INTERNATIONAL COOPERATION AMONG BOTANIC GARDENS:
THE CONCEPT OF ESTABLISHING AGREEMENTS

By

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No man is an *Il*and, intire of it selfe;
every man is a peece of the *Continent*, a part of the *maine*;
if a *Clod* bee washed away by the *Sea, Europe* is the lesse,
as well as if a *Promontorie* were,
as well as if a *Mannor* of thy *friends* or of *thine owne* were;
any mans *death* diminishes *me*,
because I am involved in *Mankinde*;
And therefore never send to know for whom the *bell* tolls;
It tolls for *thee*.

- JOHN DONNE -

In the Seventeenth Meditation
of the Devotions Upon Emergent Occasions (1624)
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# TABLE OF CONTENTS

ABSTRACT ............................................................................. ix

INTRODUCTION ....................................................................... 1

Chapter

I. INTERNATIONAL COOPERATION AMONG BOTANIC GARDENS

A. Forward ................................................................. 7
B. International Transfer of Plant Taxa ......................... 8
   1. Plant Exploration ..................................................... 8
   2. Dry Plant and Related Materials Exchanges ........... 22
      a. Seeds, Seed Lists and Seed Banks ....................... 23
      b. Cooperation among Herbaria ............................. 32
   3. The Influence of Laws and Policies ......................... 37
      a. CITES .......................................................... 38
      b. Sovereignty over Natural Resources ................. 45
C. Plant Conservation and Botanic Gardens .................. 49
   1. Intrnational Cooperation in Global Perspective ....... 52
   2. Conservation through International Cooperation ...... 65
      a. In Situ and Ex Situ Policies in Cooperation .......... 72
D. Idea and Information Exchanges ............................... 82
   1. Personnel Exchanges ............................................ 82
   2. Written and Electronic Information Exchanges ....... 89
E. Cooperation through Organizations and Conferences .. 99
F. Institution Building ..................................................... 108
II. THE CONCEPT OF ESTABLISHING AGREEMENTS

A. Forward ................................................................. 114
B. The Degree of Agreement Formality .............................. 114
C. Some Ideas on Writing Agreements ............................... 140

CONCLUSION ............................................................... 149

BIBLIOGRAPHY ........................................................... 154

APPENDICES ............................................................... 171

Appendix A: Survey Results: International Cooperation
Among Botanic Gardens .............................................. 172
Appendix A (1): The Survey Questionnaire ....................... 175
Appendix A (2): An International Profile
of Institutions Surveyed ............................................ 184
Appendix A (3): Survey Results .................................... 191
Appendix A (4): Representative/Noteworthy
Comments ............................................................... 197

Appendix B: The Convention on International Trade
in Endangered Species of Wild Fauna and Flora
(CITES) ................................................................. 215

Appendix C: The Appendices to CITES ............................. 245
Appendix D: Resolutions of the Kew Conference of 1978 ..... 252
Appendix E: The Canary Declaration of 1985
and Recommendations ................................................ 255

Appendix F: Constitution: The International Association
of Botanical Gardens (IABG) ........................................ 267

Appendix G: Pertinent International Organizations ............. 271

Appendix H: The Desert Botanical Garden/CIDESON
Agreement ............................................................... 277

Appendix I: Guidelines for a Standard Agreement
Document ............................................................... 281

Appendix J: The Wisconsin/Heilongjiang Agreement .......... 284
ABSTRACT

Comprehensive, coordinated international cooperation among botanic gardens is an emerging concept, being based on the mutual benefits for all concerned.

Established, oftentimes, as manifestations of European colonial expansionism, the botanic gardens of today have become increasingly isolated and found their positions eroding with the dissolution of world empires.

In this research, I propose the following thesis: For the world's botanic gardens and similar institutions to continue to play an important role in the plant sciences, it is imperative that these institutions cooperate at not only the national and regional levels but ultimately at the international level. Furthermore, if significant and effective international cooperation is to occur among botanic gardens, it is best to formalize agreements, by
developing written documents.

As the traditional stewards of the world's plant resources, botanic gardens must accept the growing challenge of conserving plant taxa for posterity. Complete conservation coverage of all threatened and endangered plant taxa can not be accomplished by individual botanic gardens. The reduction of duplications of effort dictate the need for botanic gardens to engage in international cooperation activities.

Plant conservation is not the only reason for botanic gardens to engage in international cooperation activities. Given the new political, cultural and economic factors facing the world's botanic gardens, international cooperation in plant exploration, plant exchanges, institution building and information exchanges is becoming increasingly requisite for successful institutional operation now and into the future.

Informal cooperation must be expanded to more formalized levels with commitments to international cooperation
being supported by written documents of agreement. By writing agreements, botanic gardens insure a greater probability of success by providing for clearly documented statements of intentions, expectations and abilities as well as long-term institutional memories of cooperation efforts, a means by which external sources of funding may be obtained and gauges by which progress may be assessed and activities may be evaluated.
INTRODUCTION

For the purpose of this thesis, international cooperation among botanic gardens and similar institutions is defined as any mutually beneficial contacts that the aforementioned institutions have with comparable institutions in other nations.

According to Ern (1987a), botanic gardens and arboreta can be defined as those institutions that are administered by botanists, maintain documented, scientific plant collections and support an herbarium and library. Though the information presented relates to the goals and needs of botanic gardens and arboreta, much of what is included can apply equally to similar institutions such as horticultural display gardens, botanical/horticultural societies and associations, etc. The term botanic garden shall be used from this point on to generally refer to all of these institutions.
There is considerable international work being done by institutions with missions related to those of botanic gardens. Agricultural research services, forestry organizations, parks departments, university departments, environmental and conservation organizations, zoological parks, etc. all have international ventures. Whenever reference is made to the work being done by one of these related institutions it is because of some pertinence to international cooperation among botanic gardens.

Rather than a limited, in-depth approach to any one aspect of international cooperation among botanic gardens, this thesis is developed as a comprehensive, general primer. It is best used by individuals or institutions interested in obtaining an overall picture of current ideas, issues and procedures with regards to international cooperation among botanic gardens.

As Brockway (1979) points out, botanic gardens have had a glorious international past. This is especially true in endeavors such as plant exploration. The British, French, German, Dutch and
Belgian empires relied on the establishment of botanic gardens worldwide to act as imperial networks for the exploitation of plant resources. This was done for European civilization initially and ultimately has benefited all of mankind. Hahn portrays for us those colorful, intrepid individuals who traveled the world looking for exotic plant species, "... names such as E. H. Wilson, Frank Kingdom Ward, Robert Fortune and a host of others are permanently fixed in the history of horticulture ..." (1987, 9).

Independence and nationalism, politics and economics have greatly changed the relations that nations, and subsequently the institutions, have with each other. Botanic gardens in technologically developed countries (TDC's) should realize that there are "new rules" (Creech 1987, 3) that need to be accepted and adhered to by all botanic gardens.

For botanic gardens to retain preeminence in the plant sciences, it is imperative that national, regional and international cooperation policies be implemented. Furthermore, independence, national sovereignty, development needs and
professional respect all seem to point to a greater insistence that cooperation be bilateral or multilateral rather than the unilaterally beneficial courses so prevalent in the past.

This thesis concerns itself only with those events that are bilateral or multilateral, or have the potential for being so. It is in this spirit of international cooperation that this thesis is undertaken. My thesis statement is as follows:

For the world's botanic gardens to continue to play an important role in the plant sciences, it is imperative that these institutions cooperate at not only the national and regional levels but ultimately at the international level. Furthermore, if significant and effective international cooperation is to occur among botanic gardens, it is best to formalize agreements by developing written documents.

This thesis is divided into two chapters. The first chapter brings together and describes some of the ways that botanic gardens currently cooperate. This chapter speculates as to
possible directions in which to channel the efforts of botanic gardens for greatest effectiveness.

The second chapter deals with the concept of how formal international cooperation among botanic gardens should be. This chapter brings out some of the benefits and drawbacks of each position with particular emphasis on the concept of written agreements. This chapter also provides some ideas concerning the actual writing of agreements. This information draws on common international procedures as well as the select experiences of botanic gardens in various parts of the world.

This thesis ends with a collection of appendices. These appendices are included as a convenient reference and resource. I would like to draw particular attention to Appendix A on page 172. This appendix presents the complete results of a survey into international cooperation that I conducted in 1987 involving 300 botanic gardens in 89 nations. Some of the other appendices include items such as the names and addresses of pertinent international organizations as well as international documents of
agreement considered important to this thesis.
Chapter I

INTERNATIONAL COOPERATION AMONG BOTANIC GARDENS

A. Forward

This chapter looks at the various ways that botanic gardens interrelate with counterpart institutions in foreign nations. Generally, it is concerned with illustrating the current-day bilaterally/multilaterally beneficial forms of cooperation that either do occur among botanic gardens or have the potential for occurring.

This chapter provides the reader with advice and procedures that are deemed to be professionally and culturally desirable.

In most cases, the information presented is based on the direct experiences of botanic gardens worldwide. This
information is at times supplemented with the experiences of related professions and/or their institutions. I likewise draw on the experiences of institutions at the national and regional level with regards to cooperation and to the possibilities of similar cooperation when done at the international level.

**B. International Transfer of Plant Taxa**

The transfer of plant taxa is one of the most visible forms of cooperation that occurs among botanic gardens. This section of the chapter looks at the various ways that plant taxa are exchanged and provides information on international plant exploration, plant exchanges involving seeds and the cooperation that occurs among the world's herbaria.

**1. Plant Exploration**

The history of plant exploration has always been one of intrigue and fascination. Though history is replete with the accounts of plant hunters of the eighteenth, nineteenth and twentieth centuries, the concept of mankind moving plants from
one geographic area to another probably predates recorded history. The oldest known record of such activities goes back over four millennia (Ryerson 1966).

The value of plant exploration and introductions to any particular nation can hardly be challenged. Many of the plants being grown in a nation for use as food, fiber, medicine and ornamentals have in reality been assembled from a variety of geographic areas. "With the exception of corn and tobacco and a few minor products, all the field crops grown in continental United States have been introduced" (Ryerson 1966, 1). Thirty-eight percent (38%) of those institutions responding to my survey (Appendix A, page 172) included plant exploration as at least one form of cooperation that they engaged in.

Though the intentions in plant exploration have often been that of the exploitation of world resources by the colonial powers (Brockway 1979), it has been argued that some benefits have indeed been realized by other nations as well. A stimulated local agriculture (Dunlap 1966) and an enhanced local employment of
Technologically Lesser Developed Country (TLDC) nationals (Grey-Wilson, Knees and Mathew 1987) are two commonly cited examples of a reciprocation of benefits brought about by Technologically Developed Country (TDC) initiated activities in this realm.

As Brockway (1979) and Watkins (1966) point out, it is a fact that many of the world's botanic gardens were established as sites for introduction and trial of exotic plant taxa. Nearly all of the early botanic gardens that arose in what are today TLDC's, came initially for purposes related to the exploitation, by the world powers, of promising plant taxa. In developing these institutions in the eighteenth, nineteenth and twentieth centuries the world's powerful nations hoped to maintain and expand their political and economic spheres of influence. This is evident in the botanic garden building activities of the British in the Caribbean (Watkins 1966) as well as Southern and Southeastern Asia (Brockway 1979), the French and Belgian activities in Africa (Brockway 1979), the Dutch influence in Southeastern Asia
(Brockway 1979) and the United States' interests in the Caribbean and Central America (Watkins 1966).

As the "national commerce and riches" was being augmented by trade with the colonies and growing home market for tropical products, Britain and the other European powers established many small botanic gardens in the colonies, some of them older than Kew Gardens itself. At first they were not much more than collection stations for tropical plants, but in the nineteenth century some of them . . . became important research centers. (Brockway 1979, 75)

Primarily, the past history of plant exploration and introduction relative to TLDC's was conducted with the intent of being unilaterally beneficial in favor of the colonial powers. These early TLDC institutions served as plant introduction gardens for the world powers (Watkins 1966) and also as bases from which first-world plant explorers could launch their expeditions and as training grounds for their scientists (Brockway 1979).

Even today, it seems logical to legitimize the initiation of unilaterally beneficial plant exploration activities under the guise of economic practicality, efficiency and individual need.
Botanic gardens staff may fail to realize the perceptions of others concerning the growing feelings of natural resources sovereignty, professional equality and mutuality of goals being asserted by many botanic gardens, especially those of TLDC's.

Public gardens are back in the plant collecting business. This is great as long as the participants realize that plant collecting is primarily a service operation, that personal gratification is a spin off, and that there are new rules. Of those new rules, the main one is that most countries are suddenly aware of the value of their genetic resources and many simply do not allow these resources to be taken from them. (Creech 1987, 3)

The issue of whether plant exploration and introductions should even be conducted these days is a highly charged, emotional issue.

Much has also been said about the do's and don'ts of plant collecting with the extremes of opinion being expressed and tempers frayed. On the one hand there are the hard line conservationists who believe that any sort of collecting is a crime while at the other extreme, there are those who seem to think that the plant resources of the world are infinite and are fair game for commercial exploitation, with short-term financial gain as the main aim with no thought of future generations. (Grey-Wilson, Knees and Mathew 1987, 30)
Reality lies somewhere between these two extremes. But at the heart of any endeavor in plant exploration must rest two principles. First, the activities must be bilaterally/multilaterally beneficial to all institutions involved. Second, activities should only be conducted in a way that takes into account the best interest of the plant taxa involved.

Grey-Wilson, Knees and Mathew (1987) state that plant exploration exists today in-part to meet the horticultural interests of people in TDC's. Meyer makes a similar point even more closely related to the needs of botanic gardens in TDC's:

Permanent living collections are central to most botanic gardens, and appropriate investments in new plantings are necessary to insure the viability of the living collections for future generations. (1987, 8)

Other reasons stated for the current existence of plant exploration focus on concepts such as the need for wild collected plants for research purposes (Grey-Wilson, Knees and Mathew 1987) as well as staff training and public relations purposes (Meyer 1987). These stated purposes for a continuance of plant
exploration are still often developed as unilaterally beneficial activities in that they are designed to serve the immediate concerns of botanic gardens in TDC's. The activities are not illegitimate, they are incomplete and they do not insure a mutuality of benefits for botanic gardens in TLDC's.

If true international cooperation among botanic gardens is to be realized in the realm of plant exploration and introduction, certain conditions must be built into the activities by all concerned.

Whenever possible, efforts must be taken to conduct joint exploration activities with institutions in the nations where plant hunting is to take place. This task would not be impossible since Heywood (1987) mentions the existence of over 1,400 botanic gardens, arboreta, similar institutions and related authorities located throughout the entire world. Efforts must be made to attach counterparts, from any visited nation, to a plant hunting project. It needs to be realized that one of the real benefits of plant exploration is the professional and personal
linkages that could develop among cooperating members and their respective institutions. To simply visit with institutions in the nation hosting the plant exploration, for purposes of protocol, is quite inadequate; a greater involvement is needed by all concerned. Furthermore, linkages serve the purpose of providing easy and sustained dialogue between scientists, relating to future needs that may occur concerning any plant taxa in question.

To conduct activities of plant exploration without regard for the conservation of the collected taxa is at best foolhardy and at worst exploitative and possibly destructive to the collected taxa. Plant exploration activities should include provisions for the long-term conservation of any taxa. Both in situ and ex situ conservation activities are practically impossible for one institution to conduct alone. The coordination of plant exploration activities resulting in a sharing among institutions of the subsequent benefits and the sharing of conservation responsibilities is critical if mutual, long-term gains are to be derived. This holds true not only for the establishment of a
practical worldwide conservation strategy, but also for the cost effectiveness of conducting the increasingly expensive activities of plant exploration.

Since plant exploration is somewhat of a national [and international] effort, we might follow the example of our crops colleagues in identifying priority needs and coordinating our efforts. Today with stringent quarantine regulations, the restrictions imposed by governments on taking out plant material, the high cost of travel and the diversity of ideas as to where to collect, it is time for public gardens to develop a coordinated approach to plant exploration. (Creech 1987, 3)

An important means of obtaining plants, without sending explorers, involves the international exchange of plant materials among cooperating institutions.

