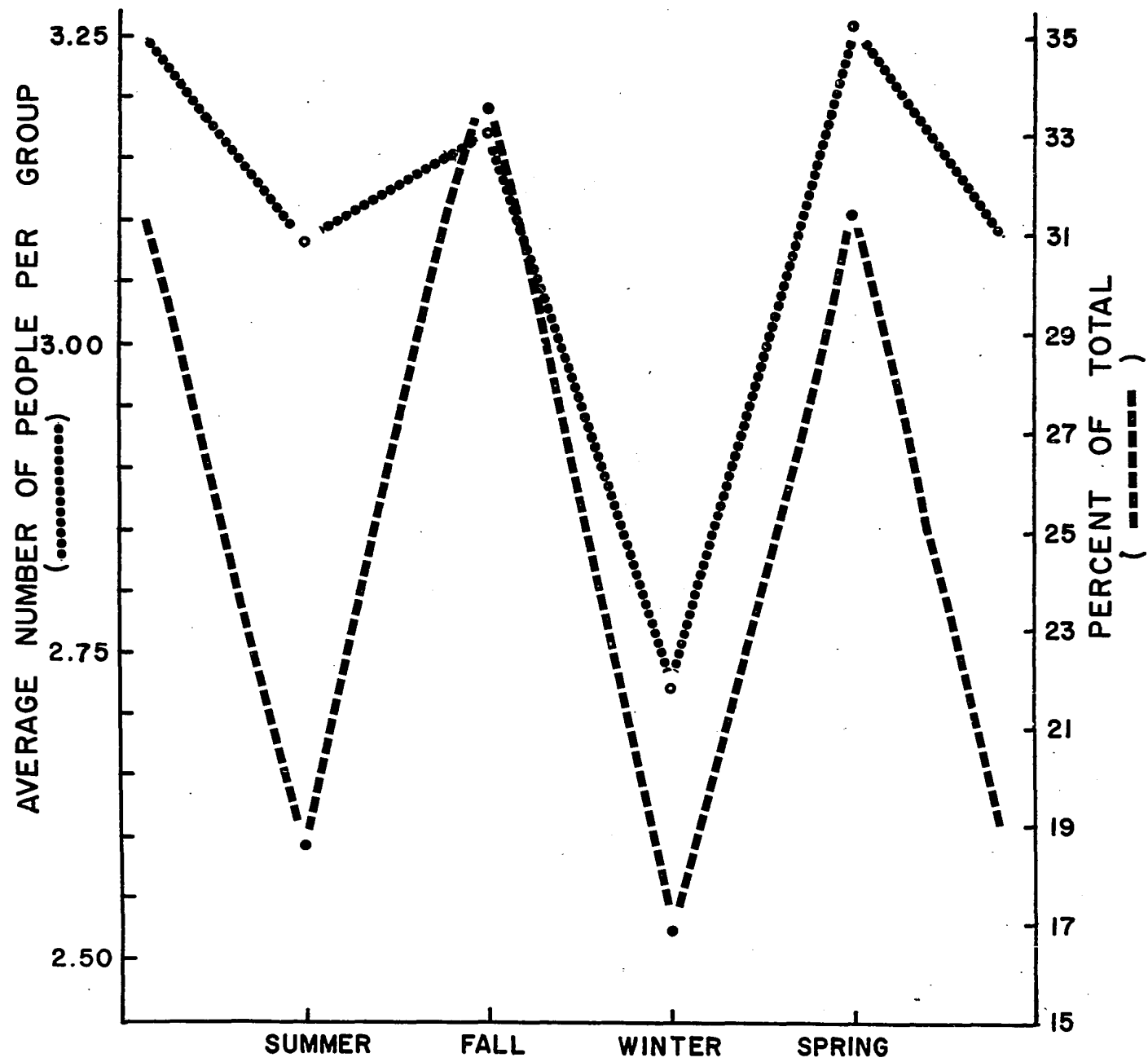


FIGURE 12

Aesthetic appeal of Morgan Arboretum on a
Monthly Basis and during the four seasons