In 1849 Ellsworth's [the Commissioner of the Patent Office of the U.S. Department of State, in charge of plant materials distribution] successor mentions a Frenchman by the name of Vattemare as the founder of the international exchange system, and one who gave most of the seed distributed by the Patent Office in 1848. This international exchange system has become one of the most important methods of plant introduction. (Ryerson 1966, 3)
The development of national germplasm collections in botanic gardens (Thibodeau 1987) and expanding this concept to an international scale can go far in not only serving a conservation function but also in providing for a ready source of plant resources for exchange and a system by which exchanges can take place.

An excellent pattern for the world's botanic gardens to follow is one that is used for germplasm conservation in select crop plants by the International Board for Plant Genetic Resources (IBPGR). The IBPGR has developed a series of directories of important plant taxa under its aegis and located at various places throughout the world. These directories include information about the conserved taxa; institutions responsible for their conservation, contact names, provenance information, quarantine and legal restrictions and information concerning plant exchange procedures.

The concept of developing worldwide botanic garden networks oriented to various forms of cooperation ranging from
germplasm collection and exchange through seed exchanges and
herbarium exchanges is a central theme in this thesis.

National coordinating bodies for various botanic garden
activities already exist in some nations. International bodies such
as the International Union for Conservation of Nature and Natural
Resources (IUCN) and the International Association of Botanical
Gardens (IABG) can be called upon to oversee attempts at
coordinating worldwide plant exchange activities (Heywood 1984)
and (van Vliet 1984).

Winters (1966) states that institutions in need of plants are most effectively served if they do the collecting themselves. In some cases this is true, especially when an institution in need of certain taxa can not be confident of the source supplying the plants or the genetic purity of plant materials obtained through a system of exchange (Jury 1984). It is also possible that no cooperating institution can be found in an area from which plants are desired. However, botanic gardens must first make every effort to find cooperating institutions in regions where needed.
plant taxa are located. It is important that working agreements be established among cooperating institutions and that it be impressed on the cooperators that detail and accuracy are important with respect to plant exchanges.

Conducting plant exploration activities without the cooperation of a host country botanic garden can be unproductive and frustrating. As foreigners on a plant hunting trip, botanic garden professionals may be unaware of local factors such as the climate, spelling possible disaster. For example:

... we were abruptly aroused by a disturbing rumble of water; the stream below was in an uproar. Anxiously we lay there dreading that all our plants were washing away in the rampage of this unexpected runoff of a stream in the distant Andes. (Besse 1987, 18)

Cooperating with host country botanic gardens can and should include the use of appropriate equipment provided as a convenience by the hosting institution. This equipment can be of great service to plant exploration, avoiding the hazards of sub-standard equipment.
The rental vehicles can be aggravating: a leaky radiator that requires filling at every other stream; a tire jack so feeble that the truck must be unloaded to use it . . . ; a dripping gas tank kept plugged with chewing gum and duct tape. (Besse 1987, 19)

By cooperating with local institutions the benefits and help of those who intimately know the local geographic areas are made available.

I have been completely lost just once, and it was frightening. On mountainous terrain it is easy to keep a sense of direction, though an error can be made by going off the wrong side of a ridge. But flat country is deceptive, especially when the sun goes in, and it is easy to become confused even a few feet from a trail. (Besse 1987, 19)

There are also legal matters to consider when seeking to export plants from a host nation.

Perhaps the most tedious task of a trip is obtaining the permit required by the International Endangered Species Act [CITES] to bring endangered species into the United States. Once we arrive in a country such as Ecuador we call at the forestry office for the permit application form on which we must describe the intent of our travel, nature of project, and our institution as well as provide the curriculum vitae and photographs of collectors and explain what we are going to collect and how many . . . . There are
delays and repeat visits, but the permit invariably materializes at the last hour. (Besse 1987, 20)

Many frustrations can be greatly reduced if close cooperating relationships are pursued and cultivated with botanic garden counterparts in hosting nations. One of their responsibilities can be to take the time to anticipate difficulties, making all needed arrangements in ways that they feel are locally expedient and culturally correct. TDC botanic gardens may also encounter some difficulties in importing plant taxa back to their nations. Quarantine laws (Kahn 1966) and (Winters 1966), importation permits (Campbell 1987) all need to be researched and considered. An excellent place to start in the United States of America, would be with the Agricultural Research Service (ARS), United States Department of Agriculture, Beltsville, Maryland.

Besse (1987) describes problems involving delays at military checkpoints, arrests for visa misunderstandings, etc. Many of these problems can be greatly reduced if preparations and long-term commitments are made with botanic gardens in other nations for the purpose of mutually beneficial cooperation.
Cooperation does not automatically spell easy or instant success. It is something that requires commitment and vision. Moreover, international cooperation for purposes of plant exploration and introduction is becoming an important professional, practical and moral necessity.

It is quite clear that if things continue as they are then the most likely outcome is that countries will impose a total ban on collecting plants from the wild. (Grey-Wilson, Knees and Mathew 1987, 34)

2. Dry Plant and Related Materials Exchanges

A considerable amount of plant material shared by the world community is exchanged in a form other than fresh. This section of the chapter looks at the various forms of cooperation involving exchanges of seeds, the sharing of Indices Seminum (seed lists) and the establishment of mutually beneficial seed banks for facilitating seed sharing and the long-term storage of seeds. This section also takes an extensive look at the cooperation that occurs among the world's herbaria, entities oftentimes considered an integral part of the operation of a
a. Seeds, Seed Lists and Seed Banks. Perhaps one of the most common forms of international cooperation currently existing among botanic gardens is the exchange of \textit{Indices Seminum} and seeds. "The \textit{Index Seminum} that each garden sends out yearly forms, of course, a good example of international cooperation" (van Vliet 1984, 48). A survey into international cooperation that I recently conducted involving 300 botanic gardens worldwide (Appendix A, page 172) indicates that of those institutions responding, 72% include the exchange of \textit{Indices Seminum} as at least one form of cooperation.

It is difficult to say when botanic gardens initially began exchanging their \textit{Indices Seminum}. It is, no doubt, a very old phenomenon, going back to the late 1700's with developments in Greifswald, Germany in 1773 and Copenhagen, Denmark in 1797 (Jury 1984). Most of the world's old, prominent botanic gardens developed an \textit{Index Seminum} by no later than the early 1800's (Jury 1984).
The exchange of seeds for purposes of growing plants for horticultural display, conservation and research is an extremely important, cost efficient tool for use by botanic gardens. This method of exchanging plant material, if done conscientiously and correctly, is a sound method of insuring the in situ survival of taxa by removing pressures for collecting wild plant species. Seed exchange also facilitates the ex situ maintenance of plant taxa by disseminating genetic material to a number of sites. At a time when world pressure is increasing for a restriction of international movement of plant taxa, as is evident by international agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), seed transportation is still an acceptable means of obtaining any needed plant materials. Furthermore, the exchange of seeds among the world's botanic gardens provides for an easy and relatively safe means of transporting desired plant resources. "Seed is a convenient vehicle for exchange and most institutions rely on this
method particularly as most diseases are not seed transmitted" (Jury 1984, 57).

An institution's *Index Seminum* is particularly useful to botanic gardens of other nations if they offer well documented seeds of native origin. To this end Jirásek (1983) developed a worldwide list of institutions offering seeds of native origin, indicating the precise nativities of the seeds in question. Jirásek's list was intended primarily for use by members of the International Organization of Biosystematists (IOB), now known as the International Organization of Plant Biosystematists (IOPB), and any other specialists in need of such material.

It [the Jirásek list] is designed for the use of biosystematists, cytotaxonomists, phytogeneticists, experimental plant taxonomists, plant breeders, classical plant systematists and other specialists in botany whose research work requires seeds collected from indigenous plants growing in their natural habitats. For these specialists, free access to such seeds is of the utmost importance. (Jirásek 1983, 584)

Jirásek's list includes 342 botanic gardens located in 54 nations including many tropical, TLDC's. This is not a complete
listing of botanic gardens which distribute an Index Seminum, rather, it refers to those known institutions who offer seeds collected from plants of indigenous habitats. Jirásek recommends that the IABG initiate a more complete listing of botanic gardens offering Indices Seminum (1983). Such an initiative is already a part of the IABG's "International Directory of Botanical Gardens IV" (Henderson 1983). This directory, which lists over 1,000 institutions in about 90 nations, includes basic institutional data as well as information concerning specializations in plant collections, the various institutional publications including an Index Seminum if available, etc.

Considerable dialogue is needed among botanic gardens concerning ways of improving their Indices Seminum and the quality of seeds listed. At stake should be the mutual, future needs of institutions worldwide. A major difficulty that botanic gardens need to address concerns the origins of plants from which seeds are provided for international exchange.

Over 40% of lists [Indices Seminum surveyed by Jury] contain only seeds of plants of unknown origin. Of the
remainder, often only the provenance is given, sometimes just the latitude and longitude! The latter is not particularly helpful, but does at least allow a spot to be placed on a map, and the variability placed in its geographic context.

Seed collected from a plant cultivated in a botanic garden may have arisen from hybridization with geographically unrelated taxa. We mark seed collected in the wild with an asterisk to separate it from possibly less-useful garden harvested [seeds].

There is a tendency for many Indices Seminum to be composed of commonly cultivated plants without origin, and there is an appreciable amount of plant material which simply goes round and round the botanic garden circuit! There is no need for large numbers of institutions to offer all the same unlocalized taxa. (Jury 1984, 58)

Such difficulties have, unfortunately, resulted in some institutions abstaining from becoming a part of the important network of international cooperation among botanic gardens through seed exchange.

Because of the promiscuity of plants in cultivation, we [Durham University Botanic Garden, Durham, United Kingdom] try to avoid seed from this source, unless we can be quite sure that the plant has behaved itself properly. For the same reason we do not circulate a seed list. We send out from time to time a list of surplus seedlings noting their source. (Maudsley 1983 (?), 9)
To counter these and similar difficulties, considerable heed should be paid to the writings of Howard et al. (1964) as well as Heywood (1964) concerning the ideal format and use of seed lists by botanic gardens.

The importance of an international seed exchange program can be seen in an example concerning conservation attempts in The Netherlands with the Betulaceae.

In the mutual arrangements on 'centres of gravity' the Botanic Gardens of Utrecht University became responsible for the Betulaceae. In 1978 a start was made with demands for seeds of natural sources both from seed lists of Botanic Gardens as well as by direct requests to gardens and other sources in several countries within the area of the genus. The intention was to obtain seeds if possible from a number of provenances for each species, especially of variable species. (de Jong 1984, 3)

Likewise, one of the main tenets of a bilateral agreement on the environment, signed in 1972 between the United States of America (USA) and the Union of Soviet Socialist Republics (USSR), was oriented towards the exchange of seeds for a variety of
horticultural and botanical purposes.

Seeds from some of the species were brought to the USSR and the USA for the first time. They considerably enriched the collections of the botanic gardens in these countries and made it possible to build up a gene-pool of rare and endangered species. Seed material of wild fruits, caryocarpous and berry plants collected in different phytocenotic and ecological conditions of the USA were collected. They are valuable for future selective work. (Lapin 1984, 23)

Two additional points regarding seeds and international cooperation are the development of internationally oriented seed banks for purposes of ex situ plant conservation and the establishment of international seed centers to function as clearinghouses of information while simultaneously fostering seed exchanges.

An important long-term goal [of the IUCN - Botanic Gardens Conservation Secretariat] will be to secure effective long-term storage in seed-banks for all threatened species that do not have recalcitrant seeds. It is hoped to do this in close collaboration with the International Board of Plant Genetic Resources (IBPGR), who coordinate the existing network of seed banks for crop plants. The Royal Botanic Gardens, Kew, have offered extensive help
It is critical, therefore, that botanic gardens cooperate with each other with regards to the development and utilization of seed banks and with institutions in allied fields that have established seed banks and show similar plant interests. The goal would be the sharing of existing facilities (Heywood 1984, 38).

As with other methods of conservation, seed banks are developing rapidly. There is very little international communication and coordination among these institutions with regards to plant conservation resulting in an unnecessary overlap of efforts (Hamann, Leon and Synge 1984). To be fully effective, greater international contact between these institutions needs to be implemented.

Finally, the development of international seed centers that foster communication and seed exchange among the world's botanic gardens needs to be addressed. Though still uncommon in
the botanic gardens field, the concept of seed centers is commonly found in the allied disciplines of agriculture and forestry.

According to Keiding (1987) the Hørsholm Arboretum, Hørsholm, Denmark in conjunction with the Danish International Development Agency (DANIDA) Forest Seed Center in Humlebæk, Denmark have cooperated with other Nordic groups in a venture to facilitate the acquisition, short term storage and exchange of forest seed material among institutions from a variety of nations.

Generic documents of agreement spell out the provisions of cooperation. The benefits of international seed exchange using such seed centers seems obvious. Such organizations provide advocacy initiatives concerning the acquisition of seeds of desirable taxa. There is also considerable effort put forward in determining the exact origins of collected materials utilizing the provenance system so common and well developed in the field of forestry.
As stated by Keiding (1987), the Danish institutions act as mediators and waystations concerning seed exchanges. The organization helps other nations establish similar centers with the hope that this will foster further cooperation. Considerable care is taken to act with diplomacy concerning matters of sovereignty over plant materials, laws, cultures, etc. Cooperation in this, and other respects, is not an easy matter. "Regional or global networking is a popular idea, but convincing individual nations [to participate] is tough" (Keiding 1987).

Botanic gardens need to collectively explore the possibility of establishing such seed centers worldwide to better serve their specific institutional needs.

b. Cooperation among Herbaria. One of the professional responsibilities usually undertaken by botanic gardens is the establishment and maintenance of an herbarium (Ern 1987a). The history of bilateral and multilateral cooperation among herbaria and their respective institutions shows that this cooperation is indeed an early and important form of international
exchange and dialogue. In my survey on international cooperation, 38% of the respondents claim herbarium materials exchanges as at least one form of cooperation. The "Index Herbariorum I" (Holmgren, Keuken and Schofield 1981), a worldwide directory listing herbaria and the composition of their respective collections, associated institutions, loan information, exchange policies, etc. was published in 1952 and in 1954 the "Index Herbariorum II" (Lanjouw and Stafleu 1954), a listing of prominent collectors associated with herbaria worldwide was published. With the exception of the exchange of Indices Seminum, these directories precede much of the other current efforts done with respect to international cooperation among botanic gardens.

Holmgren, Keuken and Schofield (1981) list, in their directory, approximately 2,000 herbaria in about 160 nations. This is one of the widest networks of international cooperation among botanic gardens on record. It provides botanic gardens with a foundation for developing greater institutional cooperation at both the herbarium and non-herbarium levels.
An example of the potential for international cooperation concerning herbaria can be seen in a joint USA/USSR effort, signed in 1972, oriented towards the exchange of plant materials, botanical information and personnel. Designed as a venture in which the two nations could learn more about the exotic and endangered plant species of each respective nation, this ongoing collaborative agreement has relied heavily on herbaria development as a tenet of cooperation.

Herbaria were considerably enriched with rare and endemic specimens from vast regions of North America and the USSR. The collected herbaria made it possible to document all the material for introduction and increased its scientific value. The first expeditions to rich floristic regions in the USA and USSR showed the prospects of their use for further introduction to both countries. Suffice it to say that 663 living plant specimens, 2409 seed samples and 16,500 herbarium sheets were brought from the USA to the USSR. (Lapin 1984b, 23)

This in no way implies that cooperation among herbaria is trouble-free. As Morin and Crosby (1983) explain, there have been difficulties encountered in the past involving transactions between herbaria in the USA and nations in Latin America.
... there seems to be three main categories of shipments [concerning herbarium specimens] that pose potential problems: sending material requested (loans), sending material unrequested (exchange, gift), and receiving material (institutional collections, exchange, loans). (Morin and Crosby 1983,1)

Generally, the outright loss of transacted material is not a problem. Delays in transit time, postal mishandling and improper package addressing make up the bulk of the difficulties encountered. CITES makes special provisions for the transaction of herbarium specimens, allowing this material to cross political boundaries unencumbered by rules that affect certain live plant taxa. A greater understanding and compliance with the provisions of CITES, as well as stronger links to foreign botanic gardens, have the potential for making cooperation among herbaria a much more profitable and pleasant experience.

Close international cooperation among foreign institutions and their herbaria can help in alleviating potential logistic and legal problems associated with collecting specimens for herbarium use. This is especially true when dealings occur
between nations where cultures, languages and bureaucracies pose potential barriers to cooperation. Cooperation among herbaria can indeed help foster botanically related efforts and also the mutual exchange of basic information and techniques as well as an opportunity to assist in general institution building and the development of strong relationships among staff members at respective institutions.

Workers from universities or scientific institutions traveling to foreign countries may be asked to collect specimens for either herbaria in their own institutions or other national herbaria in the country of residence. Often this can mean that the herbarium will supply collecting equipment to the worker. However, no obligation to such an institution should take precedence over the requirements of the host country in which the field work is being carried out. Failure to comply with these requirements can result in difficulties or in outright refusal of permission to carry out the intended field work. Such consequences can affect both yourself and others who may want to follow. (Womersley 1981, xi)

Herbaria in many countries are not well endowed financially. If you are the recipient of assistance, offer to pay for the service provided. If this is declined, as is often the case, you could provide some piece of equipment, books for the library, or even such mundane things as some new cups and saucers for the staff room. (Womersley 1981, xi)
One final note concerning international cooperation among the herbaria of botanic gardens is the potential for cooperation that exists when institutions develop computer capabilities. Though relatively expensive, especially for institutions in TLDC's, computers can greatly assist in welding the world's many herbaria into one solid, cooperating system by making the location and contents of herbarium collections readily available to inquiring scientists. Though not without start-up problems, such systems have already been initiated, to varying degrees, as intranational and international efforts in several of the richer nations (Brenan, Ross and Williams 1975).

3. The Influence of Laws and Policies

As the echoes of the twelfth stroke fell [midnight, 15 August 1947] a toneless shriek reverberated through the hall from the figure poised in the gallery, a primitive call from across Nehru's trackless centuries. To those Indian politicians the conch shell's bleat heralded the birth of their nation. To the world, it played retreat for the passage of an age. (Collins and Lapierre 1975, 292-293)
With independence coming to India, a systematic disassembly of world colonialism was inevitable. Though political and economic control of one nation by another is still prevalent today, it is becoming increasingly popular for a nation to exercise control over its own affairs. These attitudes, demanding self determination and activities that require a mutuality of derived benefits, have filtered down within nations to affect the functioning of their institutions, including botanic gardens.

One important policy that affects the nature of international cooperation among botanic gardens is CITES. The second deals with the concept of a nation's right to exercise sovereignty over its own natural resources.

**a. CITES.** One of the most influential of international agreements currently practiced with respect to plants is CITES (See Appendix B, page 215). Designed with the purpose of regulating commercial trade in wild, endangered animal and plant species, CITES has already had considerable impact on the process by which botanic gardens can acquire plants to which CITES
protection has been extended. A large number of the plants that form the mainstay of botanic garden collections are currently covered by CITES.

The plants covered by CITES are mainly those which are collected from the wild for horticulture. All cacti, cycads, orchids, and cyclamen are covered, together with certain other succulents and insectivorous plants. (Oldfield 1986, 12)

Initially proposed by the IUCN in 1973 and coming into effect in 1975, CITES currently has 97 (See Appendix B, page 215) signatory nations (Department of State 1987). The convention is signed by the representatives of respective heads of state. Through attendance and lobbying efforts at each of the CITES meetings, commercial enterprise and environmentalists alike have their issues heard and debated regarding the effect of CITES on their respective interests. However, the botanic garden community is usually lightly represented (Campbell 1987).

Every year additional species, genera and plant families are extended trade protection of one sort or another under the provisions of CITES. Backed by enabling legislation from each
signatory nation, such as the Endangered Species Act of 1973 for the USA, botanic gardens are finding it increasingly difficult to obtain plant specimens from the wild. Section 2, Paragraph (4) of this Act makes specific reference to the United States' pledge to help enforce the provisions of not only CITES but other related international accords as well.

The Congress finds and declares that the United States has pledged itself as a sovereign state in the international community to conserve to the extent practical the various species of fish or wildlife and plants facing extinction, pursuant to:

(A) migratory bird treaties with Canada and Mexico;

(B) the Migratory and Endangered Bird Treaty with Japan;

(C) the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere;

(D) the International Convention for the Northwest Atlantic Fisheries;

(E) the International Convention for the High Seas Fisheries of the North Pacific Ocean;

(F) the Convention on International Trade in Endangered Species of Wild Fauna and Flora; and

(G) other international agreements. (Endangered Species Act 1973)
There are three appendices which form the core of CITES. In these appendices are listed the taxa to be extended some form of protection as well as the procedures required for legally obtaining any protected taxa for purposes exempt from CITES controls. Koopowitz and Kaye explain as follows:

Appendix 1 contains critically threatened species or genera. Transport of any specimen from this list requires two permits - one permit to export the plant from any country and another to import it into the recipient country. Specimens can be moved only if removal will not jeopardize the survival of the species. (Koopowitz and Kaye 1983, 203)

Appendix 2 lists species, whole genera, and even entire families of plants that are not as seriously troubled as the plants on Appendix 1. Substantial trade of the plants on Appendix 2 could result in the plant's being driven toward extinction. This list also includes plants which are not threatened but which resemble plants that are. For some groups, such as orchids or cacti, only an expert could distinguish the endangered species. Blanket protection is therefore given to several entire families. Only export permits are needed for plants listed on Appendix 2. (Koopowitz and Kaye 1983, 203)

Some plants are rare in one country but fairly common in others. Appendix 3 lists these plants and allows countries the option of restricting trade in those species. (Koopowitz and Kaye 1983, 203)
Appendix C (found on page 245) is a listing of those plant taxa included in appendices 1 and 2 of CITES, current to September 1987.

Article VII, paragraph 6 of CITES permits the exchange of protected taxa from wild sources in special circumstances. According to Campbell (1987) this exemption was intended to facilitate the easy exchange of herbarium specimens between scientists and scientific institutions of various nations. As written however, this exemption covers live plants and plant parts. There can also be little question that botanic gardens qualify as scientific institutions and are therefore qualified to at least request CITES protected plants assuming the exchange is non-commercial and conducted procedurally as mandated by CITES. Article VII, paragraph 6 of CITES makes the following point:

The provision of Articles III, IV and V shall not apply to the non-commercial loan, donation or exchange between scientists or scientific institutions registered by a Management Authority of their State, of herbarium specimens, other preserves, dried or
embedded museum specimens, and live plant material which carry a label issued or approved by a Management Authority. (Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973)

Given the ever increasing authority and complexity of CITES and the growing concern for plant conservation, it is evident that botanic gardens need to cooperate internationally so as to have their current and future plant needs satisfactorily met.

As Article VII, paragraph 6 of CITES states, the provisions of the convention permit the exchange of plants among scientific institutions for non-commercial purposes. The provisions of CITES state that the exchange of wild plants must in no way be detrimental to wild populations and should further the conservation cause of these taxa. By cooperating internationally, botanic gardens can establish mutually beneficial plans for plant exchanges and conservation. Mutually agreed upon directives help convince the trade-permit issuing agencies, known as Management Authorities, of the validity, safety and benefits of any proposed plant exchanges. It should be noted here
that in the United States the designated Management Authority is the United States Fish and Wildlife Service, Department of the Interior.

Obtaining CITES mandated trade permits, both export and import, can be a laborious, time consuming and frustrating experience. International cooperation among botanic gardens provides for foreign counterpart institutions that can assist in obtaining any needed export permits. By having a stake in this process and being located relatively close to the permit issuing agency, foreign counterpart botanic gardens are able to troubleshoot problems and actively push for the rapid issuance of any needed permits.

Scientific institutions that qualify for exemption of control under CITES; in essence non-commercial, research institutions, are strongly encouraged to register for exempt status with their nations respective Management Authorities. They are able to more easily transport protected plant materials with only a minimum of bureaucratic delay. To date, botanic
gardens have not taken full advantage of this CITES provision (Campbell 1987).

b. Sovereignty over Natural Resources. There is a feeling in the plant science community that plants are the common heritage of all mankind regardless of where these plants originate. Recently however, there has been a growing movement towards establishing some form of sovereignty over a nation's natural resources. This concept, though still in its infancy, has already been accepted in principle by the United Nations. It is geared to reduce exploitation of the natural resources of TLDC's by TDC's.

The movement for sovereignty over natural resources surfaced in 1952. At the seventh session of the United Nations General Assembly, the delegation from Uruguay proposed a resolution (A/C. 2/L. 165 and Corr. 1-3) which states the following.

... that the United Nations should recommend that member states respect the right of each country to nationalize and freely exploit their natural wealth as
an essential factor of economic independence. (Rajan 1978, 15)

This concept of natural resources sovereignty was discussed in the United Nations for many years and in 1974 in the Declaration of the Establishment of a New International Economic Order [resolution 3201 (S-VI), paragraph 4] it was proposed that recognition be made for "full permanent sovereignty of every state over the natural resources and economic activities (of that state)..." (Rajan 1978, 35). Furthermore, that ". . . no state may be subjected to economic, political or any other type of coercion to prevent the free and full exercise of this inalienable right" (Rajan 1978, 35).

Though opposed by factions in TDC's, the principle of natural resources sovereignty has been warmly embraced by many in TLDC's. The Ghanaian representative to the United Nations spoke for many in TLDC's as follows:

The poverty of most developing countries was due . . . not to their lack of resources, but rather to the prolonged, unilateral exploitation of their natural resources by foreign companies . . . . (Rajan 1978, 47)
Though primarily oriented to natural resources of industrial value, namely geological products, the principles of permanent sovereignty over natural resources has direct implications for current and future activities involving botanic gardens. Of the approximately 300,000 plant species growing in the world, the preponderance of taxa can be found in TLDC's. Ninety thousand (90,000) plant species are growing in Latin America (Leiva-Sanchez 1987). Lapin (1984b) points out that Southeast Asia has 25,000 species with an additional 30,000 species in Africa. Other technologically lesser developed regions have yet other species not counted above. According to the Botanic Gardens Conservation Secretariat of the IUCN about 70,000 species of plants are found growing in the TDC's and the USSR (International Union for Conservation of Nature and Natural Resources 1987). In essence, with roughly three-fourths of the world's plant species concentrated in TLDC's, the botanic gardens in the richer nations seem to be in a position of dependence on poorer nations for a continued supply of exotic plant resources.
Eloff draws the connection for us between the concept of a nation's right to permanent sovereignty over its natural resources and botanic gardens by stating that "the third-world [TLDC's] should not let their germplasm go away for free. In the past it has been a one way street, but it should not be such in the future" (1987).

Evidence concerning a nation's exercise of its right of sovereignty over plant resources already effects the botanic garden community (Keiding 1987). Recently, the People's Republic of China has been very reluctant to permit the wholesale acquisition of rare plants by collectors. Keiding (1987) goes on to state that the Chinese government now wants full control over material collected in their nation, oftentimes collecting and distributing material themselves.

Since plants are the mainstay of botanic gardens, it seems that new directives shall be guiding us in future international ventures related to plants. It would be a mistake for the botanic gardens in TDC's to continue any unilaterally
beneficial activities. It would also be a mistake for institutions and governments in TLDC's to begin a policy of withholding plant resources from the entire human community or even worse, demanding some short sighted form of economic return in exchange for plants.

Plant resources should not be taken unilaterally, they should be given conditionally. Naturally-occurring plant resources should neither be bought nor sold, rather, mutually beneficial agreements for the development of plant resources should be entered into among botanic gardens. Though short-term goals need to be satisfied, long-term issues are really more critical.

C. Plant Conservation and Botanic Gardens

Botanic gardens are expected to play an important central role in plant conservation (Hamann, Leon and Synge 1984). This occurs because of a feeling that botanic gardens are among the most qualified and prepared to address issues that could leave mankind poorer because of a loss of thousands of plant taxa.
Botanic gardens have superb skills with which to achieve conservation:

1. Taxonomic expertise and field knowledge to classify plants and identify which are threatened. They can also assess which are the sites where most plants can be saved. Basic research into plant taxonomy and distribution is itself a vital contribution to conserving habitats.

2. Ecological expertise to study and monitor rare plants in their habitats and plan their conservation.

3. Horticultural expertise, to propagate and maintain threatened plants in cultivation and to 'garden' in the habitat, hence saving critically endangered plants. (Hamann, Leon and Synge 1984, 26)

Hamann, Leon and Synge (1984) also argue that botanic garden administrators are turning more and more to a conservation philosophy as one means of justifying their continued operation.

Thirty percent (30%) of those botanic gardens responding to the survey on international cooperation (Appendix A, page 172) list plant conservation as a reason for their cooperation endeavors.
Effective plant conservation can best be conducted by the establishment of national, regional and international networks of cooperation among botanic gardens. Such cooperation is important given the impossibility of effective, complete coverage of taxa in need of conservation by lone institutions. Likewise, cooperation is critical because although the preponderance of plant taxa are located in TLDC's, the majority of the world's botanic gardens are in the "more industrialized countries of the world" (Ern 1986, 8).

One possible way of planning patterns of international cooperation among botanic gardens with respect to plant conservation is by looking at and learning from the various intranational models of cooperation that exist. The first part of this section deals with these varied national models. This is followed by another subsection that deals with cooperation among regions and nations.
1. Intranational Cooperation in Global Perspective

Intranational cooperation is defined as the cooperation that occurs among botanic gardens of the same nation. My investigations show that the most significant forms of intranational cooperation occur out of a desire to conserve plant genetic resources. A study of intranational cooperation among botanic gardens is important in understanding the greater potential of international cooperation ventures while laying the groundwork for the same. There is a flaw however in assuming that models of cooperation which function well intranationally will automatically do the same internationally or, for that matter, that successful international ventures can be replicated elsewhere with equal success (Rondinelli 1983). However, since international cooperation among botanic gardens is in many ways still in its infancy, there are few confirmed models to use as patterns for institutions to follow. The cited intranational examples provide botanic gardens with what are, in many cases, the only existing guidelines for cooperation of any sort,
intranationally or internationally. Intranational cooperation does, however, provide us with basic cooperating units that, when linked internationally, can form the basis for a worldwide cooperating network.

Intranational cooperation among botanic gardens is oftentimes a good answer to the problem of maintaining a large collection of potentially valuable plants.

... many scientists ... appreciate the potentialities of a botanic garden and in many of them one may find good research collections. However, when the research is completed, such collections often deteriorate or are dispersed or even destroyed. [This is] a waste of priceless material, efforts and money. First an attempt should be made to maintain these collections on a national level. (van Vliet 1984, 50)

It can be argued that botanic gardens are initially more likely to have a strong interest and stake in establishing ventures of cooperation with institutions in the same nation. International cooperation is oftentimes a natural extension of intranational cooperation. As van Vliet explains, "But if that [maintaining plant collections at a national level] is not possible it should be
attempted on an international level" (1984, 50). Similarities in culture and language, close proximity to each other and common taxa all make intranational ventures of cooperation logical first steps to more complex yet potentially more rewarding ventures of an international nature.

Likewise, intranational ventures are important and worth mentioning here because they provide us with basic models that might be used for international cooperation ventures.

I have located a variety of intranational cooperation ventures occurring primarily in TDC's. Four national models represent much of what is, or has the potential for, occurring elsewhere either nationally or internationally. In order of presentation these national models are in the USSR, the Netherlands, the United Kingdom and the USA. An important concept, common to all four examples, is that cooperation occurs either through or under the aegis of an elected or established central authority. Cooperation occurs not so much between botanic gardens but rather is more directed towards a common
goal. In all cases, this common goal is plant conservation.

Perhaps the earliest documented example of intranational cooperation among botanic gardens can be seen in the USSR.