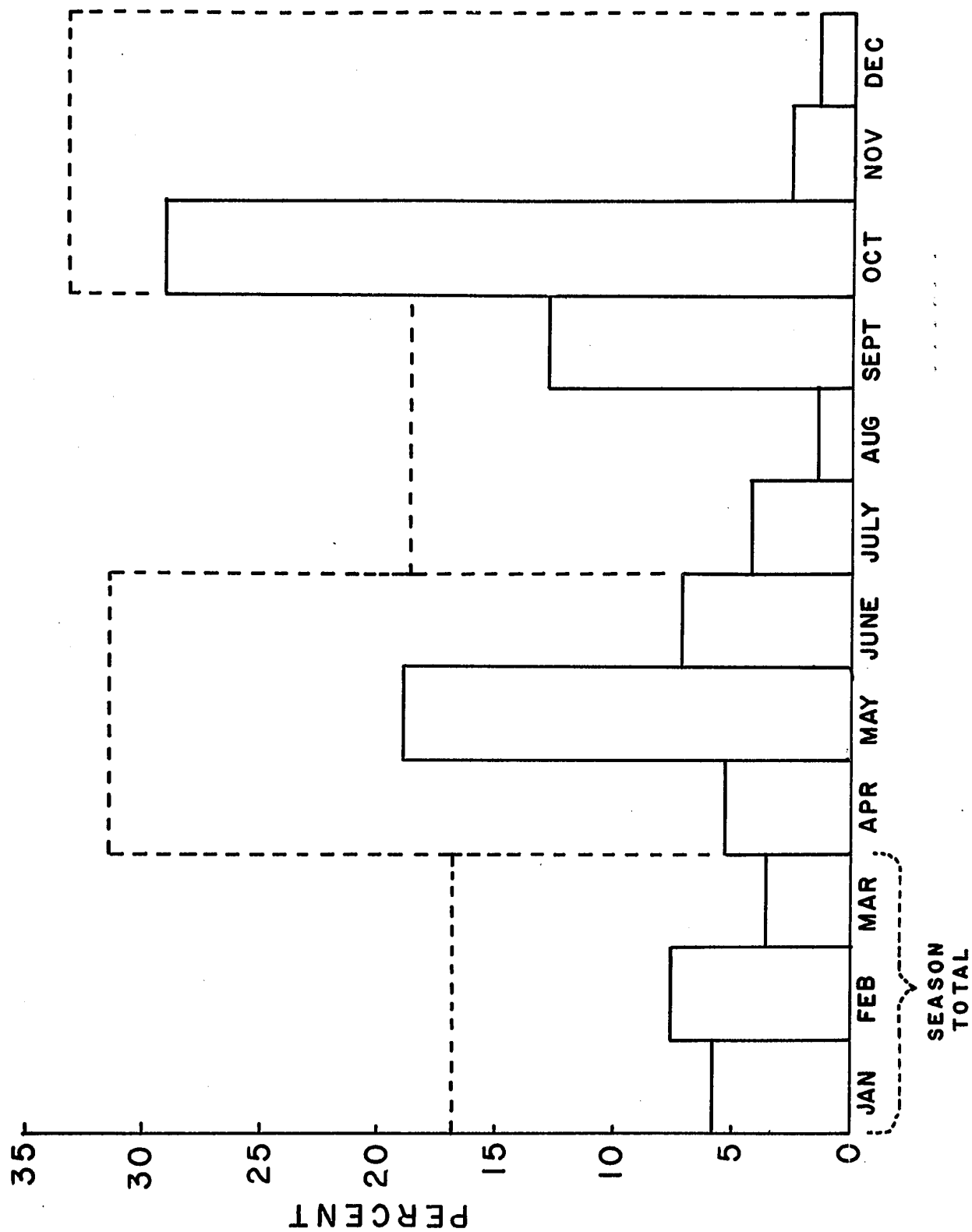


FIGURE 13

Average time spent compared with aesthetics

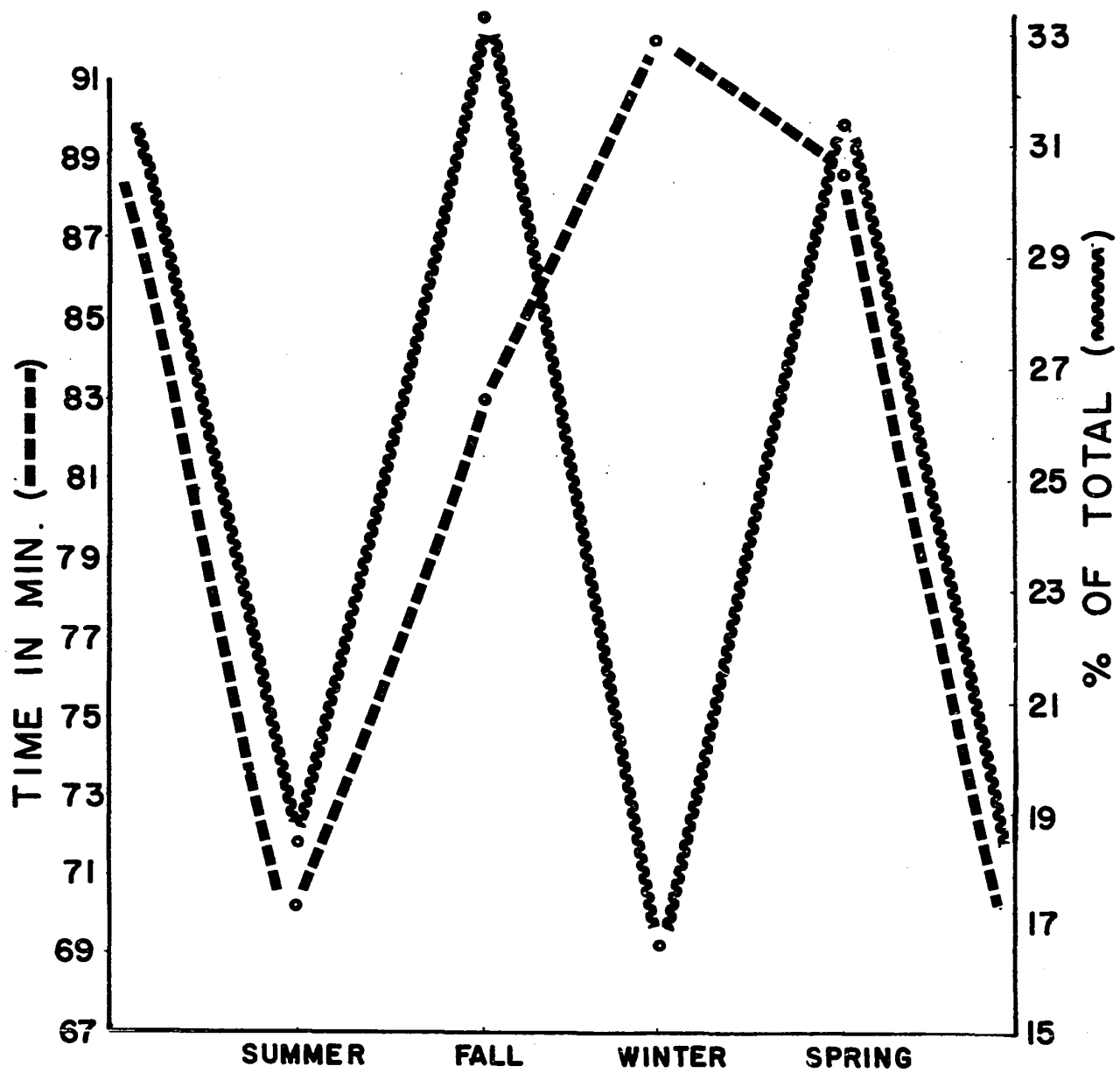


FIGURE 14

Time spent compared with distance travelled

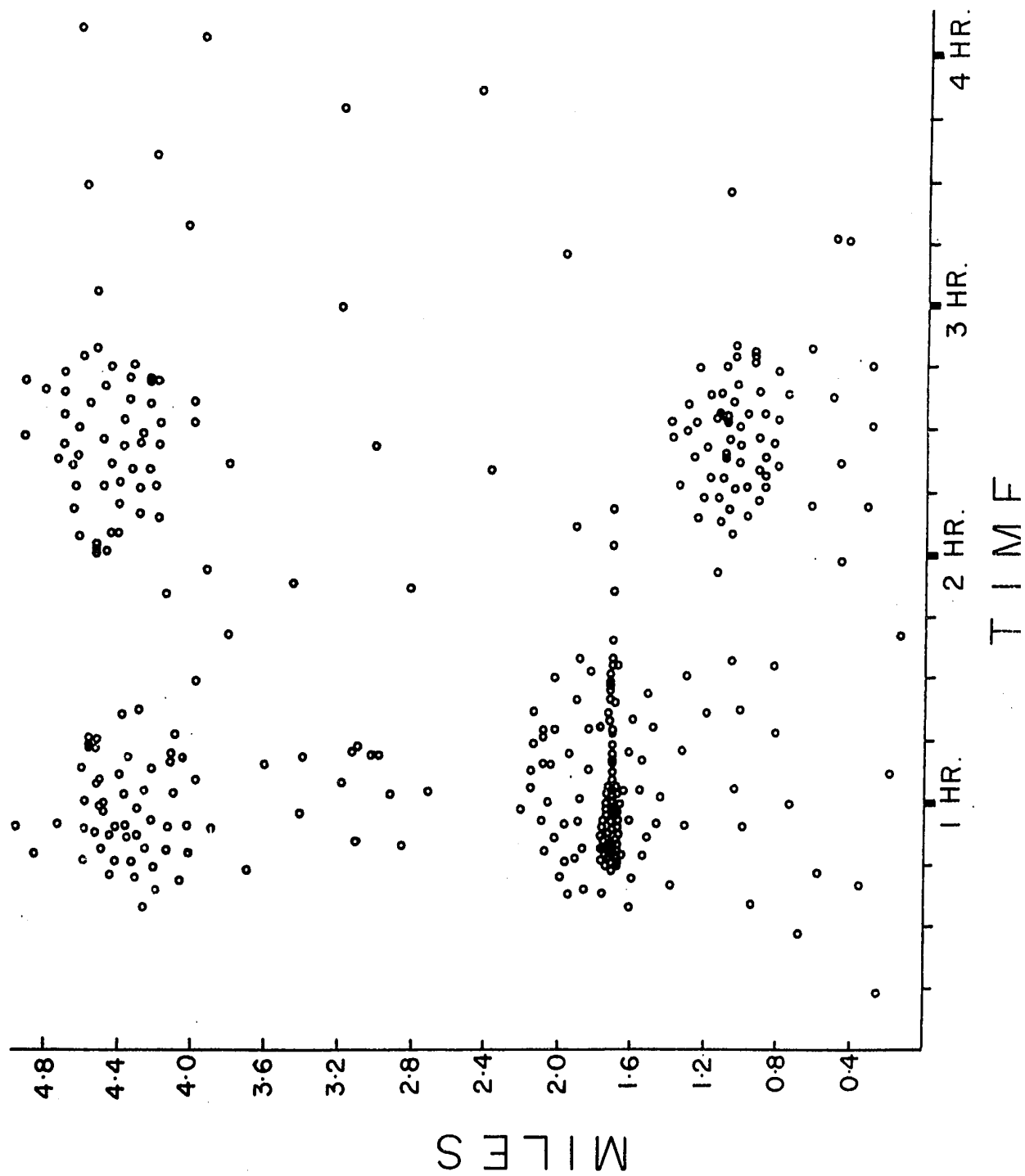


FIGURE 15

Winter trail use in Morgan Arboretum

Winter Trail Use

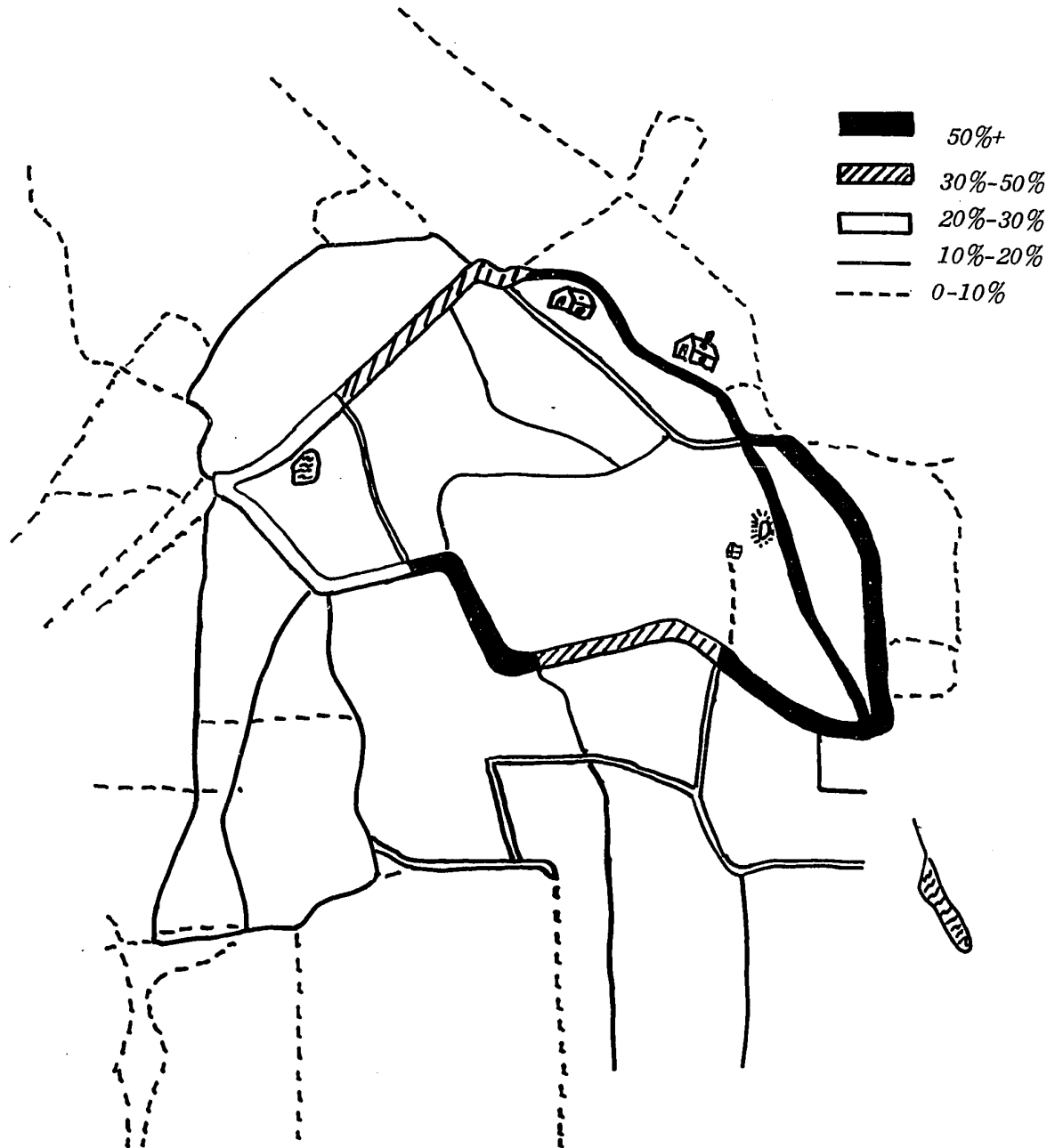
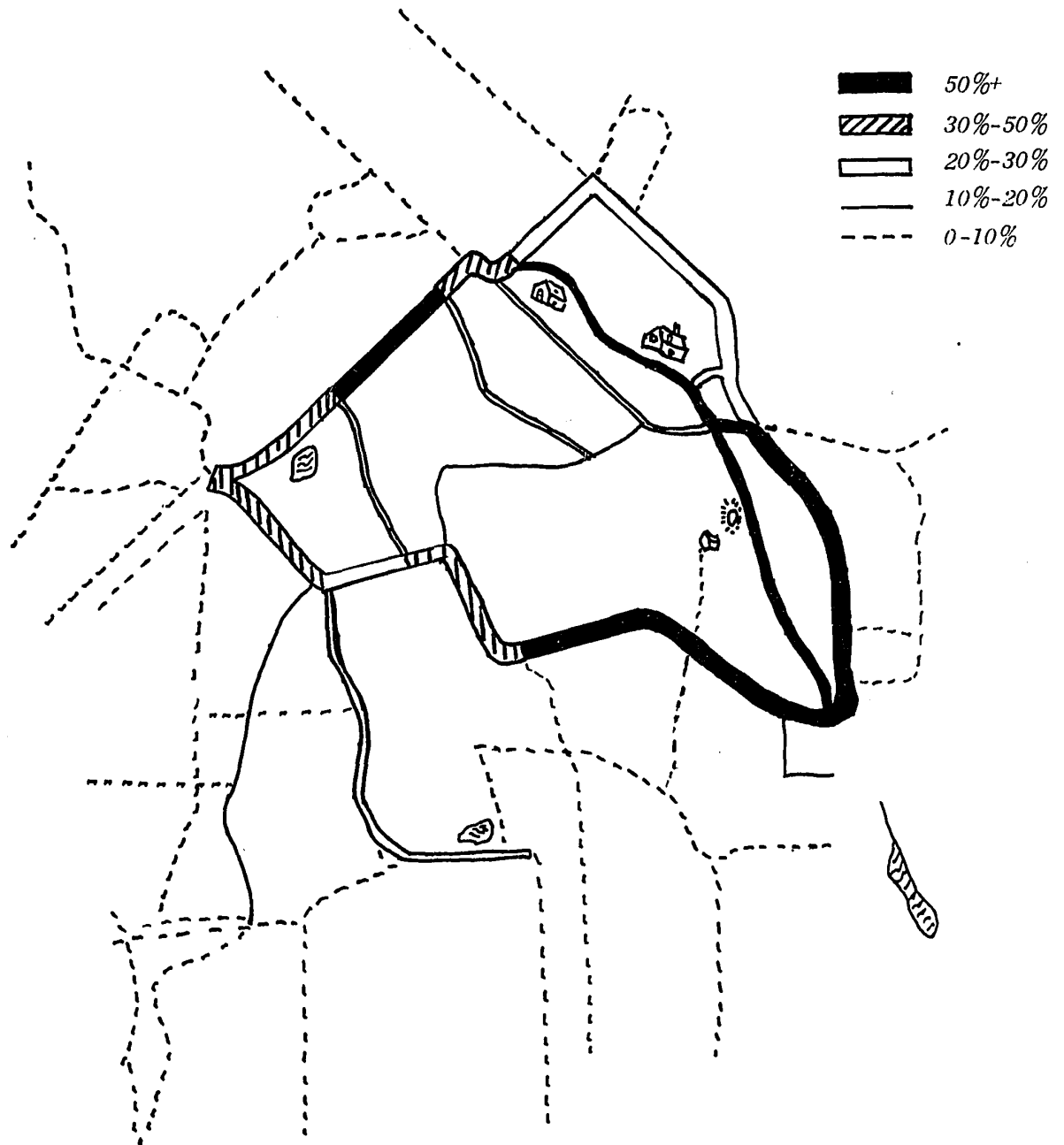


FIGURE 16

Summer trail use in Morgan Arboretum

Summer Trail Use



APPENDIX 1

ARBORETUM PRODUCTION FIGURES*

	June 1, 1969 May 30, 1970	June 1, 1970 May 30, 1971
	<u>Gross Returns</u>	<u>Gross Returns</u>
Fireplace wood	\$5,809.00	\$4,932.00
Tree and Shrub sales	1,800.00	2,100.00
Landscape and Ornamental trees	8,000.00	3,410.00
Christmas Tree Sale		
Scots pine	3,352.00	2,125.00
Balsam fir		1,400.00
Spruce	460.25	270.00
Pine boughs	492.00	380.00
Firewood	271.05	85.00
Miscellaneous	11.70	
Maple Syrup	3,500.00 +	3,328.00 +
Field trips		
Maple		1,000.00 +
Forest Conservation		3,000.00
	<hr/>	<hr/>
	\$23,696.00	\$22,030.00

* Does not include members contributions, gate receipts and McGill Contribution.

+ Approximate only; exact amount not available.

APPENDIX 2

Section 1

1. (a) Sex of person answering questionnaire: Male _____ Female _____
 Age group of person answering questionnaire:
 Under 20 _____ 20-30 _____ 31-40 _____ 41-50 _____ Over 50 _____
- (b) Usual place of residence (district): _____
- (c) Occupation _____
- (d) Please check the category of annual income:
 Under \$4000 _____ \$4000-5999 _____ \$6000-7999 _____ \$8000-9999 _____
 10,000-11,999 _____ 12,000-13,999 _____ Above 14,000 _____
- (e) Please circle the highest number of years of full-time schooling completed:
 Public School 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
 College or university 1, 2, 3, 4, 5
 Post-graduate studies 1, 2, 3, 4, 5 or more
2. (a) Approximately how many times did you visit ANY large forested city park (such as Mt. Royal) in the past 12 months? _____
- (b) Approximately how many times have you visited any Provincial or National Park in the past 12 months? _____
- (c) How many times have you gone camping within the past 24 months? _____
3. How do you feel about the following: (place an "x" in the appropriate boxes)

	Should have an open season	The present rules are fine	Should be more rigidly controlled	Should be outlawed	Have no opinion
Big Game Hunting					
Water fowl hunting					
Fishing					
Snowmobiling					

4. Please check those types of recreation equipment owned by you or members of your household:

Boat(s) _____	Snowshoes _____
Fishing equipment _____	Camp trailer _____
Hunting rifle or gun _____	Portable radio _____
Tent _____	Portable T.V. _____
Skis _____	None of the above _____
Snowmobile _____	Other (List) _____
5. Please check any or all organizations you have been a member of in the past 5 years:

Local Sportsmen's club _____	Audubon Society _____
Bird Club _____	Ski Club _____
Gun Club _____	Snowmobile Club _____
Boating Club _____	Conservation or Recreation Group _____
Garden Club _____	Hosteling club _____
Dog obedience club _____	None _____
Horseback riding club _____	
Other (list) _____	