Co-ordination of the work and co-operation between botanic gardens was first established on a national scale. For example, in 1952 the USSR Botanic Gardens Council was formed; this co-ordinates and methodically directs the activities of all the botanic gardens in every Union Republic, irrespective of their departmental affiliation. (Lapin 1984b, 17)

The USSR's Botanic Gardens Council (UBGC) was established as a means of optimizing the limited human and economic resources available to Soviet botanic gardens. The purpose of the UBGC goes beyond the fostering of communications between Soviet botanic gardens belonging to different departments and institutions. This organization's mission is the reduction of duplication of efforts, the coordination of complex research projects and the establishment of a collaborative information retrieval system concerning plant accessions (Lapin 1984a).
There has been a tremendous effort underway during the last thirty years in the USSR to open and explore new territories. Botanic gardens have been built in many of these new areas of colonization, increasing from sixty gardens some thirty years ago to about 120 today (Lapin 1984a). The UBGC has made plant conservation a prime goal and has proposed a division of labor to be followed by botanic gardens for the efficient ex situ conservation of live plant collections (Lapin 1984a).

A general concern among botanic gardens staff of the principle of cooperation, be it intranational or international, is that such cooperation may in some way dilute the identity and challenge the independence of individual botanic gardens. Dr. Peter Lapin of the Main Botanic Garden in Moscow addresses this concern quite well:

Garden unification . . . was not intended to limit the activities of a Garden, nor to restrict individual initiatives. Each Garden participating in a joint collaborative research project of a complex nature would retain its own identity in terms of departmental allegiances, the natural conditions of its regions and the traditions of its staff. (Lapin 1984a, 3)
It can be argued that cooperation in the USSR is really international in nature since the Soviet Union is a federation of fifteen republics, several autonomous republics, numerous autonomous regions, etc. However, given the strong, top-down paradigm of government present in the Soviet Union today, it is probably most logical to consider intra-Soviet cooperation as being more closely associated with an intranational model. Hamann, Leon and Synge puts things in perspective by stating that the botanic gardens in the USSR "collaborate as a block" (1984, 26) when it comes to matters of an international nature.

It should be noted that because of the vastness of physical distances between the UBGC central office, headquartered in Moscow, and the various botanic gardens in the Soviet Union, "Regional Botanic Gardens Councils" (Lapin 1984a, 3) have been established in an effort to at least partly decentralize the decision making process.
In the Netherlands, intranational cooperation started in 1977 with the computerization and sharing of plant collections data not only intranationally but internationally as well with the botanic gardens in Belgium (de Jong, van Vliet and Wijands 1983 (?)). The purpose of this effort was to illustrate the large degree of duplication of taxa that exists in the collections of botanic gardens within a single nation or limited region. The result has been the establishment of botanical "centers of gravity" (de Jong, van Vliet and Wijands 1983 (?), 6), namely arrangements whereby certain botanic gardens are entrusted with the responsibility of conserving designated taxa. As an example, it was mutually agreed upon by the botanic gardens in the Netherlands that the botanic garden of Utrecht University would take responsibility for conservation efforts of the Betulaceae (de Jong 1984).

Currently in the Netherlands there is a continued effort towards "Decentralized National Plant Collections" (de Jong, Lukkien and Tolsma 1986). This policy is in adherence to section 2, paragraph 4 of a resolution (Appendix D, page 252) agreed upon
by botanic gardens attending the Conference on The Practical Role of Botanic Gardens in the Conservation of Rare and Threatened Plants, held at the Royal Botanic Gardens, Kew, England 11-17 September 1978. The participating botanic gardens agreed:

To co-ordinate on a continuing basis information on specialist holdings in botanic gardens, with the aim of reducing excessive duplication, of making best use of existing collections and stimulating special collections on a wide range of taxonomic groups both in seed banks and traditional cultivation. (Synge and Townsend 1979, 6)

This has resulted in the publication of a comprehensive Catalogue of Plant Collection (de Jong, Lukkien and Tolsma 1986) for distribution not only in the Netherlands but internationally as well. This catalogue lists the plant families being collected, their respective locations within the Netherlands, the purpose of the collection, ongoing efforts of cooperation, available publications concerning the collections, etc.

Intranational cooperation in botanic garden plant conservation was formally discussed in the United Kingdom in September of 1983 at a conference held in Cambridge. Sixteen
botanic gardens were represented at this conference. An agreement was reached that stated the following:

... [the agreement] suggested that the holding of 'insurance' stocks of rare species was in many cases best carried out by seed storage. Proper facilities were thought to be beyond the means of most gardens; the role of the Kew National Seed Bank and other seed banks was discussed. (Ward 1983, 7)

However, as early as 1981, the Royal Horticultural Society had set up the National Council for the Conservation of Plants and Gardens (NCCPG) oriented to preserving those plants of horticultural interest. Over 300 national collections are recognized by the NCCPG, not only in botanic gardens but also in commercial nurseries and in the hands of private collectors. To be recognized, a collection must be well documented and available, whenever possible, for exchange with scientific establishments (Pattison 1987). An example of three national collections can be seen at the Harlow Car Gardens, Harrogate, England where three genera of plants, Calluna, Erica and Daboecia are entrusted for conservation (Swindells 1985).
In 1984, responding to an increasing need for the coordinated ex situ conservation of North American flora, eleven botanic gardens in the United States formed the nucleus of a "U.S. Center for Plant Conservation" (Thibodeau and Falk 1986, 17). With eighteen member botanic gardens currently participating in the national conservation work, the Center for Plant Conservation has identified five main tasks that it proposes to address. According to Thibodeau and Falk, these are as follows:

1) the establishment of a consortium of botanical gardens and other institutions with the geographic scope and facilities to conserve endangered U.S. plant species;

2) the development of a data system and species selection system which can help to determine which of the endangered plants are the highest priorities for protection and to maintain an ongoing inventory of plants in cultivation;

3) the establishment of a National Living Collection to be held in participating institutions and seed storage facilities;

4) the development of a public education and public relations program to make both the scientific community and the general public aware of the resources offered by the Center and participating gardens; and
5) the development of a system of financial, intellectual and programmatic support to ensure the coordination of conservation efforts and the permanence of the National Living Collection. (1986, 18).

The Center for Plant Conservation, realizing the need to build linkages with other institutions, has already reached out in various ways to forge cooperative bonds with domestic and international organizations such as the United States Department of Agriculture, the World Wildlife Fund-United States, the Nature Conservancy, the International Union for the Conservation of Nature and Natural Resources, the Smithsonian Institution, etc. (Thibodeau and Falk 1986). According to Thibodeau and Falk (1986) over fifty endangered taxa of native American plants are currently being conserved by member botanic gardens with information being gathered on an added 3,000 taxa of possible conservation interest. Perhaps of greatest importance here is the fact that the International Union for the Conservation of Nature and Natural Resources has "invited the Center to present its program as a model for other countries at an international
It should be mentioned that the four cited national examples are by no means the only instances of recorded intranational cooperation. The main botanic garden of South Africa, at Kirstenbosch, acts as a hub of coordination for the varied, regionally placed botanic gardens of that nation (Hall and Rycroft 1979). Likewise, the French through "an Association of French Conservatories of plant species" (Mangenot 1984, 75) have organized over fifty national institutions ranging from professional societies to nature reserves to botanic gardens for the purpose of "the preservation of plant genotypes . . . scattered all over the French territories including Corsica" (Mangenot 1984, 75). In Australia there is a proposal before the government to establish a network of thirty-nine botanic gardens at a cost of ninety-six million Australian dollars for the purpose of coordinating national efforts in plant conservation, resource sharing, etc. (Morley 1987b). There are other national examples as well.
From all these examples we can see that there are significant efforts underway in some nations towards coordinated intranational cooperation among botanic gardens. It is from these examples that a more inclusive, global strategy can emerge. Such a strategy can be extrapolated for not only plant conservation, but other interests pertinent to botanic gardens as well.

As stated by the IUCN - Botanic Gardens Conservation Secretariat, national networking plays an important role in a more complete international network of Botanic Gardens for plant conservation. They consider one of their prime, initial tasks to be:

[the] Preparation of guidelines for national, regional and international networking. The strategy envisages a large role for national networks and outlines a clear division of labour between national linking bodies and the international Secretariat. The Secretariat will also develop a liaison with the regional chapters of the International Association of Botanic Gardens (IABG). (International Union for Conservation of Nature and Natural Resources 1987, 8)
2. Conservation through international Cooperation

Botanic gardens have a very clear role with respect to plant conservation. As was mentioned earlier, there currently exists, in select nations, fledgling intranational networks of cooperation oriented towards plant conservation of local flora. Individual and national conservation efforts are not enough however. The complex interrelationship of mankind with respect to the surrounding environment dictates a more complete, worldwide effort geared towards plant conservation.

... on a national scale such a type of cooperation [for plant conservation] is very important, needing a link on [an] international level to weld the whole into one solid system. (van Vliet 1984, 49)

Botanic gardens in TDC's may indeed feel that their local, foreseeable needs are being met without cooperating internationally. Indeed, many may feel that they can not afford the expenditures needed for international cooperation. In 1985 the IUCN dealt with this very issue. A conference was held in the Canary Islands on the roles and responsibilities of botanic
gardens with respect to plant conservation. A resulting document, known as "The Canary Declaration", was produced to act as a stimulus and guideline for international cooperation in plant conservation among botanic gardens. This declaration is followed by a series of recommendations, the entire of which are included as Appendix E on page 255.

One of the difficulties encountered because of a lack of international cooperation, and thereby communication, among botanic gardens is the tendency towards the duplication of efforts concerning the plants being grown and conserved in botanic gardens. "Today, gardens are often growing the same species and in many cases the same clones" (Meyer 1987, 6). As Professor Larsen so aptly writes:

... how far we [as botanic gardens] could come if we tried to unite our resources and plan together instead of adopting the present policy where each garden seems just to try to duplicate the species list of all the other gardens. (1984, 10)

By cooperating internationally, botanic gardens can optimize their limited resources by dividing among themselves
the responsibilities of conserving designated plant taxa. By doing so they can maximize the number of species that are extended some measure of conservation protection.

... there is nothing more logical than to divide the responsibilities for certain groups [plant taxa] between the botanic gardens of the world in order to use their resources more effectively, especially as staff time and money have not grown to the same extent [as plant taxa in need of conservation]. (Poppendieck 1984, 43)

Likewise, such cooperation assures the entire botanic garden community of complete coverage of all taxa in need of conservation while providing for a system whereby any institution can easily locate and quickly obtain any needed plant species (Poppendieck 1984, 46).

No single botanic garden can collect and conserve everything. Each cooperating institution should review its own commitment to the process of international cooperation and then, by mutual agreement with other institutions, set an attainable goal for conservation.
On a voluntary basis, a few gardens from different countries decide to dedicate some of their facilities to growing as many species as possible of a given taxon of Orchidaceae or from any other family, obtaining them from wild localities. That taxon can be a section or a . . . genus, a group of threatened plants or a particular ecological unit, and such a group of gardens could be named a specialization ring. The formation of the rings and the choice of taxa should be supervised and co-ordinated by mutual agreement. The participants then start shaping that collection by exchange with and acquisition from other gardens. (van Vliet 1984, 49)

How large a task is the whole process of plant conservation? How much help can be called upon in this endeavor? Again, Professor Larsen attempts to put things into their proper perspective.

At least 800 gardens are listed in the last directory [International Directory of Botanic Gardens IV (Henderson 1983)]. The number of ferns and flowering plants reaches close to 300,000. This gives 365 species to each garden. Of course you may say it makes little sense to calculate in this way, but still it gives an idea of the enormous richness the world possesses in botanic gardens . . . . (1984, 10)

Granted, it is virtually impossible for any one institution, let alone all 800 botanic gardens cited by Professor Larsen, to
fully conserve 365 different species of plants each. World conservation efforts need to focus on the approximately 60,000 plant species that face extinction by the middle of the next century, as predicted by the IUCN. Though the most recent edition of the international botanic gardens directory lists 800 institutions, Heywood (1987) puts the number more currently at 1,400 known botanic gardens, arboreta similar institutions and related organizations. With about 60,000 plants in need of conservation, a more realistic figure of forty to forty-five species could fall under the aegis of each botanic garden for either ex situ or in situ conservation. It would be erroneous to assume that each known botanic garden would either have the ability or interest for getting involved in a worldwide network of plant conservation. The main purpose of the above figures is to show that with some coordinated effort towards cooperation, the problems faced in plant conservation approach manageability.

Worldwide plant conservation efforts require one or more organizations to motivate cooperation and coordinate activities.
In 1978 the IUCN established the Botanic Gardens Conservation Coordinating Body whose responsibility has been described as follows:

... to link botanic gardens in their conservation activities and to keep them in touch with conservation around the world. The 'Body' now has 128 members, plus ... the USSR. (Hamann, Leon and Synge 1984, 26)

One of the main tasks of this organization has been to embark on a study that "would assess the ability and willingness of individual gardens to accept responsibility for certain taxa on behalf of the network" (Hamann, Leon and Synge 1984, 26).

Likewise, the IABG, organized in 1954 to serve the collective needs of the world's botanic gardens, states the following commitments in the objectives of its constitution (included in total as Appendix F, page 267).

[Section 2, Article 3 (a)] To promote international cooperation between Botanic Gardens, Arboreta and other similar Institutes maintaining scientific collections of living plants and between the staffs of such institutes. (Morley 1987a, 6)

[Section 2, Article 3 (e)] To promote and foster the conservation and preservation of rare and/or
endangered plants through their cultivation and by other means within Botanic Gardens, Arboreta and similar Institutes. (Morley 1987a, 6)

International cooperation among botanic gardens should in no way result in any form of control of the mission and traditions of an institution by an outside group. It is important that each garden maintains its individuality and liberty with respect to the remainder of the collection and that is the greatest part . . . . The specializations form a relatively small extra, but will turn out to be an important contribution in terms of the total number of plants cultivated, if handled and coordinated properly. (van Vliet 1984, 50)

The concept of international cooperation among botanic gardens, for purposes of plant conservation, is an achievable goal. It is a possibility not without precedent in the environmental sciences, as demonstrated by colleagues in the zoological sciences.

Plants and animals are both living creatures, our heritage which we should cherish. An international co-operation between zoological gardens was not futuristic (and not all gardens are participating) and resulted in a stud book for breeding. So why should a
a. In Situ and Ex Situ Policies in Cooperation. In dealing with plant conservation, an issue that frequently arises concerns whether it is best to apply plant conservation in an ex situ or in situ fashion. Though this thesis is oriented to international cooperation, ex situ versus in situ conservation is an issue of importance to botanic gardens interested in cooperating internationally and is thus included in this research. Each of these two methods implies varied and creative international cooperation techniques in order to be successfully employed by botanic gardens. Of concern are the roles, responsibilities and benefits associated with internationally cooperating institutions regarding the implementation of either or both forms of conservation.

Initially, it is important to realize that both ex situ and in situ conservation methods are valuable techniques in the efforts to conserve a plant species. It is often asked which of
these two conservation methods is best? The answer to the question really depends on the individual situation of cooperating botanic gardens and the particular needs of a plant species. In designing a program of plant conservation, cooperating institutions need to consider local environmental conditions, local cultural situations, economic and political concerns and the needs, interests and abilities of cooperating institutions with respect to conservation.

It would be ideal if all botanic gardens could accept, under their aegis, the responsibility for the conservation of a limited, select number of endangered plant taxa. Given the limited space available in individual botanic gardens, a realistic means of fulfilling such a global conservation strategy would be by *in situ* conservation whenever and wherever possible. As Goodenough (1986) points out, *in situ* conservation provides for the long-term conservation of a species, the collective goal of cooperating botanic gardens being to study the cultivation and uses of the taxa concerned.
One of the most compelling defenses for *in situ* conservation is a concern for a species' genetic variability. According to Curtis (1984), much of the world's commercially grown coffee is the result of a single plant collected by Dutch explorers in the early 1700's and propagated countless times to produce today's major coffee plantations. Curtis states that this has been, and still is, the history of many of the plants that we currently have in cultivation. It is only now that we are becoming more aware of a need for greater genetic diversity in cultivated plants.

Concerns about genetic diversity are not only found among those dealing with plants of food, fiber and medicinal value but also among those concerned about plants of ornamental value as well.

With some species it is likely that many, if not all, the plants represented in this country [the United States of America] are descended from a single collection. Under such circumstances, these collections do not begin to represent the potential genetic variation capable of expressing differences
in size, habit, flower color, foliage, cold hardiness or adaptability to various environmental stresses. (Meyer 1987, 6)

In situ conservation minimizes the likelihood of narrowing plant genetic diversity. Minimized also is the illusion of conservation and genetic diversity brought about by the mass propagation of a species without consideration for a wide genetic base.

Variability is important rather than mere quantity; in this sense a single genotype propagated a million times by vegetative methods is less valuable than a small but strongly heterozygous population. (Roche and Dourojeanni 1984, 3)

It would be erroneous to assume that botanic gardens alone could obtain and control all the varied parcels of land needed for in situ conservation. Cooperation among botanic gardens is not enough. Rather, the botanic garden community needs to become an active partner in cooperation with other organizations whose orientation may be ecological, economic, zoological, etc. in nature.
In many nations, the development of nature reserves has become a priority. The United Nations Educational, Scientific and Cultural Organization (UNESCO), through its Natural Resources and Environmental Department sponsors and coordinates a worldwide network of biosphere reserves. The program is known as the Man and Biosphere Program (MAB). (Roche and Dourojeanni 1984). Though extinction is part of the natural process of evolution, mankind has been responsible for the inordinate escalation in plant endangerments and extinctions. MAB, with over 250 biosphere reserves in over sixty-five nations, is designed to address this and other related issues.

The MAB Programme is an international programme of research, training and information diffusion aimed at providing the scientific basis and the trained personnel needed to deal with problems related to resource use and conservation and human settlements.

The MAB approach to research emphasizes problem solving, often involving multi-disciplinary teams and field training, which applies a systems approach to understanding the linkages between the natural and human components of environmental management. (United Nations Educational, Scientific and Cultural Organization 1986, 3)
By having issues heard and addressed at UNESCO, botanic gardens can capitalize on an already existing system oriented towards nature conservation. Endangered plant communities can be given some measure of conscious protection under this international network of biosphere reserves.

Botanic gardens that have a stated mandate or interest in the conservation of certain taxa can meet their goals by establishing cooperating agreements with institutions located in regions where the plant taxa to be conserved are growing. Such agreements can go far in alleviating any concerns of detachment by distant botanic gardens with regards to the process of in situ conservation by providing for a local botanic garden partner. For such agreements to be most effective, the botanic garden that is distant to the site should be extended an equal voice with that of the local botanic garden in matters concerning the conservation of any taxa in question.

In situ conservation should by no means imply that a botanic garden, distant to the natural location of conserved taxa,
should not have holdings of protected taxa. Such plants, maintained \textit{ex situ}, are needed for purposes of public display, research, education and as a conservation backup. Likewise, \textit{in situ} conservation can assist such \textit{ex situ} needs by insuring the existence of a ready source of field material to supplement the collections in botanic gardens when needed.

One caveat applies particularly to collection of rare species - \textit{ex situ} (off site) conservation is in no sense a substitute for habitat preservation. Instead, \textit{ex situ} collections compliment \textit{in situ} (on site) efforts by providing material for reintroduction, research, education and display. (Thibodeau 1987, 11)

However, there are numerous occasions when \textit{in situ} conservation is no longer a feasible option. In such a case, botanic gardens need to consider \textit{ex situ} conservation as perhaps the only option.

No doubt, the best way to protect native plants is the foundation of reserves. Natural unbroken communities provide most favourable conditions to maintain a stable composition and the number of populations of single species. In such communities a self-regulating stable equilibrium among single plants of different species exists. This has developed as the result of selection over a period of millions of
years. Any interference in the stable ecological system cannot but leave a trace.

Unfortunately, for obvious reasons, the problem of rare and endangered species conservation cannot be settled in all cases by means of reserves, however well they may be organized.

Localities of many rare species are often scattered, occupy small territories and evidently cannot be included in reserves. It is, therefore, necessary to intensify the introduction of such species and their propagation in botanic gardens. These two methods of conservation of rare and endangered species should not conflict with each other. Lapin 1984b, 16)

In situ conservation is oftentimes doomed to failure in areas of the world where anthropic pressures on land, coupled with poor conservation directives and a complacent public are encountered (Roche and Dourojeanni 1984). According to Lapin, many plant species collected some time ago and currently growing in the collections at botanic gardens have "unfortunately been lost from their native ecological systems" (1984). In such cases, botanic gardens should take up the issue of ex situ conservation with counterpart institutions.

The unparalleled destruction of plant habitats makes this work [conservation] more urgent and
increasingly public gardens will be called upon to be botanical arks for endangered species. (Meyer 1987, 8)

In 1978, the IUCN, by establishing the Botanic Garden Conservation Coordinating Body, was entrusted by select botanic gardens with the responsibility of bringing botanic gardens into closer coordination concerning *ex situ* conservation activities. The goal of this section of the IUCN is to insure that all plant taxa considered threatened are conserved, *ex situ*, in two or three botanic gardens worldwide (Hamann, Leon and Synge 1984).

The number of individual plant specimens, of diverse genetic background, needed for ideal *ex situ* conservation is still a matter of debate and probably somewhat species specific. Frankel and Soule state that:

... several workers have put forward the figure of 50 as the minimum effective population size required for short term fitness and survival and 500 to sustain long-term genetic adaptability to change. (1981)
Thibodeau also provides us with a somewhat similar opinion:

Under a wide variety of assumptions, a random sample drawn from 50-100 individuals will be 95 percent certain of obtaining at least one copy of each common allele (frequency > 0.05). Theoretically, 50-100 plants capture almost all of the genetic information necessary to 'rebuild' a species. (1987, 11-12)

International cooperation among botanic gardens should be encouraged as a means of obtaining, maintaining and replenishing plant taxa conserved *ex situ*. In cases where it is impossible for a single botanic garden to individually maintain the necessary number of individual plants needed for ideal genetic diversity, agreements to share the responsibilities can be developed among two or more institutions. In such cases where botanic gardens hold a limited number of individuals of a given taxon, scientists from cooperating institutions responsible for the conservation of that taxon can exchange pollen in a controlled breeding program that insures the continuance of a genetically diverse population rather than a population that becomes
overwhelmed by asexually reproduced individuals. This borrows on a technique used by colleagues in the zoological field.

Progress can be slow in improving a complicated measure designed primarily for animal conservation but considerable gains have already been made for wild plants. (Oldfield 1986,12)

D. Idea and Information Exchanges

A common form of international cooperation among botanic gardens involves the establishment of channels of communication to help facilitate the exchange of ideas and information. This section of my thesis deals with the transfer of information among botanic garden professionals either by direct personnel exchanges, by the sharing of published materials or by the exchange of information electronically through computerization.

1. Personnel Exchanges

Perhaps one of the most productive forms of international cooperation among institutions involves the exchange of
personnel for purposes of training and expertise sharing. Twenty-five percent (25%) of the botanic gardens that responded to my survey on international cooperation stated personnel exchanges as at least one form of cooperation in which they engaged.

Papageorge (1982) states that in the past, most forms of personnel exchanges have been conducted quite informally and have oftentimes resulted in a unilateral flow of ideas only. Quite often, TLDC students or professionals are invited to train in institutions in TDC's without the intention of giving them an opportunity to reciprocate by simultaneously conveying their ideas and abilities to their hosts. She goes on to argue that a more structured, bilateral/multilateral policy of personnel exchange among institutions is currently being explored by the museum community.

More often, exchanges occur in a less formal format as individual museums [botanic gardens] are willing to accept foreign interns who can bear their own travel and subsistence expenses. Most forms of professional exchange are essentially "one-way". While valuable, they do not promote much reciprocal
activity or substantial interchange. Through its international arm, AAM/ICOM, the American Association of Museums was able to identify the need for a structured, broadly based reciprocal exchange of museum personnel between American and foreign institutions. (Papageorge 1982, 42)

Aided by funding through the Smithsonian Institution, the "International Partnership among Museums" program (Papageorge 1982, 42) became a reality in 1980. The depth of exchange possibilities seems remarkable.

Through International Partnerships among Museums, museum professionals have had a rare opportunity to gain expertise outside their own environments through first-hand observation of the practices of a museum abroad. By exchanging professional staff, museums were able to share technical expertise and ideas and appreciate different cultural traditions and values. The staff exchanges served to expand knowledge, bear new ideas, consolidate approaches to common problems and strengthen ties within the world museum community. (Papageorge 1982, 47)

One of the major problems facing the botanic gardens of TLDC's is the lack of adequate training to carry out the duties of revitalizing old institutions, building new botanic gardens and conserving the wealth of flora in their nations. The duty of
assisting in this matter invariably falls on the botanic gardens in TDC's (Ern 1984).

Curtis (1984) mentions the need for coordinating this training effort among the botanic gardens in TDC's so that large and small institutions can join in the challenge of training colleagues from institutions in TLDC's. Students from TLDC's and experts the world over should be afforded the opportunity of sharing their expertise with foreign institutions by traveling to them (Berendsohn 1987) also, they should go to international meetings to share ideas and to be more intimately involved with foreign institutions (Ern 1984).

Ashton (1987) proposes the idea of establishing a directory of expertise that can be utilized worldwide by botanic gardens as a source of assistance when needed. He recommends that the administration of this directory be undertaken by the International Association of Botanical Gardens (IABG). Botanic gardens in some of the world's regions are already beginning to cooperate effectively with regards to personnel/expertise
exchanges, "now we need to look at the global problem" (Ashton 1987).

Perhaps one of the most prestigious, ongoing programs of international exchange, among botanic gardens personnel, involves the bilateral agreement on environmental protection signed in 1972 by both the USA and the USSR (Elias 1986). The exchange aspect of this extensive agreement, administered by the Rancho Santa Ana Botanic Garden in the United States and the Main Botanical Garden in the Soviet Union, has been among the most fruitful manifestations of this accord.

Each year, scientists travel to each country to conduct research, collect specimens, and exchange information, especially information relating to rare and endangered plants and the introduction of exotic species. (Elias 1986)

The Soviet scientist, Lapin (1984b) attested to the value of this bilateral agreement between the two nations.

Meetings of botanists from different scientific institutions made possible personal contact, the discussion of trends, and the communication of the results of research in the field of introduction and
protection of rare and endangered species, and
defined ways to develop co-operation in this field.
(Lapin 1984b, 23)

As mentioned earlier, personnel exchanges in the past
have often been a unilateral flow of expertise from the experts in
TDC's to the apprentices in TLDC's. Spitzberg (1978) refers to this
as the expert and counterpart relationship, with the expert being
a TDC professional acting as a teacher and the counterpart being a
TLDC staff-member acting in the student role.

I would like to suggest that botanic gardens follow the
model of the counterpart system as utilized by the Peace Corps
and illustrated by Kawi (1978). In this bilateral/multilateral
manifestation of the counterpart system, all members involved
agree to enter the relationship as equals, sharing not only
technical expertise but also discussing the appropriateness of
this expertise for given situations, cultural considerations and
mutual benefits. There would be an arrogance of sorts in assuming
that the botanic garden professionals from institutions in TLDC's
have nothing of value to pass on to their counterparts in TDC's. It
is indeed TLDC personnel, who are most aware of the holistic needs of their own institutions as well as the plant taxa of their nations. This proposed counterpart system gives everyone an equal forum for discussing issues mutually.

I would like to propose that botanic garden professionals counterpart themselves in a long-term sense with colleagues in foreign institutions. The arrangements should be in place at all times, not just during occasional visits. In doing this, institutions are more permanently unified through the personal contacts of their professional staff.

A major obstacle to the concept of expertise sharing through personnel exchanges is that of funding. Though this thesis does not address this topic, I would like to mention that botanic gardens need to creatively explore sources of funding for personnel exchanges through major international assistance organizations established for the purpose of fostering international cooperation among scientific, cultural and educational institutions.
2. Written and Electronic Information Exchanges

The exchange of ideas and information through means such as correspondence, literature exchanges and electronic communication is a central tenet to the concept of international cooperation among botanic gardens. The survey of international cooperation among botanic gardens (Appendix A, page 172) shows, 50% of the respondents claimed information and literature exchanges as being one of the vehicles by which they cooperated. If done for no other reason than the avoidance of duplicated efforts with respect to plant conservation and collections establishment (Ward 1983), international communications would serve botanic gardens well. There are other reasons why the exchange of ideas and information could greatly benefit botanic gardens; tapping into expertise to help solve problems for which local expertise is lacking and a general cross-fertilization of experiences that helps reduce the impact of "parochialism" (Papageorge 1982, 42).
One of the most effective means of facilitating international communication among botanic gardens is through the use of a professional newsletter. The IABG is one of the logical vehicles by which botanic gardens can foster international communication with each other. Though the IABG’s international body has yet to develop a newsletter, one of the most active sections of this organization, the European - Mediterranean Division has had such a newsletter in place since the early 1980’s and actively solicits articles (Ern 1984).

Ward (1983) alludes to the current problem of botanic gardens not contributing freely enough to international newsletters that have the potential for reaching the majority of the botanic gardens. He specifically mentions the IABG/European - Mediterranean Division’s newsletter as well as the varied publications of the IUCN. He encourages a much greater involvement with this medium of information exchange.

As yet, one of the great untapped potentials for international cooperation among botanic gardens involves
increased communication among the world's botanical and horticultural libraries (Teeter 1988).

To help facilitate cooperation among the libraries of botanic gardens, the Council on Botanical and Horticultural Libraries (CBHL) was formed in April 1970 at a meeting held at the Hunt Botanical Library, Pittsburgh, Pennsylvania, USA.

The purpose of this organization is to initiate and improve communication between persons and institutions concerned with the development, maintenance, and use of libraries of botanical and horticultural interests. (Gignac 1983, 224)

To facilitate international cooperation, the CBHL has produced a directory of member libraries (Callery, Teeter and Wolfe 1983) listing about 120 institutions in Australia, Canada, the Dominican Republic, Mauritius, New Zealand, South Africa, the United Kingdom, the United States of America and the Union of Soviet Socialist Republics. This directory includes contact names, addresses, library collections information and exchange policies for each institution. The CBHL is a growing organization, the most recent membership brochure claiming about 170 members.
An important example of the potential of CBHL member activities occurred in August 1987. Three CBHL members representing three major USA botanic gardens; Rancho Santa Ana Botanic Garden in California, the New York Botanical Garden and the Missouri Botanic Garden journeyed to visit professional colleagues in the USSR. This trip was developed as part of the previously mentioned USA/USSR bilateral agreement on matters pertaining to scientific exchanges. The three CBHL members visited ten libraries in the Soviet Union. The trip was organized in part to establish the personal contacts so vital in facilitating effective library exchanges between nations (Council on Botanical and Horticultural Libraries 1987).

In 1946 the International Council of Museums (ICOM) was formed for the purpose of "embracing individual and institutional members throughout the interdisciplinary world of museums" (Papageorge 1983, 63). This institution serves all forms of museums including botanic gardens. With national committees in nearly eighty nations and almost thirty specialized working
groups (Herscher 1985), ICOM has developed sophisticated systems for facilitating communication and cooperation within its varied bodies.

As Herscher (1985) points out, ICOM has developed an extensive publication system including such prestigious magazines as *ICOM News* and the UNESCO publication *Museum*. In 1948, ICOM took over responsibilities for managing UNESCO's extensive Documentation Center.

The original aim [of the UNESCO-ICOM Documentation Center] was to collect information on museum work and make it available to UNESCO personnel and ICOM members. Now the center provides reference services to all interested persons, with holdings of 40,000 monographs, 1,500 periodicals and 45,000 indexed articles. It acquires museum-related works in a multitude of languages. (Herscher 1985, 63)

As an additional service, the ICOM Documentation Center maintains an up to date list of experts who can be recommended as consultants (Herscher 1985).