Section 2

What is your attitude toward the following activities in relation to a public forested environment (such as Mt. Royal)?

	Not important	No opinion	Very important
1. A place to build a campfire			
2. Space for games (such as baseball or hockey)			
3. A place to picnic			
4. tobogganing			
5. Jogging			
6. A place to sail a boat			
7. A place to cycle			
8. A place to bring children to			
9. A place to study and read			
10. A place to walk with a member of the opposite sex			
11. Photography			
12. A place to obtain flowers, leaves, mushrooms, etc.			
13. A place to feed birds and other small wildlife.			
14. A place to drive to.			
15. Horseback riding			
16. Nature trails with educational signs.			
17. Organized recreation			
18. Snowmobiling			
19. Group discussions			
20. Refreshment stands			
21. Swimming			

Section 3 Recreation Users Attitude Questionnaire

These statements refer to YOUR attitude toward any public forested environment such as Mt. Royal. These statements are designed to study people's attitude toward recreation use.

Questionnaire Item	Yes	No Opinion	No
1. If you see a person doing something dangerous would you say something to him?			
2. If you see a person swinging from a bough of a tree and is in danger of breaking the limb and/or his leg, would you stop him?			
3. If you see trash left by other users of the area, would you remove the trash?			
4. Should campfires be permitted in special designated areas?			
5. If you see a horseback rider galloping at a dangerous speed, would you make an attempt to stop him?			
6. Should the owners of unleashed dogs which are annoying other users of the area be told to have their dogs leashed?			
7. Should there be any restricted areas in a public forested environment?			
8. Do you think that a person who is capable of making a campfire and is naturally taking all the precautions of safety should be allowed to?			
9. Should a person be allowed to run his dog unleashed in a public forested park?			
10. Should horseback riders be required to stay on designated trails?			
11. Should a person be allowed to cut brush or limbs from trees as long as they do not create an eyesore?			
12. Should portable radios be permitted in a public forested park?			
13. Do you agree that barking dogs and yelling people do not belong in a public forested environment?			
14. Do you agree that trails remove most of the fun of walking to a place?			
15. Do you agree that picnic table should only be placed in ONE spot in a large public forested environment?			
16. Do you think that signs of any type (i.e. trail signs, nature interpretation signs, etc.) should be excluded from a public forested environment?			
17. Do you think that benches should be placed in various places throughout the forested environment?			

Section 4 Outdoor Environment Attitude Test

For each item in the following list of possible features, activities or benefits associated with an outdoor environment, place an "x" in the box which best expresses your attitude toward having that feature, participating in that activity or receiving that alleged benefit from such experience.