A review of ICOM publications shows few if any articles related directly to the work of botanic gardens. It seems obvious
that botanic gardens need to take a more active role in this international organization and thus capitalize on the benefits of its extensive infrastructure related to international cooperation among all members of the extensive and diverse museum community.

As is fully described by Chandler (1982) in his extensive work on national and international library systems, there exists, an effective network of cooperation among professionals in the Library Science field.

Emanating from the structure of national library systems, are sophisticated methods of seeking out and extracting information relevant to almost any professional field. Chandler (1982) explains the various ways in which information is stored and retrieved at the national and international levels. He provides his readers with a complete description of the capabilities of national library systems in fifty of the world’s nations; seven in the Americas, thirteen in Western Europe, four in Eastern Europe, twelve in Africa and the Middle East, eleven in Asia and three in
Oceania. Listed also are some of the international organizations (e.g. UNESCO) that are responsible for facilitating better information exchange among the world's libraries and information organizations. Institutions, such as botanic gardens, seeking international information are advised to contact their own national library systems which are entrusted with the responsibility of seeking out requested information. By capitalizing on this extensive, existing network of communication and cooperation, botanic gardens can benefit with only a minimal expenditure of energy.

Computers currently hold a great potential for assisting in the quick and accurate transfer of information among botanic gardens (Brenan, Ross and Williams 1975). Not only are computerized systems of benefit when dealing with herbarium exchanges. They can avoid undesirable duplication in plant collections (de Jong, van Vliet and Wijands 1983 (?)) and assist in the easy national, regional and international transfer of collections information to anyone who requires such data.
[The IUCN encourages botanic gardens in the] establishment of a proper record system and, if possible, computerized database linked with national and international databases, so that all kinds of information about plants recorded can be made available to those who need them. This may seem banal but one of the greatest sources of waste in botanic gardens is the non-availability of information on holdings and their characteristics or, at least, the lack of ready access by outsiders to such information. The IUCN Botanic Garden Conservation Co-ordinating Body, CMC database and circulated lists are just an indication of what can be done . . . . Because of their long-term continuity, botanic gardens are specially suited to hold such databases or contribute to them. (Heywood 1984, 38)

Computerization, though a fixture in the future successes of botanic gardens worldwide, is still a practical difficulty for many institutions. This is especially true for botanic gardens in TLDC's where funding is limited, where sensitive equipment is prone to harsh environmental conditions and where even basic needs of computerization, such as electricity, are undependable.

Nonetheless, one of the most promising of plans utilizing computerization is currently being developed by the IUCN for purposes of plant conservation (International Union for
Conservation of Nature and Natural Resources 1987). The IUCN's Botanic Gardens Conservation Secretariat hopes to establish a plant collections monitoring and coordination scheme to help "co-ordinate \textit{ex situ} collections worldwide [and] to ensure [that] as wide a range of conservation-worthy plants as possible are maintained in cultivation" (International Union for Conservation of Nature and Natural Resources 1987, 8). The IUCN provides a description of how the computerized system will work:

As before, each garden in the scheme [about 250 to date] will be expected to contribute data on its holdings of conservation-worthy plants, preferably in electronic form using the newly designed International Transfer Format (ITF). For gardens on computer, this will mean converting their file into ITF and sending a copy on a diskette or magnetic tape to IUCN each year. Physical compatibility is not required. Gardens will be encouraged to computerise their records in their own institutions, using PC's where appropriate. To encourage better recording and to assist computerisation, IUCN is planning a Manual on Botanic Garden Plant Records. Each garden needs to have its own effective data management system, compatible with that of other gardens and with IUCN.

In return, all gardens will receive [from the IUCN]:

1. Annual printouts of their collection in relation to the collections of other members. Gardens on computer will be offered the option of also
receiving a tape or diskette with the data included, so they can add it to their own data files.

2. General reports on the status of plants in cultivation.

3. Answers to individual inquiries.

Online access to the CMC database is possible and can be negotiated at an extra price, but at present the hardware and telecommunications costs for each remote user are not cheap. IUCN is exploring options of reducing this cost through connection to international networks, following the opening of the first remote terminal on the CMC system in September 1986 at the U.S. National Park Service, Washington, D.C. Undoubtedly costs will come down over time and eventually one could envisage most, if not all, Gardens having online access to the database; it is being designed and built with this in mind. This would be in addition to the gardens' own databases, whether on PC's or on larger computers. (International Union for Conservation of Nature and Natural Resources 1987, 9)

As with ICOM, the IUCN is also considering other innovative uses for computers such as the creation of a "database of experience" (International Union for Conservation of Nature and Natural Resources 1987, 9) that can be informally amended and accessed.
No doubt that computers shall continue to play an ever increasing, vital role in the concept of international cooperation among the world's botanic gardens.

E. Cooperation through Organizations and Conferences

Appendix G, on page 271, is a partial listing of various internationally-oriented organizations that are important when considering the concept of international cooperation among botanic gardens. Of all the organizations listed, there are several that are central to fostering international cooperation among botanic gardens. There is one organization however that, I feel, is primary. This organization is the International Association of Botanical Gardens (IABG). Its prominence in all aspects of botanic garden cooperation warrants closer attention.

The IABG was formed in Paris, France, in 1954 at the eighth International Botanical Congress as an affiliate to the International Union of Biological Societies (IUBS). It was organized in response to an expressed need by botanic garden
administrators and scientists to have an association that specifically addressed their unique needs (Robyns 1954).

The IABG's constitution (Appendix F, page 267) makes it clear that the organization is strongly committed to the principles of fostering international cooperation among botanic gardens. The best possible role that the IABG can play with respect to international cooperation among botanic gardens emerges with an understanding of three basic models of cooperation possible among such institutions. In the first model, two or more botanic gardens connect with each other directly. The purpose of such contacts can be as simple as an exchange of Indices Seminum or as involved as a formal, working partnership.

In the second model, botanic gardens of a specific nation link themselves intranationally, oftentimes forming organizations for the purpose of coordinating mutually beneficial activities. Occasionally, these intranational organizations connect with those of other nations or regions directly. This is evidenced by the cooperation between the Center for Plant
Conservation in the USA and the Canadian Plant Conservation Program, which the Center for Plant Conservation helped in getting established (Falk 1987). This second model may pertain to intraregional forms of cooperation among botanic gardens that consider plant taxa a greater bond than any barriers created by political boundaries.

In the third model, both individual botanic gardens and intranational botanic garden organizations are linked together for a variety of purposes through a central, coordinating, international organization. It is in this third model that the IABG is generally recognized as the international body that is entrusted with the responsibility of linking the world's botanic gardens into one, solid, cooperating network.

It [the IABG] was described as an international non-political body representing the interests of all gardens of the world and designed to develop specific contacts and co-ordination between them in order to make their work more effective for the sake of man's well being. The Association was expected to co-ordinate the work of the botanic gardens on plant introduction, methods of cultivation and the spreading of botanical knowledge among people. (Lapin 1984b, 17)
Currently, the IABG meets, as an international body, once every six years. The meetings are usually held in conjunction with, and just following, the meetings of the International Botanical Congress. The most recent gathering of botanic garden professionals interested in IABG affairs was the Tenth IABG General Meeting and Conference, held at the Palmengarten, Frankfurt am Main, Federal Republic of Germany, in August, 1987. Some 125 individuals attended, representing botanic gardens from nearly forty nations. This meeting provided participants with excellent opportunities to learn of the accomplishments, needs and goals of colleagues worldwide. It provided an atmosphere of cooperation, good-will and idea sharing with the ultimate hope of creating a greater network of cooperation among botanic gardens. A hope for the future, in spite of the usually tight economic conditions found in botanic gardens, is that more institutions find the means for sending representatives to the periodic IABG international meetings.
As presently organized, the international body of the IABG has no permanent headquarters or staff. Rather, on an approximately six-year rotational basis, the presidency is voluntarily assumed by a high-ranking member of a botanic garden with international interests. Though considerable debate and cautions can be brought against the concept of institutionalizing an organization such as the IABG, there are reasons for the IABG to consider adopting procedures that will result in a permanent headquarters and staff so vital to the continuum of a world class organization.

In addition to actively pursuing individual and institutional memberships, the IABG needs to ally itself with a major world development organization for purposes of obtaining facilities, resources and expertise. One possible avenue to be considered by the IABG is to pattern itself along the model presented by ICOM. Acting as an advisory organization to the United Nations Educational, Scientific and Cultural Organization (UNESCO), ICOM has obtained a key position in world affairs
pertaining to the entire museum community. Based in Paris, France, ICOM is able to fund its activities in part due to its membership dues and in part due to UNESCO funding (Messer 1979).

One of the functions of the IABG is to foster the development of regional chapters in areas of the world where no collective botanic garden representation exists. Likewise, the IABG is entrusted with the responsibility of seeking the support of strong national and regional botanic garden associations in areas where they already exist.

At the IABG meeting in August 1982 in Hamburg a proposal was made to form continental IABG sections. Sections of that kind will be able more effectively to solve regional problems of co-operation between botanic gardens. On the North American continent such tasks will be fulfilled by the already existing American Association of Botanical Gardens [and Arboreta]. (Lapin 1984b, 20)

This proposal has already resulted in the formation of the IABG / European-Mediterranean Division. Active since 1983, this division has had a very positive impact on both European and
world issues concerning botanic gardens. According to Vrugtman (1987) the IABG is helping in efforts to establish regional divisions composed of botanic gardens who collaborate with each other because of their similarities. To this end, the "Australian / South-Pacific Division" (Vrugtman 1987) and the "Chinese Association of Botanic Gardens" (Vrugtman 1987) were formed in 1985. There is considerable effort under-way to form a "Latin American and Caribbean Garden Association" (Larsen 1987, 4) as a division of the IABG. Professor Larsen provides us with an interesting insight into the goals of the IABG and the establishment of regional divisions:

As Botanic Gardens in the World have problems of various kinds, a regional division of the IABG [the European-Mediterranean Division] was discussed and agreed upon. It was decided that the regions should not be too small; that they should be formed as areas linked together by history, tradition and plant geography. Europe and the Mediterranean countries is certainly such a region. Other regions would be North America, South America, S.E. Asia linked with Australia, and Tropical Africa. It is not thought necessary that all the regions should be established at once. On the contrary, it would be better if these regional chapters evolved naturally. This is what has happened in Europe . . . . (Larsen 1983(?), 1)
According to Lathrop (1987), no official relationship exists between the IABG and one of the best organized, independent regional botanic garden associations namely the American Association of Botanical Gardens and Arboreta (AABGA). Though the AABGA does have a distinguished member designated as the "IABG Official Representative" (American Association of Botanical Gardens and Arboreta 1987, 2) the connection is really quite informal. In an interview with Lathrop (1987) I was able to ascertain that the AABGA would seriously consider any overtures by the IABG in representing international interests on the North American continent. The prospect of hosting a joint meeting between the AABGA and the IABG, or one of its formal divisions, also seems to be a possibility according to Lathrop (1987). A main concern of the AABGA is that it maintain full autonomy and control over its own affairs.

Though there also appears to be no formal connection between the IABG and the USSR's Botanic Gardens Council, there does appear to be frequent communication and cooperation
between these two bodies.

The USSR Botanic Gardens Council has encouraged the broadening of international connections and co-operation with foreign scientific institutions and scientists in the conservation of rare and endangered species. It maintains relations and works actively with the IABG, the International Society for Horticultural Science and the Commission on rare and endangered plants of the IUCN Soviet botanists are represented in the directing bodies of these foundations, are members of editorial boards of some international magazines, and take an active part in international congresses, symposia, conferences and joint botanic expeditions. (Lapin 1984b, 22)

The IABG has the potential for becoming one of the great moving forces in the international botanic garden community. The IABG needs to develop a strong central body, permanent headquarters, active regional divisions, conspicuous scientific and administrative publications, a dues paying membership and an international directory of botanic garden expertise for world sharing among institutions. Likewise, a strong involvement in future international gatherings among botanic garden professionals, such as the upcoming "International Symposium on Botanical Gardens" to be held in Nanjing, People's Republic of
China in September 1988, (He 1987b), strengthens the IABG's position in the field.

Botanic gardens need to grow into an awareness that their continued success is becoming increasingly proportional to their skills in international cooperation.

Botanic Gardens will in the future face increased economic and environmental problems which the individual garden may find difficult to solve. Only through a global network of gardens working closely together shall we be able to take up this challenge and solve the problems. (Larsen 1983 (?), 1)

What is now needed is a greater involvement in the IABG by botanic gardens worldwide.

F. Institution Building

Eaton defines institution building as:

[The] planful establishment of new organizations to serve purposes which are judged by those in power to require autonomous administrative intervention and special linkages to the larger social system, different from those which can be provided by already existing administrative units. (1972)
Closer to the field of botanic gardens, Potter describes the objectives of institution building as "develop[ing] an indigenous, long-run, technical assistance facility that can provide, or create, the techniques for solving problems relevant to its environment" (1972). For purposes of this thesis, institution building is the building, rebuilding or renovation of botanic gardens with particular emphasis on the impact that institutions in TDC's have on those in TLDC's.

The need for developing botanic gardens in tropical countries is becoming a critical issue.

Primarily tropical botanic gardens are now needed to study their own flora and help to discover the wealth which still lies unknown. Intelligent exploitation of plant resources must go hand in hand with conservation so that tropical countries can be enriched and not denuded. (Curtis 1984, 69)

There are many institutions in TLDC's that have fallen into a state of neglect and disrepair since the end of the colonial era, commencing about the mid 1940's (Curtis 1984). As predominantly isolated institutions, there is a tendency for
affluent botanic gardens to flourish while the world's less fortunate institutions struggle or even cease to exist.

The trend for the rich getting richer and the poor becoming poorer can also be applied in the world of botanic gardens. Colonial governments, particularly the British in the nineteenth century, firstly created botanical stations to develop local agriculture in the tropics. As those responsible had been trained in botanic gardens, it was not long before these stations also supported botanic gardens. To visit most of these now can be a depressing experience because in the opinion of the later national governments they were no longer relevant and an unnecessary burden. (Beyer 1984, 52)

The unilateral flow of resources, rapid departure of colonial support, general malaise of indigenous governments, relative isolation of botanic gardens and low priority status afforded botanic gardens in TLDC's due to economic pressures are factors that need to be corrected in order for the institutions in TLDC's to become full members in an international botanic garden strategy.

The need for botanic garden rebuilding and rejuvenation is a problem that is being faced by institutions in TLDC's. This is not
a problem that institutions in TDC's should view as an 'us helping
them' problem for indeed, some botanic gardens in TDC's are also
facing problems of decline as well. The difficulty is a universal
one and botanic gardens in general need to prepare to help their
national colleagues as well as institutions in foreign nations.

I think the time is fast approaching when some of the
gardens in Europe are faced with the same threat [as
those in TLDC's]. There is evidence to suggest the
recent economic recession in Britain has already
caused casualties. IABG must consider how it can
support its weaker members and make them more
able to withstand such pressures . . . . (Beyer 1984,
52)

As Beyer (1984) indicates, the IABG is being called upon
to coordinate activities targeting the building, rebuilding and
rejuvenation of botanic gardens worldwide. Likewise, Heywood
(1987) indicates that one of the newly accepted responsibilities
of the IUCN, in implementing its botanic gardens conservation
strategy, is to send experts to various parts of the world for the
purpose of starting new botanic gardens as well as rejuvenating
old institutions.
According to Bermejo (1987), a lack of sufficient funding makes the development of effective botanic garden activities in Latin America a very difficult task. The International Union for Conservation of Nature and Natural Resources (1987) states that botanic gardens worldwide need to put greater pressure on international assistance organizations to devote more funding for international botanic gardens development. Likewise, the more affluent of the world's botanic gardens need to seriously think about their responsibilities toward the poorer botanic gardens, keeping in mind that the future of all botanic gardens is directly related to a healthy, worldwide network of institutions.

If we can build great institutions in the first-world [TDC's] that cost millions [of U.S. dollars], we need to ask ourselves, and reach within ourselves, for the power to build and develop botanic gardens where they are more needed in the world, the third-world countries [TLDC's]. (Heywood 1987)

Hamann, Leon and Synge (1984) go so far as to suggest that botanic gardens in TDC's should consider 'adopting' a botanic garden in a TLDC as a means of focusing efforts oriented to institutions building.
The issue of funding is indeed the limiting factor when it comes to the concept of institution building among botanic gardens. Only 16% of the institutions that responded to the survey (Appendix A, page 172) stated some sort of involvement with institution building. Even the world's most affluent botanic gardens need to exercise some caution in matters of international philanthropy. It would be unfair to assume that the world's richer botanic gardens should assume the heavy burdens of foreign institution building without significant support from outside funding organizations.

Ern, however, does leave us with a poignant comment worth considering.

Why should we not be able to 'twin' [unify] with gardens in the third-world [TLDC's] if we spend so much money in the first-world [TDC's] to establish our conservatories! (1987b)
Chapter II

THE CONCEPT OF ESTABLISHING AGREEMENTS

A. Forward

International cooperation among botanic gardens is manifest in a variety of forms. The concepts addressed in the second chapter of this thesis concerns itself with the degree of formality by which cooperating institutions can, should and do approach international relationships. This chapter specifically looks at the issues of written documents of agreement and their place in international cooperation among botanic gardens. The chapter ends by presenting some ideas concerning the actual development of documents of agreement.

B. The Degree of Agreement Formality

I define formal cooperation as any type of cooperation
that is backed by some type of written agreement that; first, specifically targets the institutions involved in the international cooperation endeavor, and second, outlines the criteria for cooperation including factors such as objectives, responsibilities and expectations. By comparison, informal agreements include exchanges such as "oral statements, memoranda of understanding, exchange of notes, [etc.]" (Osakwe 1971).

It is important to note that the above definition is not shared by many of the botanic gardens currently involved in international cooperation. Of the 128 respondents to the survey (Appendix A, page 172), 77% claimed to be involved in some sort of cooperation with similar institutions in foreign countries. Furthermore, 42% of the respondents claimed their cooperation to be "formal" in nature, using their own definitions of formality. However, only 18% of the respondents actually support their international cooperation with some type of written documents of agreement.
This discrepancy of who considers their cooperation to be formal as compared to those who actually support this formality with written documents of agreement is quite possibly due to at least two factors operating simultaneously. On the one hand, botanic gardens have a serious commitment to the cooperative endeavors that becomes equated with a formal arrangement. At the same time however, there is a very strong desire among botanic garden professionals to function as independently as possible from other institutions (Hamann, Leon and Synge 1984), thus the lack of documents of agreement. Documents of agreement are oftentimes erroneously perceived as constraints to international cooperation rather than as a means by which cooperation is efficiently fostered.

A serious, positive attitude towards cooperation surfaced in the survey (Appendix A, page 172). All institutions surveyed were encouraged to provide written comments concerning their attitudes about cooperating with foreign institutions. Eighty-four percent (84%) of the respondents provided feedback in the form of
either ideas, advice or supportive comments. Representative or noteworthy comments are included in this thesis as Appendix A(4) on page 197. In all cases, the response was positive concerning the value of international cooperation among botanic gardens. However, the receptivity of botanic garden professionals to the concept of developing written documents of agreement in support of their cooperation endeavors was mixed. I extracted over fifteen reasons as to why such documents of agreement have not been developed. The major reasons are listed in Appendix A (3), on page 191. Three most commonly stated reasons being: that verbal agreements are sufficient for the type cooperation being conducted (27% of all respondents), that written documents of agreement require too much administrative work (8% of all respondents) and that institutions are generally unprepared for the commitment that written agreements imply (8% of all respondents).

There is a feeling in the botanic garden community that formalizing cooperation, through written documents of
agreement, will in some way undermine both the voluntary process of international cooperation as well as the independence of individual institutions.

From IUCN's experience, the most effective mechanism for change is a loose informal network of many different types of institutions in which all 'pull on the rope', but each in their own unique way and with their own special skills and in partnership with their own constituency. The co-ordination has to be loose and creative, not pre-empting the rights of Directors to direct their institutions, but providing them with the facts and concepts they need to be most effective for the common goal. (Hamann, Leon and Synge 1984, 25)

As a counterpoint, in alleviating any concern that botanic gardens may have with respect to their independence and individuality while involved in international cooperation endeavors, van Vliet (1984) states that institutions cooperating internationally agree only to committing a small segment of their resources to the cooperating effort. Generally, the involved institutions continue to operate independently in those areas not committed to the accords of international cooperation.
Van Vliet (1984) goes on to state quite correctly, that a completely voluntary approach to international cooperation is one of the best ways of insuring that cooperating institutions approach their tasks with the greatest measure of energy possible. It is erroneous to assume however that the voluntary attitudes, so important to international cooperation, will automatically suffer if agreements are formalized through documentation. Cooperating institutions initially enter into agreements voluntarily and then, ideally, commit the criteria for cooperation to some form of codification. The two issues, independence and agreement documentation, though related, are also quite distinct.

There is a concern that the formalization of agreements of cooperation through documentation can lead to the exploitation of some by the strong, self interests of others.

The well-documented information brought together for these collections [specialty collections of plant taxa for conservation purposes that specific institutions agree to maintain by mutual discussion] must of course not serve as a free ticket for some of our 'stamp collecting' colleagues [those who acquire
one or more specimens of highly desired species for the sole purpose of saying that they have it] to acquire all the rare and interesting species. For the same reason I prefer a voluntary co-operation. (van Vliet 1984, 49)

In response to this concern, it can be conjectured that the lack of formal documents of agreement, stipulating the objectives and nature of cooperation among foreign institutions, has already led to the exploitation of those in weaker positions by those in positions of greater power and information. This is especially of concern to the institutions of TLDC's in their relations with institutions in the TDC's (Keiding 1987).

One can argue that in a perfect society, based on honor, trust and efficiency, formal documents stipulating the objectives and nature of cooperation are quite unnecessary.

If countries [and presumably the institutions included within nations] truly trusted each other to behave honorably, international agreements would be unnecessary; negotiations presuppose lack of trust. Moreover, the most successful agreements are in part self-enforcing because they satisfy the interests of the various parties. (Anderson 1987, 31)

Though written in a political context, Anderson (1987) raises
several pertinent issues that need to be addressed. He raises issues of trust, free-will and a mutuality of benefits relative to the energy expended on endeavors. He challenges the philosophical foundations of written documents of agreement.

The importance of the concept of cooperation itself can hardly be challenged. Bilder points out that mankind's ability to cooperate "may be among the most basic distinguishing features of the human species" (1981, 4). The issue of supporting international cooperation by developing documents of agreement is an established, age old principle that mankind has adhered to for well over 5,000 years (Nussbaum 1954). Professionals in international cooperation among nations, consider the development of written documents of agreement as both basic and indispensable.

The most important way in which nations reach cooperative arrangements is by negotiating and concluding written international agreements or treaties. (Bilder 1981, 5)
International relations experts place so much value on the development of written documents of agreement, outlining the specifics of cooperation, that in 1980 after more than ten years of debate and development, world representatives to the United Nations, passed the Vienna Convention on the Law of Treaties (Sinclair 1984). Based on international laws and customs, this convention is a written treaty on the development of written treaties!

Bilder (1981) provides a number of reasons as to why international cooperation endeavors should be supported by written documents of agreement. These reasons are universal and fundamental.

(1) A written agreement increases the reliability and stability of a cooperative arrangement by providing a means through which nations [institutions] can rationally plan the arrangement and communicate to each other and publically record the precise terms of their cooperation. A written agreement can make clear what each other is to do or not do, when, and how; what conduct constitutes breach; the means of restoring complimentarity if breach occurs; and so forth. In effect, the agreement serves to lay down . . . what the rules governing the cooperation are to be and how the game is to be played.
(2) By embodying their cooperative arrangement in the form of a legally binding written agreement, the nations [institutions] participating in the arrangement can increase the chances that it will be kept. More specifically, the written agreement furnishes nations with a formal or ritual device through which they can clearly characterize their cooperative relationship as one based upon mutual reliance and trust, and invoke the normative and sanctioning system of the broader international legal order in its support . . . .

(3) A written agreement facilitates the negotiation of a cooperative arrangement by permitting nations [institutions] to place their offers and counteroffers in a common frame of reference, to assess more easily the comparative benefits and costs of alternative cooperative arrangements, and to fix a single point of commitment at which negotiations cease and cooperative bargaining is struck.

(4) A written agreement provides a standardized framework in which nations, through a choice of risk-management provisions and techniques, can adjust and manage the risks of their cooperative arrangement. (Bilder 1981, 6-7)

Legally enforceable arrangements, as recommended by Bilder (1981), might well discourage a majority of botanic gardens from accepting the concept of agreement documentation. "An agreement is an example of what can be done and should be done. Its enforcement is gentlemanly" (Granhof 1987). As stated
earlier, the initiation of cooperation and the continuation thereof must always be voluntary, not an enforced cooperation. Bilder (1981) does state that it is a concern for risk taking that compels the parties of international endeavors to shy away from making such agreements legally binding. This is perfectly acceptable to Bilder (1981) who states that in developing documents of agreement, cooperating parties who do not desire to be bound by legal agreements, need only to state this in the document.

Eight important reasons for botanic gardens to seriously consider developing formal, written documents of agreement with respect to their international cooperation endeavors are stated and expanded upon in the following pages:

1) To clearly state institutional intentions and abilities (Messer 1979). Refer to page 125.

2) To clearly state institutional needs and expectations (Papageorge 1980). Refer to page 125.

3) To provide for a dependable, long-term institutional memory of international cooperation. Refer to page 126.
4) To allow cooperation with institutions in some nations such as the Union of Soviet Socialist Republics and the nations of Eastern Europe (Elias 1988). Refer to page 128.

5) To help obtain external sources of funding (Herscher 1985). Refer to page 129.

6) To facilitate long-term cooperation (Nabhan 1987). Refer to page 131.

7) To help gauge the progress of international cooperation endeavors (Bryant and White, 1982). Refer to page 136.

8) To provide criteria by which efforts are ultimately evaluated and thereby assisting in the design of future cooperation endeavors (Bryant and White 1982). Refer to page 136.

International cooperation activities, while with great potential, may also be frustrating experiences as differences in culture and communications abilities create an atmosphere of unclear motives and intentions. "It is the simple things that are most difficult to understand, largely because they are often taken
for granted when they should not be" (Messer 1979, 54).

When botanic gardens clearly state their abilities, needs and expectations in the form of written agreements, they create an atmosphere whereby all parties involved are compelled to seriously review their interests as compared with their capabilities and responsibilities before they push forward with committing to, and implementing various forms of international cooperation (Papageorge 1982). They are able to ensure the greatest probability that a true bilateral or multilateral exchange will occur rather than the cooperation being only unilaterally beneficial (Papageorge 1980) or particularly burdensome for one of the cooperating parties.

By themselves, the term "cooperation" and "coordination" mean little unless all participants in the program receive tangible benefits . . . . No museum [botanic garden] should join a collaborative programming effort unless it is certain that it stands to profit thereby. (Burgard 1983, 29)

Documents involving international cooperation agreements should have clauses that permit reviews and changes
in procedures as the need arises (Bilder 1981) and (Rondinelli 1983). As with the initial documents, any changes should be formally recorded as a matter of record and by mutual agreement of all concerned (Bilder 1981). Subtle shifts in attitudes by cooperating parties without notification and discussion with cooperating members is to be discouraged.

In searching for information of pertinence to this thesis, one of the greatest of difficulties encountered has been the lack of substantial institutional memory on matters related to international cooperation. Since so much international cooperation among botanic gardens occurs without the benefit of documents of agreement, the knowledge of even the remotest nature of any cooperation rests almost solely in the memories of the individuals engaged in cooperating endeavors. When such an individual changes institutions, retires or dies so too does the institutional memory concerning international cooperation. Often, the only records that botanic gardens have of their international cooperation activities are brief references to such endeavors in
yearly reports or newsletters. Hardly enough exists upon which to build future bridges of cooperation based. Furthermore, without written documents stating the nature of agreements as well as subsequent writings concerning an evaluation of cooperation efforts, botanic gardens are ill prepared to share their experiences with other institutions contemplating international cooperation.

One respondent to my survey went so far as to implied that the lack of institutional memory hampered their institutions current progress regarding international cooperation.

I am not suggesting that we should discount the importance of the human factor in matters of international cooperation. "Cooperation is encouraged and stimulated by individuals" (Keiding 1987). "Personal contacts are basic [to international cooperation] but its nice if they [agreements] can be written down" (Granhof 1987).
According to Elias (1988) there are nations wherein many forms of international cooperation are virtually impossible without the development of extensive documents of agreement. Such conditions may have their origins in either the cultural or political structure of a nation. This situation is especially true of institutions located in nations with top-down paradigms of decision making such as is manifest in the Warsaw Pact nations.

This sentiment is both echoed and expanded upon by Granhof (1987) with respect to many TLDC's. Regardless of their political affiliations, many TLDC's still operate under the top-down system of decision making (Bryant and White 1982). Granhof (1987) feels that botanic gardens in TLDC's need written documents of agreement in order to receive the governmental authority to cooperate, for economic support, legal clearances, etc. "Agreements [written] are specifications [to the authorities] on what is being done with time [and] where time is being spent" (Granhof 1987). This is especially true if the cooperating endeavors involve a transfer of such visible resources as money,
equipment and other factors of economic value.

This thesis does not deal with one critical aspect of international cooperation among botanic gardens, namely the funding of international endeavors. This topic is a thesis in itself. I briefly raise the issue here for purposes related to defending the premise that international cooperation should be backed by formal, written documents of agreement.

Resolution number 2, adopted by the Thirteenth General Conference of ICOM in London, United Kingdom, in 1983 states:

[ICOM] urges the national authorities in each country as well as the international community, and in particular the international and regional development agencies, to consider within their development programs and budgets increased support for the establishment and strengthening of museums as essential to the well-being of their communities. (Leavitt 1984, 79)

The survey (Appendix A, page 172) shows that a significant number of respondents (13%) do not cooperate internationally, mainly because of a lack of adequate funding. Several respondents felt that higher percentages of botanic
gardens at least considered the lack of adequate funding as a deterrent to international cooperation. This figure was conjectured to be as high as 85%-90% by Wise (1987). With but a few exceptions, funding in botanic gardens has usually been quite limited, especially in matters involving international cooperation (Heywood 1987). Botanic gardens interested in cooperating internationally need to tap into the resources at the disposal of national, regional and international funding agencies, both private and governmental, thus becoming players rather than spectators in world matters which ultimately affect botanic gardens as well. Obtaining funding for international endeavors is a complex process requiring not only documents of agreement but preliminary and followup documentation as well (Bryant and White 1982), (Granhof 1987) and (Rondinelli 1983).

Recognizing this critical need for funding, the IUCN, meeting in Las Palmas, Canary Islands in November 1985, with representatives of botanic gardens from thirty-nine nations, passed a series of Recommendations, the entire of which is
included in this thesis as Appendix E, page 255. Part of Recommendation number 3 is particularly pertinent to the issue of funding.

The International Conference on Botanic Gardens and the World Conservation Strategy: Recommends governments and states, in association with international agencies, to review the distribution of Botanic Gardens and to recommend, where appropriate, the creation and funding of new Gardens with a major conservation mission. (International Union for Conservation of Nature and Natural Resources 1986, 7)

When the Desert Botanical Garden, Phoenix, Arizona, USA entered into a formal agreement of cooperation with the Centro de Investigacion y Desarrollo de los Recursos Naturales de Sonora (CIDESON), a consortium of institutions in the Sonora region of Mexico, one of the motivating factors behind formalizing agreements was the desire to develop a long-term, permanent partnership among the cooperating institutions (Nabhan 1987). The documentation of cooperation is seen as a solid, confident commitment to the process of international cooperation (Bilder 1981) and Nabhan (1987).
When two institutions link with each other to address common goals, such a unification is referred to as a partnership (Papageorge 1982), twinning (International Union for Conservation of Nature and Natural Resources 1987) or sistering (Raven 1987) and (He 1987a). Such arrangements are usually bilateral in nature, though they may be multilateral if three or more institutions/organizations are involved.