Questionnaire Item	Dislike	Neutral	Favour
Camping (Backpacking)			
Tranquility			
Sleeping outdoors			
Hiking			
Solitude			
Enjoyment of nature			
Awareness of beauty			
Alpine meadows			
Absence of manmade features			
Drinking mountain water			
Virgin forest			
Lakes (natural)			
Timberline vegetation			
Vast areas and enormous vistas			
Physical exercise			
Rugged topography			
Native wild animals			
Looking at scenery			
Emotional satisfaction			
Cutting Christmas trees			
Camps for Organization			
Private cottages			
Purchasing souvenirs			
Snowmobiling			
Camping (with car)			
Equipped bathing beaches			
Automobile touring			
Powerboating			
Campsites with plumbing			
Developed resort facilities			

Continued....

Section 4

Questionnaire Item	Dislike	Neutral	Favour
Unchanged natural coastlines			
Reservoirs (manmade)			
Waterfalls and rapids			
Campsites and outhouses			
Remoteness from cities			
Absence of people			
Canoeing			
Picking flowers			
Taking pictures			
Mountain climbing			
Hearing naturalist talks			
Talking with tourists			
Viewing naturalist exhibits			
Breathing fresh air			
Getting physically tired			
Studying pioneer history			
Low cost outdoor recreation			
Learn to lead simple life			
Chance to acquire knowledge			
Chance to stumble into wealth			
Adventure			
Sense of personal importance			
Improve physical health			
Recapture pioneer spirit			
Relieve tension			
Attain new perspectives			
Chance to boast			
Sense of humility			
Family solidarity			
Chance for noble thoughts			

APPENDIX 3

PLEASE CHECK THE RESPONSE WHICH APPLIES TO YOU

1. If Morgan Arboretum had not been set aside for people to use where would you have gone to satisfy your recreational needs?
- (a) Would probably have not gone anywhere else. 1
 - (b) Would have found a similar place to exercise. 2
 - (c) Would have walked around my home. 3
 - (d) Would have gone to Mt. Royal in the city. 4
 - (e) Would have gone to a local city park. 5
 - (f) Would have gone elsewhere (Specify). 6
2. Have you visited Morgan Arboretum before you became a member?
- Yes 1
No 2
3. How did you first hear about Morgan Arboretum?
- (a) From a friend. 1
 - (b) From a relative. 2
 - (c) From School. 3
 - (d) Read about it (specify). 4
 - (e) Other (Specify). 5
4. List ALL applicable reasons for becoming a member of Morgan Arboretum.
- (a) To support the upkeep of the Arboretum for posterity. 1
 - (b) To maintain the land for recreation use. 2
 - (c) To protect the land against commercial exploitation. 3
 - (d) Someone suggested that I join. 4
 - (e) A place to walk the dog. 5
 - (f) A good place for me to walk. 6
 - (g) A place to bird-watch. 7
 - (h) A place to go horseback riding. 8
 - (i) A place to have peace and quiet. 9
 - (j) An easy place to get to. 10
 - (k) A well managed area. 11
 - (l) A good place to collect flora. 12
 - (m) A place for me to ski in winter. 13
 - (n) A place for me to jog. 14
 - (o) A place for me to go snowshoeing. 15
 - (p) A good place for me to take pictures of the flora and/or fauna. 16
 - (q) Other reason (specify). 17
5. Which activities do you like to participate in when you come to the Arboretum?
- | | |
|--|-------------------------------|
| (a) Walk along main roads. <u>1</u> | (h) Study nature. <u>8</u> |
| (b) Walk along marked trails. <u>2</u> | (i) Picnic. <u>9</u> |
| (c) Bird-watch. <u>3</u> | (j) Sugaring-off. <u>10</u> |
| (d) Jog. <u>4</u> | (k) Walk dog. <u>11</u> |
| (e) Cycle. <u>5</u> | (l) Ski. <u>12</u> |
| (f) Explore the area. <u>6</u> | (m) Snowshoeing. <u>13</u> |
| (g) Photography. <u>7</u> | (n) Horseback ride. <u>14</u> |
| | (o) Other(specify). <u>15</u> |

6. Please indicate all applicable reasons for spending time in the Arboretum.

- (a) Easy place to get to. _____ 1
- (b) Like the beauty of the place. _____ 2
- (c) Like the rustic atmosphere. _____ 3
- (d) Like to see wildlife. _____ 4
- (e) Like to cross-country ski. _____ 5
- (f) A nice place to take my friends to. _____ 6
- (g) I like to take a drive and is a nice place to come to. _____ 7
- (h) I like to go horseback riding. _____ 8
- (i) A good place for me to bird-watch. _____ 9
- (j) I like to picnic here. _____ 10
- (k) Other (Specify). _____ 11

7. Which of the above would you consider the major purpose of most visits made by you or members of your household during the past 12 months? If more than one activity, what were the 2nd and 3rd most important?

Major purpose _____
2nd most important _____
3rd most important _____

8. Concerning the trees in the Arboretum, which of the following is (are) applicable to you?

- (a) I cannot recognize one tree from the the next. _____ 1
- (b) I can only distinguish a conifer from a deciduous tree. _____ 2
- (c) I can recognize a maple tree and conifers only. _____ 3
- (d) I only know the trees which are marked with name plates. _____ 4
- (e) I think I can name most of the trees in the Arboretum. _____ 5
- (f) I don't really care whether I know the trees or not. _____ 6

9. Concerning the trails in the Arboretum, which of the following is (are) applicable to you?

- (a) They are all well marked and they are impossible to stray from the path. _____ 1
- (b) Only a few are well marked, and one can get lost on the ones that are not marked. _____ 2
- (c) There are too many trails. _____ 3
- (d) Horses should not be allowed on the walking trails. _____ 4
- (e) There should not be any trails at all. Those people who wish to walk can make their own trails. _____ 5

10. FOR DOG OWNERS ONLY

Was one of the reasons you became a member of the Arboretum because it was a good place to walk your dog?

Yes 1
No 2

11. When you walk your dog is it leashed or unleashed?

Leashed 1
Unleashed 2
Sometimes leashed 3
and sometimes unleashed 3

12. If the members of the Arboretum Association passed a bylaw restricting the Arboretum for people's use only (to the exclusion of dogs and horses) would you still remain a member?

Yes 1
No 2

13. FOR HORSEBACK RIDERS ONLY

Which of the following is applicable to you?

- (a) I ride alone. 1
(b) The entire family rides. 2
(c) Only the children ride. 3
(d) Only the husband and/or the wife ride. 4
(e) I use to go riding when I was younger. 5

14. If the members of the Arboretum Association passed a bylaw restricting the Arboretum for people's use only (to the exclusion of dogs and horses) would you still remain a member?

Yes 1
No 2

15. Fill in the boxes below indicating the number of times you went to Morgan Arboretum during the past 12 months.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

Circle the month(s) you think that Morgan Arboretum is most beautiful.

16. Does the whole family come or just some of the members?

Whole family 1
Adults only 2
Children come separately 3

17. What is the age, sex and number of family members?

Under 6 yrs. 1 From 21-30 yrs. 5
From 6-10 yrs. 2 Over 31 yrs. 6
From 11-14 yrs. 3
From 15-20 yrs. 4

Total no. of
Family members

18. Please indicate the total number of miles you must travel from your home to Morgan Arboretum.

from 1-3 miles	1	from 19-21 miles	7
from 4-6 miles	2	from 22-24 miles	8
from 7-9 miles	3	from 25-27 miles	9
from 10-12 miles	4	from 28-30 miles	10
from 13-15 miles	5	from 31-33 miles	11
from 16-18 miles	6	more than 33	12

19. If you have any suggestions concerning policy or improvements to the Arboretum please list them below:

- (a) _____

- (b) _____

- (c) _____

Have you gone camping in the past 24 months? Yes ___ No ___

If "Yes" How many times? _____

Have you visited any Provincial or National Park in the past 24 months? Yes ___ No ___

Have you visited any large forested city park (Such as Mt. Royal) within the past 12 months? Yes ___ No ___

If "Yes" about how many times? _____

20. How do you feel about the following: (Place an "X" in the appropriate boxes). These activities do not pertain to the Arboretum.

	Should have an open season	The present rules are fine	Should be more rigidly controlled	Should be outlawed	Have no opinion
Big game hunting	1	2	3	4	5
Water fowl hunting	6	7	8	9	10
Fishing	11	12	13	14	15
Snowmobiling	16	17	18	19	20

21. Please check those types of recreation equipment owned by you or members of your household:

(a) Boat	___1	(g) Snowshoes	___7
(b) Fishing equipment	___2	(h) Camp trailer	___8
(c) Hunting rifle or gun	___3	(i) Portable radio	___9
(d) Tent	___4	(j) None of the above	___10
(e) Skis	___5	(k) Other (List)	___11
(f) Snowmobile	___6		

22. Please check any or all organizations you have been a member of in the past 5 years:

(a) Bird Club	___1	(f) Audubon Society	___6
(b) Gun Club	___2	(g) Ski Club	___7
(c) Boating Club	___3	(h) Snowmobile Club	___8
(d) Dog Obedience Club	___4	(i) Conservation or Recreation Group	___9
(e) Horseback riding Club	___5	(j) None	___10
		(k) Other(List)	___11

23. Sex of person answering questionnaire: Male ___1 Female ___2

Age group of person answering questionnaire:

Under 20 ___ 20-30 ___ 31-40 ___ 41-50 ___ over 50 ___

Usual place of residence (district): _____

Your Occupation: _____

Please check the category of annual income of the principle wage earner in your family:

Under \$4000 ___ \$4000-5999 ___ \$6000-7999 ___ \$8000-9999 ___
\$10,000-11,999 ___ \$12,000-13,999 ___ Above \$14,000 ___

24. Please circle the highest number of years of full-time schooling of the principle wage earner in your family:

Public School 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,

College or University 1, 2, 3, 4, 5,

Post-graduate studies 1, 2, 3, 4, 5 or more

What is your attitude toward the following activities in relation to a public forested environment (Such as Mt. Royal Park in Montreal). Your responses to this group do not refer to the Arboretum, but to ANY public forested environment.

	Not important	No opinion	Very important
1. A place to build a campfire			
2. Space for games (Such as baseball or hockey)			
3. A place to picnic			
4. Tobogganing			
5. Jogging			
6. A place to sail a boat			
7. A place to cycle			
8. A place to bring children to			
9. A place to study and read			
10. A place to walk with a member of the opposite sex			
11. Photography			
12. A place to obtain flowers leaves, mushrooms, etc.			
13. A place to feed birds and small wildlife.			
14. A place to drive to.			
15. Horseback riding			
16. Nature trails with educational signs.			
17. Organized recreation.			
18. Snowmobiling.			
19. Group discussions.			
20. Refreshment stands.			
21. Swimming.			

APPENDIX 4

RECREATION USERS ATTITUDE QUESTIONNAIRE

Member_____ Non-member_____

These items refer to your attitude toward management policy in Morgan Arboretum. Not all of these statements are the policy of the members or management, they are merely a group of statements designed to study people's attitude toward recreation use.

J.I.

	Agree	No Opinion	Disagree
1. If you see a person in the Arboretum doing something he shouldn't do, you should say something to him.			
2. If you see a person swinging from a bough of a tree it is your duty to stop him.			
3. Trash left by previous Arboretum users should be removed by other users so that the place should be left clean.			
4. Campfires should be permitted in special designated places.			
5. If you see a horseback rider galloping at a dangerous speed, it is your duty to stop him.			
6. Unleashed dogs that annoy other recreation users in the Arboretum should be told by their owners to have their dogs leashed.			
7. There should be no restricted areas in the Arboretum.			
8. A person who feels that he is capable of making a campfire and is taking all the necessary precautions of safety should be allowed.			
9. A person should be allowed to run his dog unleashed even though there is a rule to the contrary.			
10. Horseback riders must stay on designated trails.			
11. The Arboretum should be open to anybody at anytime.			

	Agree	No Opinion	Disagree
12. Any person using the Arboretum must check in before he is given permission to use the place even though he is a member.			
13. A person should be free to cut brush or limbs from trees as long as they do not create an eyesore.			
14. Portable radios should not be permitted in the Arboretum.			
15. Barking dogs and yelling people do not belong in the Arboretum.			
16. Trails remove most of the fun of walking to a place.			
17. Picnic tables should be placed anywhere in the Arboretum.			
18. Signs of any type (i.e. trail signs, nature interpretation signs, etc.), should be excluded from the Arboretum.			
19. I consider Morgan Arboretum to be a private exclusive club open to a limited number of people.			
20. Non-members should be allowed to use the Arboretum on payment of an entrance fee.			
21. Members only should decide how the property should be used.			
22. Members should have the right to see that other members are suspended from the use of the property when breaking rules.			
23. Members only should formulate the management policy of the property.			
24. Since the Arboretum was set aside for recreation use, no university research should be permitted here.			
25. There should be more trail signs.			
26. The trail markers should have pictures rather than names.			

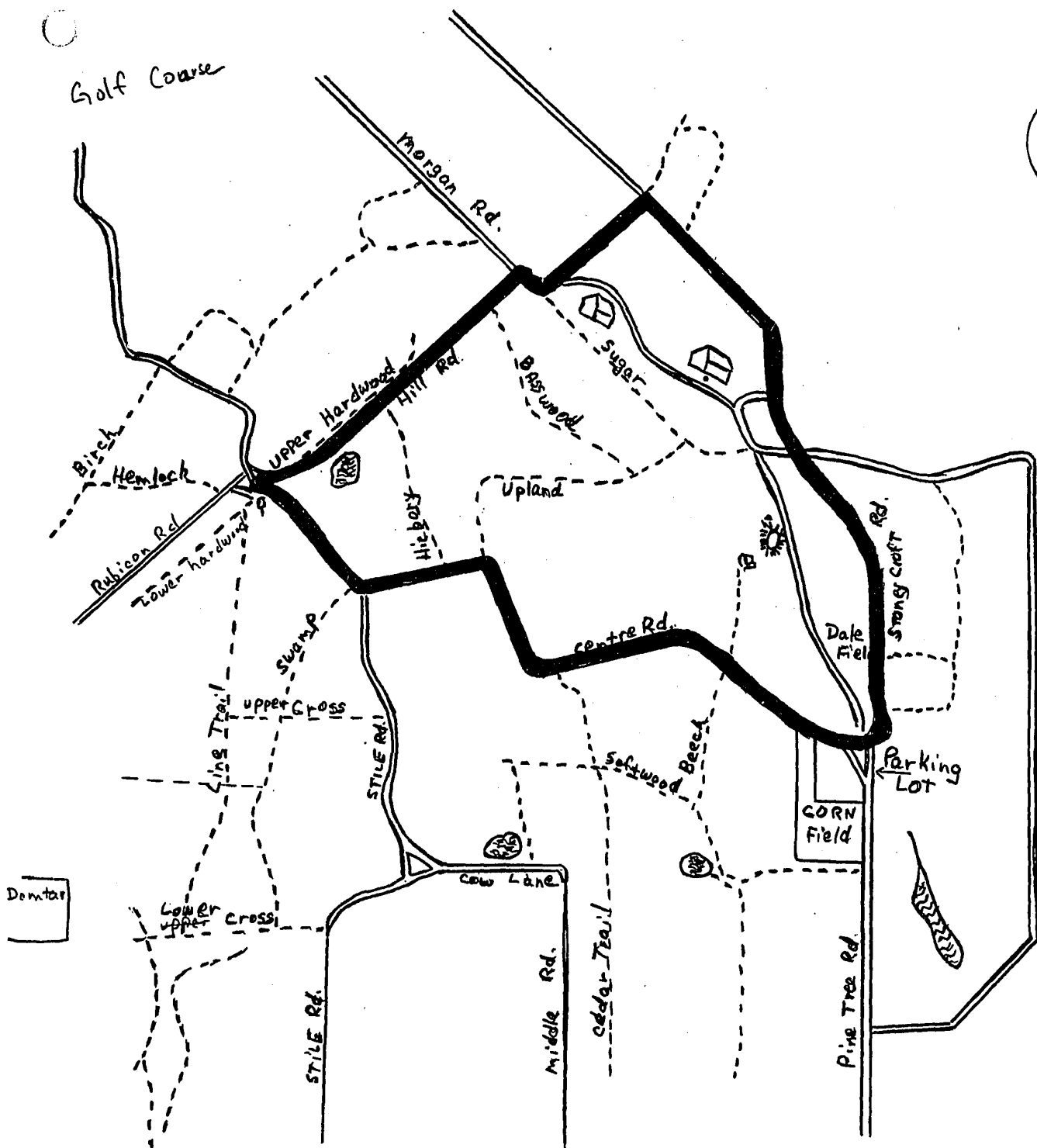
	Agree	No Opinion	Disagree
27. The Arboretum should be more of a "Nature Centre" . We should stock it with wildlife, and place nature interpretation signs in strategic spots.			
28. Chemical toilet facilities should be placed in at least one spot for public use.			
29. Picnic tables should be placed in <u>ONE</u> spot for use by the public.			
30. Benches should be placed in various places throughout the Arboretum.			

APPENDIX 5

GATE-KEEPERS RECORDS

Week ending

[illegible]



LITERATURE CITED

- Anonymous; 1956
Morgan Arboretum; A Project in Woodland
Conservation. Macdonald College. 17p.
- Anonymous; 1964
Annual Report. The Department of Woodlot
Management, Macdonald College and The Morgan
Arboretum and Woodland Development Association.
- Bowen, A. T. Jr.; 1963
A plan for the development of the Machias Lakes
region in Washington County, Maine. Bulletin 614.
May. Maine Agricultural Experiment Station,
University of Maine. 44p.
- Brittain, W. H.; 1954
History of Morgan Arboretum. Macdonald College
8p. typed.
- Burch, W. R. Jr., and Wenger, W. D. Jr.; 1967
The social characteristics of participants in
three styles of family camping. U. S. Department
of Agriculture Forest Service Research Paper
PNW-48. Government Printing Office, Washington,
D. C.
- Costner, H. L.; 1965
Criteria for measures of association. American
Sociological Review 30 (3): June 341-353
- Dixon, W. J. and Massey, F. J. Jr.; 1957
Introduction to statistical analysis. 2nd edition.
McGraw-Hill, New York. 377p.
- Hauser, P.M.; 1962
Demographic and ecological changes as factors in
outdoor recreation. In Outdoor Recreation
Resources Review Commission Study Report 20.
Government Printing Office, Washington, D. C. 27-59
- Heath, E. I.; 1964
Comparison of recreational development plans for
a northern Maine wilderness tract. Bulletin 628.
Oct. Maine Agricultural Experiment Station.
University of Maine. 51p.

- Hendee, J. C., Catton, W. R. Jr., Marlow, L. D., and Brockman, C. F.; 1968
Wilderness users in the Pacific Northwest--their characteristics, values and management preferences. U. S. Department of Agriculture Forest Service Research Paper PNW-61. Pacific Northwest Forest and Range Experimental Station., Portland, Oregon. 92p.
- Hendee, J. C.; 1969
Appreciative versus consumptive use of wildlife refuges: studies of who gets what and trends in use. North American Conference on Wildlife and Natural Resources. Transactions. Mimeo. 5p.
- Hewston, J. G. and Franklin, D. R.; 1969
Recreation use patterns at Faming Gorge Reservoir, 1963-65. Bureau of Sport Fisheries and Wildlife, Resource Publication 70. Jan. Washington, D. C. 80p.
- LaPage, W. F.; 1963
Some sociological aspects of forest recreation. Journal of Forestry 61: 32-36.
- Mead, M; 1962
Outdoor recreation in the context of emerging American cultural values: background consideration. In Outdoor Recreation Resources Review Commission Study Report 22. Government Printing Office. Washington, D. C. 2-24
- Nixon, H. N.; 1967
Banff National Park; aspects of visitors use. National Parks Service--Planning, Dept. of Indian Affairs and Northern Development, Ottawa. Report 26. March. 49p.
- Nixon, H. N.; 1967
Population trends in relation to the National Parks system. Planning report 61. National Parks Service--Planning, Department of Indian Affairs and Northern Development, Ottawa. October. 23p.
- Oppenheim, A. N.; 1966
Questionnaire design and attitudes measurement. McGraw-Hill, New York. 298p.
- Outdoor Recreation Resources Review Commission; 1962
Participation in outdoor recreation: factors affecting demand among American adults. Study Report 20. Washington, D. C. 100p.

- Stewart, B. E.; 1963
Recreational use of private land in a portion
of Eastern Maine. Miscellaneous Publication
658. Maine Agricultural Experimental Station,
University of Maine. 47p.
- Taylor, G. D.; 1965
Seasonal camping--Prince Albert National Park.
Recreational Research Report 16. National Parks
Branch, Ottawa. March. 4p.
- Taylor, G. D.; 1967
St. Lawrence Islands National Park. A visitor
use study, 1966. Report 30. National Parks
Service--Planning, Department of Indian Affairs
and Northern Development, Ottawa. 32p.
- Thorsell, J. W.; 1968
A trail use survey. Banff and Yoho National
Parks, 1967. Recreational Research Report 33.
National and Historical Parks Branch, Department
of Indian Affairs and Northern Development,
Ottawa. February. 57p.
- Twight, B. W.; 1968
The clientele of The University of Washington
Arboretum. Unpublished Masters Thesis.
University of Washington, Seattle. 82p.

ADDITIONAL BIBLIOGRAPHY

- Anonymous; 1962
Participation in outdoor recreation: factors affecting demand among American adults. Outdoor Recreation Resources Review Commission Study Report 20. Government Printing Office, Washington, D. C.
- Boster, R. S.; 1971
A critical appraisal of the environmental movement. Journal of Forestry 69 (1): Jan. 12-16.
- Burke, H. D.; 1967
Forest recreation research--a new understanding by U. S. Forest Service. N. Y. State Conservationist. 15 (4): 27-29.
- Campbell, F. L., and others; 1968
Law and order in public parks. Parks and Recreation. Dec. 28-31 and 51-55.
- Clawson, M. and Knetch, J. L.; 1966
Economics of outdoor recreation. Resources for the Future, Inc. Washington, D. C. 328p.
- Duncan, D. P.; 1971
Managing the forested environment: role of the professional. Journal of Forestry 69 (1): Jan. 8-11.
- Dyer, A. A. and Whaley, R. S.; 1968
Predicting use of recreational sites. Utah Agricultural Experimental Station Bulletin 477. Nov. 21p.
- Good, C. V. and Scates, D. E.; 1954
Methods of research. Appleton-Century-Crofts, Inc. New York.
- Green, A.; 1964
Recreation, leisure and politics. McGraw-Hill, New York.
- Greenleaf, R.; 1963
The integration of year round recreation and timberland management on the Passadumkeag Mountain Region of Eastern Maine. Maine Agricultural Experiment Station Bulletin 616. University of Maine. 60p.

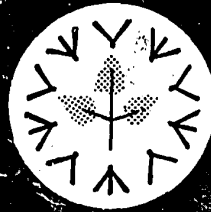
- Heath, E. I.; 1964
A plan for the development of nature trails
in the University of Maine Forest. Miscellaneous
Publication 663. Dec. Maine Agricultural
Experimental Station. University of Maine.
16p.
- Hendee, J. C., and Campbell, F. I.; 1969
Social aspects of outdoor recreation--the
developed campground. Trends in Parks and
Recreation. Oct. 13-16.
- Hendee, J. C. and Harris, R. W.; 1970
Foresters' perception of wilderness--user
attitudes and preferences. Journal of Forestry.
68 (12): Dec. 759-762.
- Hopkins, W. S.; 1967
Outdoor recreation--some human resource
considerations as a land resource base. The
First Recreation Management Institute.
Transcript. Sept. 24 - Oct. 6. Mimeo. 4p.
- Hopkins, W. S.; 1968
Forestry recreation research--some problems,
some accomplishments, some goals. Allegheny
Section of the Society of American Foresters.
February 9. Pittsburg, Penn. Transcript.
Mimeo. 3p.
- Hopkins, W. S.; 1969
Forest recreation research. Statistical
Reporter, 70 (5). Nov. 61-69.
- James, G. A. and Ripley, T. H.; 1963
Instructions for using traffic counters to
estimate recreation visits and use. U. S.
Department of Agriculture Forest Service
Research Paper SE-3. March. Southeastern
Forest Experimental Station, Ashville,
North Carolina. 12p.
- James, G. A. and Rich, J. L.; 1966
Estimating recreation use on a complex of
developed sites. U. S. Department of
Agriculture Southeastern Forest Experiment
Station, Ashville, North Carolina. 8p.

- James, G. A. and Taylor, G. D.; 1967
Recreation use estimation in the United States and Canada. International Union Forestry Resources Organization. Munich, Germany. 15-29.
- James, G. A.; 1968
Pilot test of sampling procedures for estimating recreation use on winter-sports sites. U. S. Department of Agriculture Forest Service Research Paper SE-42. Southeastern Forest Experimental Station, Ashville, North Carolina. 8p.
- Jones, A. R. C.; 1969
Annual Report. The Department of Woodlot Management, Macdonald College and The Morgan Arboretum Association. McGill University, Montreal. 31p.
- LaPage, W. F.; 1969
The camper views the interview. Journal of Leisure Research. 1 (2) Spring. 181-186.
- LaPage, W. F.; 1969
The family camping phenomenon--motivation--ways and means--accommodations. Southeastern Park and Recreation Training Institute. Feb. 25-28. North Carolina State University. Raleigh, North Carolina. Proc. 14: 14-20.
- Lime, D. W. and Cushwa, C. T.; 1969
Wildlife esthetics and auto campers in the Superior National Forest. U. S. Department of Agriculture Forest Service Research Paper NC-32. North Central Forest Experimental Station. St. Paul, Minn. 8p.
- Lucas, R. C.; 1962
Bias in estimating recreationists length of stay from sample interviews. Journal of Forestry, 61: 912-914.
- Lucas, R. C.; 1970
User evaluation of campgrounds on two Michigan National Forests. U. S. Department of Agriculture Forest Service Research Paper NC-44. North Central Forest Experimental Station, St. Paul, Minnesota. 15p.

- McCurdy, D. R.; 1970
A manual for measuring public use of
wildlands--parks, forests and wildlife
refuges. Dept. of Forestry Publication 5,
December. Southern Illinois University,
Carbondale, Ill. 48p.
- McKinley, D.; 1963
Why wilderness?
Forest Industries, February. 38-39
- Nixon, H. N.; 1968
Riding Mountain National Park. Visitor
pattern survey, 1967. Report 39. National
Parks Service--Planning Department of
Indian Affairs and Northern Development,
Ottawa. June. 40p.
- Outdoor Recreation Research; 1966
A reference catalog, October. Department
of the Interior; Bureau of Outdoor Recreation,
Washington, D. S. 86p.
- Outdoor Recreation Research; 1967
A reference catalog. March. Department of
the Interior; Bureau of Outdoor Recreation,
Washington, D. C. 177p.
- Outdoor Recreation Research; 1969
A reference catalog; January. Department
of the Interior; Bureau of Outdoor Recreation;
Washington, D. C. 126p.
- Smith, F. E.; 1970
Ecological demand and environmental response.
Journal of Forestry 68 (12) Dec. 752-755.
- Stone, G. P. and Taves, M. J.; 1957
Research into the human element in wilderness
use. Society of American Foresters. University
of Minnesota, Minneapolis. Proc. 1956. 26-32.
- Taylor, G. D.; 1966
An appraisal of public reaction to campgrounds
facilities and standards. Two Jack Lake
campgrounds, Banff National Park. Recreational
Research Report 20. Natural and Historical
Resources Branch, Department of Northern
Affairs and Natural Resources, Ottawa. April.
21p.

- Taylor, G. D.; 1966
Visitors to the National Parks. A summary
Report, 1965. Recreational Research Report 23.
National and Historical Parks Branch, Department
of Indian Affairs and Northern Development.
November. 18p.
- Wagner, J. A.; 1963
What people want in forest recreation.
Outdoor West Virginia, 27 (5). 9-12.
- Wagner, J. A.; 1963
What people want in forest recreation.
Pennsylvania Forests, 53: 6-7.
- Wagner, J. A. and Thalheimer, J. F.; 1969
Trial results of net count procedures for
estimating visitor use at developed recreation
sites. U. S. Department of Agriculture
Forest Service Research Note INT-105.
Intermountain Forest and Range Experimental
Station; Ogden, Utah. 4p.
- Wennergren, E. B.; 1967
Surrogate pricing of outdoor recreation.
Land Economics, 43 (1). February. 112-116.
- Wennergren, E. B., and Nielsen, D. B.; 1968
A probabilistic approach to estimating demand
for outdoor recreation. Utah Agricultural
Experimental Station, Bulletin 478. December.
27p.
- Whitney, F. L.; 1950
The elements of research.
Prentice-Hall, Inc., New Jersey.
- Whorton, C. H.; 1970
The Southern River swamp--a multiple use
environment. Bureau of Business and Economic
Research. May. School of Business Administration,
George State University. 48p.
- Winthrop, H.; 1968
Ventures in social interpretation.
Appleton-Century Crofts. New York.
- Young, R. A., Holland, I. I., and Gilmore, A. R.; 1970
Getting better returns from mail questionnaires.
Journal of Forestry 68 (11). November. 723-724.

Morgan arboretum

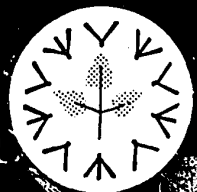


Macdonald
College
P. Que.



Be a conservationist Soyez des apôtres de la conservation
Use extreme caution with fire. Prévenez les incendies.

Morgan arboretum



Macdonald
College
P. Que.

WOOD HARVEST LA RÉCOLTE FORESTIÈRE



ARBORETA



MAJOR LAND USES

60 acres of producing and experimental sugar bush.

Study areas for coniferous management.

Silvicultural studies for sustained-yield forestry.

22-acre preserve where nature takes its course undisturbed.

Forest tree nurseries — plantation trials for promising softwood and hardwood species.

Groups of Canadian trees for the study of their forestry and ornamental uses.

Canada-wide collection of white birch varieties of historical, scientific and commercial interest, together with a special "trail" of specimens representative of all provinces and territories.

Water sources for fire-fighting, wildlife conservation and recreation.

Seven-acre woodland for bivouacs and survival training.

SUGAR MAPLE GROVES

SOFTWOOD FOREST

HARDWOOD FOREST

ECOLOGICAL RESERVE

NURSERIES AND REFORESTATION

ARBORETA

CANADA BIRCH TRAIL

PONDS

WINTER CAMPSITE



P

ÉR

FO

CO

FOI

SAI

ÉCC

PÉP

REB

COI

D'A

LE

BOI

CAI

ÉTA

TERI

CAN

D'HI

SOME SEASONAL ACTIVITIES

A modern commercial operation with applied research on new methods.

Tree harvesting by various methods perpetuates the forest and maximizes returns for the owner.

Planting and species trials for timber production and landscape uses.

Christmas trees and greens, maple syrup, plant sales, wood products. An important source of income provides useful market and profit information.

Educational tours to demonstrate modern forestry and conservation methods.

To study the many aspects of field biology and exchange information with visiting scientists.

12 miles of trails provide varied scenery for pleasant outings.

A bird sanctuary and botanical trail aid amateurs and professionals to follow their interests.

Basic training for study of the renewable natural resources of soil, water, wildlife and forest.

Initial conservation education and general instruction in wise natural resources use.

Roads and trails serve the needs of equestrians.

A quiet and changing outdoor atmosphere greet the visitor.

MAPLE SUGARING

WOOD CUTTING

TREE PLANTING

PRODUCT SALES

FIELD DAYS

SCIENTIFIC GROUPS

HIKING AND SKIING

BIRD WATCHING AND NATURE STUDY

SCOUT AND GUIDE GROUPS

SCHOOL VISITS

RIDING

RELAXATION



Q

LES

COU

PLAI

D'AF

VEN

JOUI

D'EX

EN I

GRO

SCIE

EXCI

À PI

OBSI

D'OI

DE LI

GRO

ET DE

VISI

ÉQUI

DÉTÉ

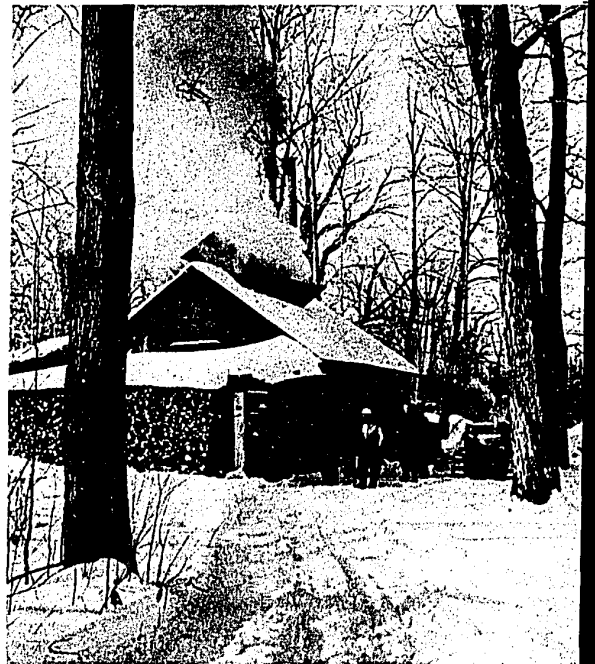
PRINCIPALES UTILISATIONS DES SOLS

ÉRABLIÈRES	60 acres de boisés d'érables productifs et expérimentaux.
FORÊT DE CONIFÈRES	Etendues destinées à l'étude de l'aménagement des conifères.
FORÊT DE FEUILLUS	Etudes sylvicoles en fonction des rendements forestiers continus.
SANCTUAIRE ÉCOLOGIQUE	Réserve de 22 acres où on laisse la nature suivre son cours.
PÉPINIÈRES ET REBOISEMENT	Pépinières d'arbres forestiers — plantation de résineux et de feuillus dont les essences sont prometteuses.
COLLECTION D'ARBRES	Arbres canadiens pour l'étude de leurs possibilités comme arbres forestiers ou ornementaux.
LE SENTIER DES BOULEAUX CANADIENS	Une partie d'une collection de plusieurs variétés de bouleau blanc ayant un intérêt historique, scientifique et commercial longe le parcours d'un sentier.
ÉTANGS	Etendues d'eau appelées à servir à la lutte contre les incendies, à la conservation de la faune et à la récréation.
TERRAINS DE CAMPEMENT D'HIVER	Sept acres de boisé pour les bivouacs et pour les cours de survivance.

QUELQUES ACTIVITÉS SAISONNIÈRES

LES SUCRES	Une opération commerciale dans laquelle de nouvelles techniques sont mises à l'essai.
COUPES DE BOIS	Les arbres sont récoltés suivant diverses méthodes permettant à la forêt de se perpétuer, tout en donnant un revenu maximum à son propriétaire.
PLANTATIONS D'ARBRES	Plantations et essais de production d'arbres forestiers et ornementaux.
VENTE DE PRODUITS	Arbres de Noël, branches de conifères, sirap d'érable, semis et autres produits forestiers qui peuvent être achetés. Les ventes sont une source de revenus et de renseignements sur les marchés et les profits.
JOURNÉES D'EXCURSIONS EN FORÊT	Excursions éducatives servent à illustrer les techniques modernes utilisées en sylviculture et en conservation.
GROUPES SCIENTIFIQUES	Etudes des nombreux aspects biologiques. Echanges d'information avec les hommes de sciences qui nous visitent.
EXCURSIONS À PIED ET EN SKI	12 milles de sentiers — excellent endroit pour les amateurs de la vie au grand air.
OBSERVATION D'OISEAUX ET ÉTUDE DE LA NATURE	Un sentier sillonnant un sanctuaire d'oiseaux et un milieu botanique très intéressant pour les amateurs et les professionnels.
GROUPES DE GUIDES ET DE SCOUTS	Formation de base pour l'étude des ressources naturelles renouvelables; en sol, eau, faune et forêt.
VISITES D'ÉTUDIANTS	Enseignement élémentaire de la conservation et cours généraux sur l'utilisation rationnelle des ressources naturelles.
ÉQUITATION	Les routes et les sentiers répondent aux besoins des cavaliers et des amazones.
DÉTENTE	Les visiteurs bénéficient de tous les plaisirs de la vie en pleine nature.

MAPLE SUGARING LES SUCRES

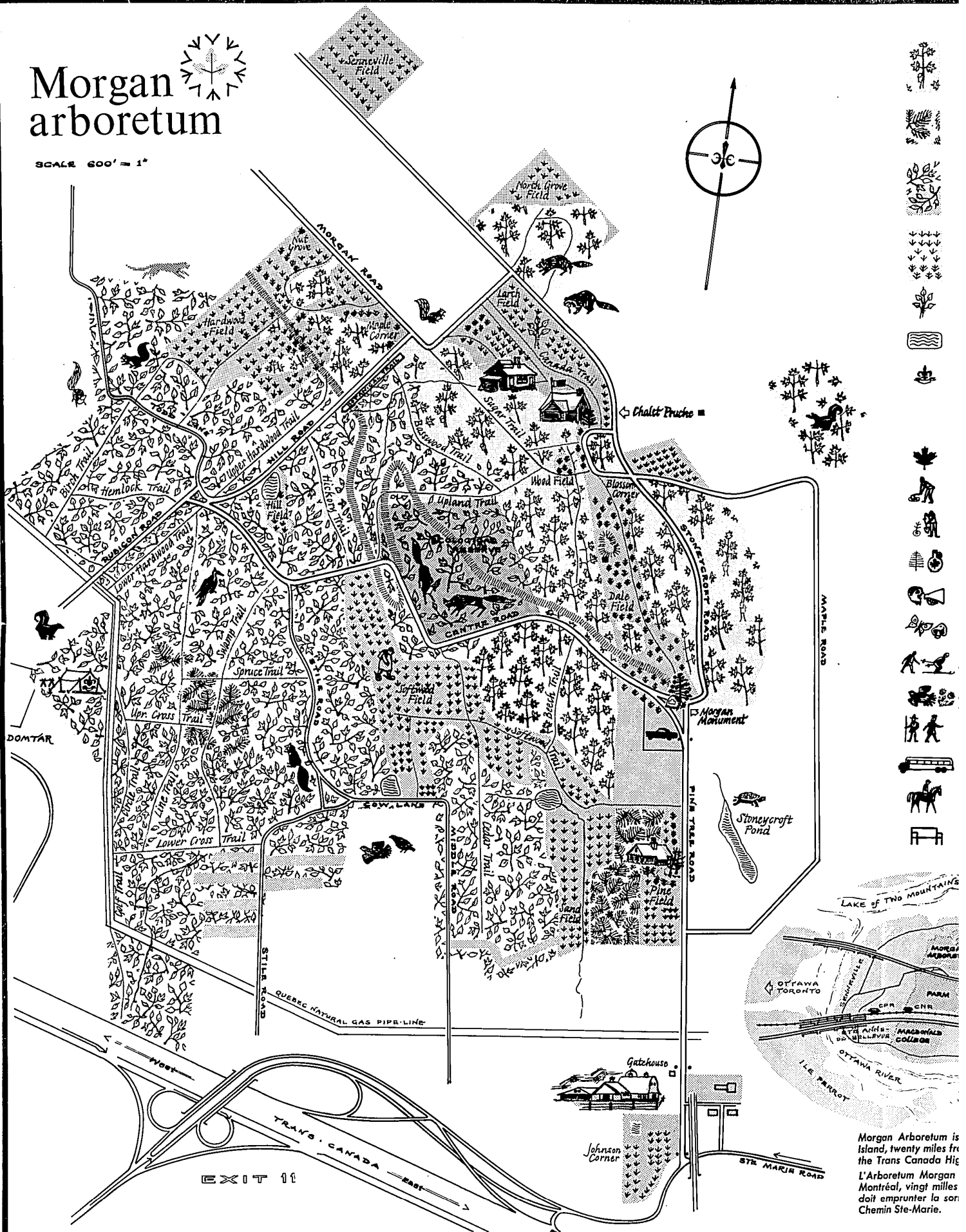


EDUCATION AND RESEARCH ENSEIGNEMENT ET RECHERCHES

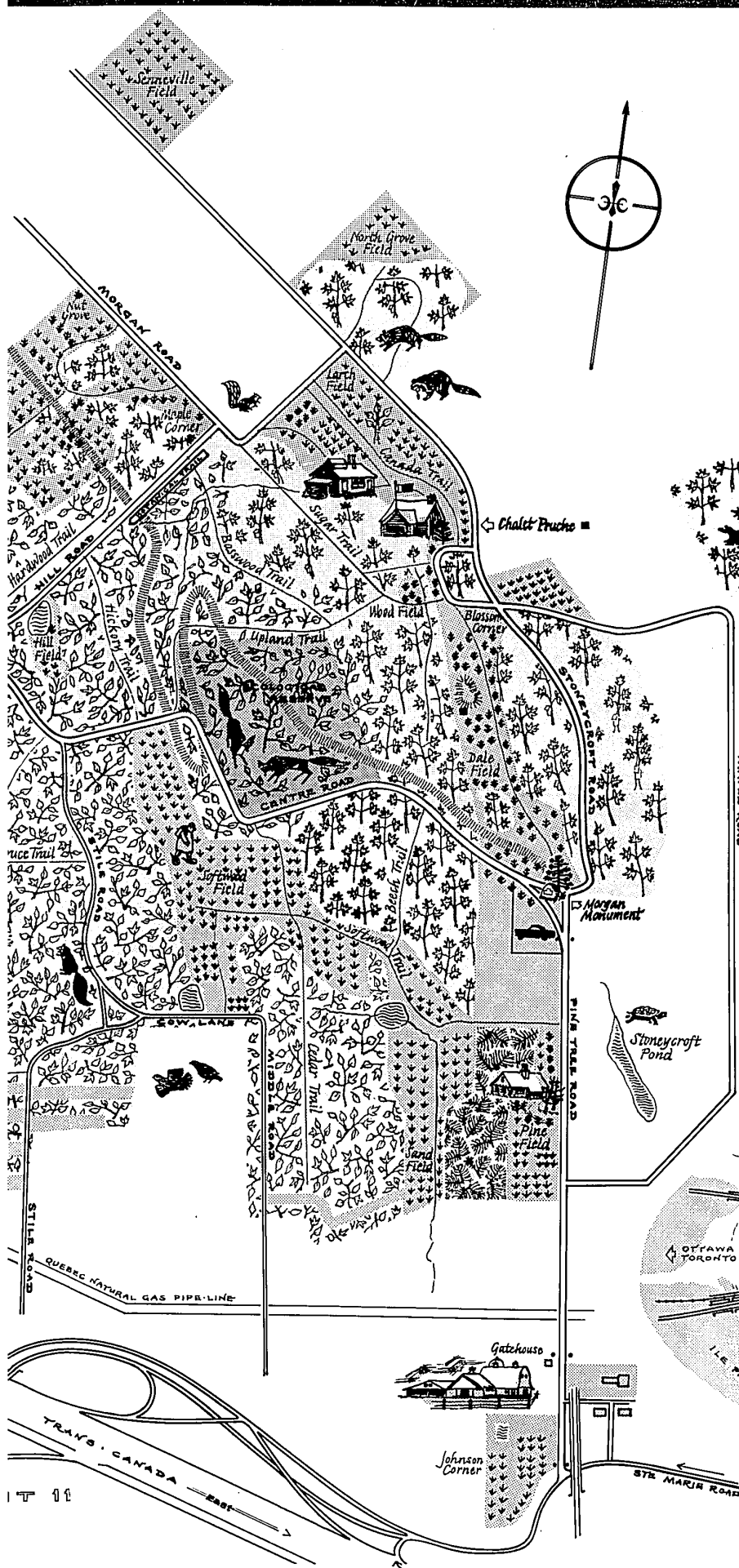


Morgan arboretum

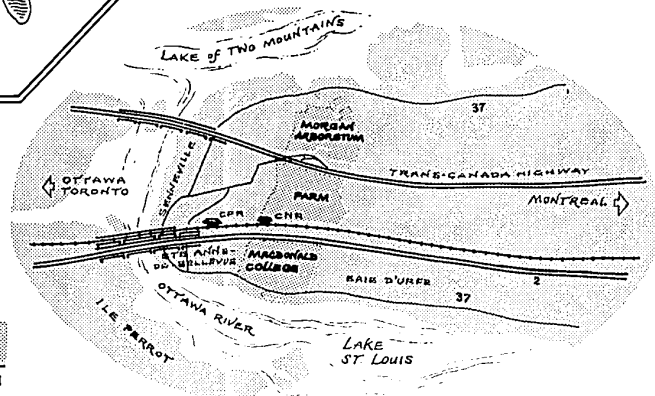
SCALE 600' = 1"



Morgan Arboretum is
Island, twenty miles from
the Trans Canada Hwy
L'Arboretum Morgan
Montréal, vingt milles
doit emprunter la son
Chemin Ste-Marie.



LEGEND MAJOR LAND-USES	LÉGENDE PRINCIPALES UTILISATIONS DES SOIS
	SUGAR MAPLE GROVES ÉRABLIÈRES
	SOFTWOOD FOREST FORÊT DE CONIFÈRES
	HARDWOOD FOREST FORÊT DE FEUILLUS
	ECOLOGICAL RESERVE SANCTUAIRE ÉCOLOGIQUE
	NURSERIES AND REFORESTATION PÉPINIÈRES ET REBOISEMENT
	ARBORETA COLLECTIONS D'ARBRES
	CANADA BIRCH TRAIL LE SENTIER DES BOULEAUX CANADIENS
	PONDS ÉTANGS
	WINTER CAMPSITE TERRAINS DE CAMPÈMENT D'HIVER
	JOHNNY-ON-THE ■ TOILETTE
	SOME SEASONAL ACTIVITIES QUELQUES ACTIVITÉS SAISONNIÈRES
	MAPLE SUGARING — EARLY SPRING LES SUCRES — DÉBUT DU PRINTEMPS
	WOOD CUTTING — LATE FALL, WINTER AND SUMMER COUPES DE BOIS — TARD L'AUTOMNE, L'HIVER ET L'ÉTÉ
	TREE PLANTING — SPRING AND FALL PLANTATIONS D'ARBRES — PRINTEMPS ET AUTOMNE
	PRODUCT SALES — YEAR AROUND VENTE DE PRODUITS — À L'ANNÉE LONGUE
	FIELD DAYS JOURNÉES D'EXCURSIONS EN FORÊT
	SCIENTIFIC GROUPS GROUPE SCIENTIFIQUES
	HIKING AND SKIING EXCURSIONS À PIED ET PRATIQUES DE SKI
	BIRD WATCHING AND NATURE STUDY OBSERVATION D'OISEAUX ET ÉTUDE DE LA NATURE
	SCOUT AND GUIDE GROUPS GROUPE DE GUIDES ET SCOUTS
	SCHOOL VISITS VISITES D'ÉTUDIANTS
	RIDING EQUITATION
	RELAXATION DÉTENTE



Morgan Arboretum is located at the western tip of Montreal Island, twenty miles from the centre of the city. It is reached from the Trans Canada Highway (Exit 11) and the Ste. Marie Road. L'Arboretum Morgan est situé à l'extrémité ouest de l'île de Montréal, vingt milles du centre de la ville. Pour s'y rendre, on doit emprunter la sortie 11 de la route Transcanadienne et du Chemin Ste-Marie.