Though partnerships are oftentimes perceived as being very formal arrangements based on written documents of agreement, Crossan (1987) cautions that indeed such arrangements may be quite informal serving purposes of prestige and diplomacy more than addressing the scientific concerns of botanic gardens. The agreement between the Desert Botanical Garden and CIDESON is a formal, multilateral partnership backed with concise, written documents of agreement (Nabhan 1987). Current perceptions among many botanic garden professionals (Ern 1987), (Friis 1987) and (Hepper 1987) are strongly in favor of the more active, goal oriented form of partnerships.
There exist, however, a number of informal, sistering arrangements among botanic gardens that experience bursts of activity upon initiation followed by periodic activities, rather than a continuous or increasing involvement among cooperating members. For example, the sistering arrangement that exists between the Missouri Botanic Garden, St. Louis, Missouri, USA and the Nanjing Botanical Garden/Sun Yat-Sen Memorial, Nanjing, People's Republic of China is quite informal, based on informal letters of exchange (Raven 1987) and (He 1987a). Though informal, Raven (1987) states that the arrangement has resulted in some noteworthy activities, especially in the areas of personnel and plant exchanges. Raven (1987) does state that, should the need arise, this sistering arrangement has the potential for being developed into a much more formal partnership. Such informal situations are mentioned by Bilder (1981) as a form of risk management whereby cooperating institutions informally cooperate with each other, reserving the right for future activities of a much more formal nature should the desire arise.
Both the formal and informal partnership agreements tend to be remembered because of written articles developed about them, usually for public relations purposes. Communications with Nabhan (1987), Raven (1987) and He (1987a) lead me to believe that formal agreements as manifest by the Desert Botanical Garden/CIDESON partnership stand to gain more in terms of concrete developments than the informal arrangements as manifest in this case by the Missouri/Nanjing sistering arrangement. What the Desert Botanical Garden/CIDESON arrangement has going for it is a series of well-developed objectives and procedures, all set down on paper.

One should not discount the value of partnership agreements that function as vehicles for prestige, diplomacy or periodic, situational exchanges rather than as formal, ongoing scientific and administrative cooperation endeavors. As Papageorge (1981) points out, such informal arrangements have worked wonders in the context of political and cultural dialogue as witnessed by the popular Sister Cities International (SCI)
movement that links foreign cities and towns together. Botanic gardens can also profit from such informal arrangements assuming that they understand the extent and limitations of these types of partnerships if undertaken as informal contacts. The SCI program actively encourages a wide variety of institutions to become involved in their level of international cooperation. Herein already exists an infrastructure for cooperation that botanic gardens need to further explore.

There is no more broadly based cultural institution than the world's museums of art, history, science and natural science, zoos, aquariums and botanical gardens. They offer a wide range of largely untapped opportunities for participation in international exchange. The accomplishments of S.C.I. over the past quarter of a century are impressive. Together, museums and their counterparts abroad can forge productive international linkages through Sister Cities International. Museums should contact their local Sister City committee and explore ways in which they can assist in advancing the aims of S.C.I. (Papageorge 1981, 28)

If something is worth doing, then its worth doing well. By developing written documents that state the specifics of cooperation, botanic gardens are not only aware of their stated
goals but are also able to accurately monitor their progress with respect to those goals. No doubt, documents of agreement among cooperating institutions need to have considerable flexibility built into them so as to allow for changes as the need arises (Bilder 1981), (Bryant and White 1982) and (Rondinelli 1983). Formal documents of agreement should neither be developed or perceived as constraints to the efficient, effective functioning of botanic gardens. Rather, they should serve as benchmarks against which institutions can assess the ongoing progress (Bryant and White 1982).

One of the great benefits of developing formal documents of agreement is that these written papers form a basis upon which the important concept of program evaluation takes place at the conclusion of an endeavor (Bryant and White 1982). Without concrete, written benchmarks and objectives, botanic gardens have no sure way of measuring their success with regards to international cooperation. Without keeping records on the progress of international cooperation endeavors, botanic gardens
lack any history concerning the procedures that work. They also lack any fair means of detecting and correcting errors (Rondinelli 1983) so as to make future endeavors in international cooperation more effective and profitable.

Of course the mere development of formalized documents of agreement does not automatically lead to great successes in international dealings among botanic gardens. Indeed, one of the main reasons why so many institutions in TDC's fear entering formal cooperating endeavors with foreign institutions has to do with the bureaucratic nightmares, cultural and language differences and inefficiencies especially common in dealing with institutions in TLDC's.

. . . conditions in developing nations make it highly unlikely that systematic [formalized] and centrally controlled management procedures can be made more effective. The most serious constraints include: difficulties in defining project objectives precisely at the outset; lack of appropriate data and information; inadequate understanding of local social and cultural conditions; weak incentives or controls for guiding the behavior of participants in project implementation; the dynamics of political
interaction and intervention; and the developing countries low levels of administrative capacity to plan and manage in prescribed ways. (Rondinelli 1983, 80-81)

In contacting institutions in the course of this research, a number of the staff stated that they were of the impression that they did indeed have some form of cooperation with foreign institutions, backed by documents of agreement located somewhere in their files. The problem oftentimes is that they do not know where in the files these documents are currently located. Eloff (1987) states that successful endeavors are not only based on mutual consensus and written agreements, they must also have such a priority as to be a daily part of the institution's operation.

This thesis is intended to provide information to botanic garden professionals so they become more aware of the various concepts surrounding the world of international cooperation so as to better serve the current and future interests of their profession. Botanic gardens need to explore world alternatives to
the common problems that they face including the isolation (Burgard 1983), parochialism (Papageorge 1982) duplication of activities (de Jong, van Vliet and Wijands 1983(?)), lost influence (Brockway 1979) general lack of communication and common funding problems under which they currently operate. As Larsen (1984) and the International Union for Conservation of Nature and Natural Resources (1987) states, botanic gardens must weld themselves into a network of international cooperation. To be effective, cooperation must involve some commitment. Commitments are best stated formally and in writing so as to foster clarity and efficiency (Bilder 1981).

C. Some Ideas on Writing Agreements

One of the best documented agreements that I read in the course of research is the agreement that exists between the Desert Botanical Garden, Phoenix, Arizona, USA and the Centro de Investigacion y Desarrollo de los Recursos Naturales de Sonora (CIDESON), Mexico. Included in this thesis as Appendix H on page 277, this agreement is a partnership type of arrangement. This
type of agreement was entered into by both parties with the feeling that it was most appropriate for their needs, abilities and interests, given their desire to form an agreement with some long-range permanence attached to it (Nabhan 1987).

The agreement begins by clearly stating the parties involved in the cooperation endeavor and then making a statement identifying the nature of this document; a collaborative agreement between the Desert Botanical Garden and CIDESON.

Clause number one of the agreement targets the main reasons for cooperating, namely mutually beneficial plant conservation and associated activities.

The second and third clauses are important in that they place into perspective the specific project needs with a more national, holistic set of program needs, implying that this agreement is viewed as a small part of a greater cooperation between the USA and Mexico. It is important to develop and state such an awareness in documents of agreement among institutions.
projects should be tied closely to national programs. Programs are collections of projects, and it is a mistake to consider a project, or worse to design a project, in isolation from the program of which it is a part. (Bryant and White 1982, 108)

Clause number four spells out some of the basic ways that cooperation will proceed, the emphasis being placed on plant conservation and public education. It is important to note that the seven items of cooperation listed under this clause represent important items that the cooperating parties felt compelled to list. They state however that cooperation is not limited to these seven items.

Both the fifth and ninth clauses deal with the potentially difficult area of funding. The key theme of both these clauses centers on the concept of joint responsibilities when it comes to financial matters.

Clause number six is really indicative of the seriousness with which both the Desert Botanical Garden and CIDESON are approaching this agreement of cooperation. This clause actually
provides for the naming of coordinators at each institution for the purpose of facilitating and overseeing the cooperation process.

The seventh clause encourages communication through literature and computerized information exchanges.

The eighth clause is innovative in that it provides for each institution to act as an advocate for the other in matters pertaining to bureaucracies and procedures encountered by its foreign counterpart in dealing with governments and national policies.

Clause number ten specifically limits the agreement to those signatory parties, personalizing the arrangement. No proxy is accepted unless agreed upon by the cooperating member.

The eleventh clause assures that mutual benefits will be derived from the cooperation. It is placed here as an assurance that the cooperation is not intended to be a unilaterally beneficial venture.
Finally, the twelfth clause is included for legal reasons. This item serves three functions; it places a time limit on the agreement, allows for the early termination of the agreement and stipulates that the agreement is in no way a legally binding arrangement. The concept of placing a short time limit on agreements is viewed as a technique in risk-management since it is felt that, by-in-large, shorter duration agreements follow foreseeable paths of greater predictability and the venture becomes less costly if indeed the agreement proves to be unprofitable for any of the participants (Bilder 1981). Likewise, the provision to terminate the agreement in ninety days for any reason by either party is also viewed as a risk-management technique (Bilder 1981). The indication that the agreement is not a legally binding venture goes far in alleviating any concerns that an institution may have about feeling constrained to an unproductive effort. International development experts usually assume that international agreements are not legally binding unless the cooperating parties state their intentions to develop a
Whenever we are confronted with any international act the natural question we should ask is - did the parties intend that the agreement should create or declare legal rights and obligations between them? It is an essential element of a contract or an agreement that there should be an intention to create legal rights and obligations between the parties. If this intention is lacking, there is no act in the law, though there may still be an agreement in the eyes of the moralist or sociologist. The intention to create legal relations is an intention to create rights and obligations which may be declared or enforced in a court of law. There is a presumption that parties, who have expressed their agreement consistently with the rules for the formation of contracts, intend to create legal relations between themselves. (Osakwe 1971, 176)

The agreement between the Desert Botanical Garden and CIDESON is ultimately signed and dated to seal this arrangement of good faith. It is important to note here that according to Nabhan (1987) the agreement between these two institutions is developed in both English and Spanish languages. This is an important tenet of international cooperation. Though English is currently professed as being the language of international development, truly successful cooperation, in a cultural sense,
involves an effort by all concerned to express themselves adequately in the languages of all parties involved in a cooperative endeavor.

The Desert Botanical Garden/CIDESON agreement follows, very closely, the pattern for a "standard agreement" (van Wouw 1971, 110), the basic guidelines of which are provided in this thesis as Appendix I, page 281.

Howard et al. (1964) and Heywood (1964) do an excellent job of providing procedural information for the development of *Indices Seminum*. Occasionally, institutions that share similar climates or plant interests may desire to arrange for a more targeted and formalized policy of seed exchange among themselves as opposed to the broadcast nature by which most *Indices Seminum* are sent out.

Appendix J, on page 284, is provided as an example of a targeted seed exchange agreement between the University of Wisconsin Arboretum, Madison, Wisconsin, USA and the
Heilongjiang Forestry Botanical Garden, Heilongjiang, the People's Republic of China. This document is developed as a series of suggested guidelines and is written in a very informal manner. Its intention is clearly limited to guiding and recommending. Though each of the six items of cooperation stated in this document are of importance, it is the sixth item that has international potential. This item provides a suggestion that the University of Wisconsin Arboretum and the Heilongjiang Forestry Botanical Garden each act as regional intermediaries with respect to other institutions that may desire to engage in mutual cooperation with the above.

Osakwe (1971) indicates that international agreements, both formal and informal, may be developed in a variety of formats depending on the particular needs of the cooperating institutions. What is presented here are just a few of the many possible forms that may be followed by botanic gardens interested in written documents of agreement to support their international endeavors. It is hoped that this will stimulate the
kind of preliminary activities and personal research that institutions need to engage in to develop appropriate written documents of agreement that meet their individual needs in the area of international cooperation.
CONCLUSION

The concept of international cooperation among botanic gardens is not a new phenomenon. Eighty-four percent (84%) of the respondents to the survey (Appendix A, page 172) provided positive feedback concerning cooperation and 77% of the respondents actually engaged in activities with foreign institutions.

The reasons for international cooperation among botanic gardens are many. At least seventeen reasons are brought forth in this research. In reiteration, they are as follows:

1) Collectively addressing issues that are too large for botanic gardens to deal with individually.

2) Insuring a continuous, international flow of plant resources.

3) Increasing the technical productivity of ventures in foreign nations.

4) Facilitating the administration of international activities.
5) Insuring for the appropriate and successful transfer of technology, plant materials and information.

6) Pooling limited resources to effectively address common concerns.

7) Reducing duplications in effort, often the result of institutional isolationism.

8) Developing logical divisions of labor among institutions with similar goals.

9) Standardizing activities that affect all botanic gardens so that each institution can readily contribute to the common good and easily reap the benefits.

10) Obtaining expertise that is not locally available.

11) Positioning botanic gardens to obtain sources of outside funding by presenting an image of coordination.

12) Recapturing preeminence in all aspects of the plant sciences by developing a healthy, worldwide network of botanic gardens.
13) Reducing parochialism, often the result of institutional isolationism.

14) Establishing and supporting organizations and institutions to serve the common good of all botanic gardens.

15) Defining and redefining relationships with foreign institutions based on a mutuality of benefits rather than any sort of unilateralism.

16) Showing solidarity and equality with all botanic gardens worldwide.

17) Exercising the moral obligation of assisting kindred institutions.

Many botanic gardens are often in a quandary as to how to commit themselves to international cooperation both practically and procedurally. The daily operation of a botanic garden seems to take priority over things such as international cooperation, the latter sometimes being perceived as superfluous. If this is indeed the case with many institutions, then the future that botanic gardens face is one of great uncertainties.
Botanic garden professionals need to approach the concept of international cooperation with the same amount of energy, innovation, commitment and vision with which they approach other tasks facing their institutions. When the need for added personnel, coupled with the lack of adequate funding to hire new staff, threatened many botanic gardens, the institutions responded with creative volunteer programs that have profited botanic gardens many times over. Today, isolation and parochialism also threaten the world's botanic gardens. Botanic gardens need to respond in innovative ways that expand their sense of involvement well beyond their own garden's walls.

In one of his last, internationally published articles, the late Peter Lapin, Director of the Main Botanical Garden, Moscow, USSR, left us with this visionary hope for a better tomorrow, based on international understanding.

All this clearly shows the fruitful role of different co-operation forms between Botanic Gardens on the national and international levels for the successful fulfillment of their great objectives in the study,
rational utilization and protection of plant resources for the sake of mankind's well-being and strong peace on Earth. (Lapin 1985, 5)
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APPENDICES
Appendix A

Survey Results:
International Cooperation
Among Botanic Gardens
In 1987 I conducted a survey into the concept of international cooperation among botanic gardens. The survey questionnaire was sent to 300 botanic gardens, representing approximately 20-25% of such institutions known to exist at this time (Henderson 1983). A total of 89 countries were included in this survey.

The purpose of this survey was to obtain first-hand information as to the nature, extent and quality of international cooperation among botanic gardens. It was also designed in such a way as to allow the responding institutions a forum for the presentation of ideas pertinent to cooperation.

Appendix A is divided into four subsections. These subsections describe the following:

Appendix A (1): An example of the survey questionnaire used. (Reduced from the original size for purposes of format for inclusion in this thesis).

Appendix A (2): A listing of the nations that were sent the survey.
Also included is an indication of the number of institutions in each nation that received a questionnaire as well as the number that actually responded to the survey.

Appendix A (3): The survey results.

Appendix A (4): A listing of some of the comments made by the survey respondents. Emphasis being placed on recurring themes or particularly useful ideas.
Appendix A (1)

The Survey Questionnaire
INTERNATIONAL COOPERATION
BOTANIC GARDENS, ARBORETA & RELATED INSTITUTIONS
RESEARCH QUESTIONNAIRE

This questionnaire is being sent to 300 Botanic Gardens, Arboreta and Related Institutions world-wide as part of a research survey into the concept of international cooperation among the aforementioned types of institutions. Please take just a few moments to assist in this endeavor by completing and returning the following survey.

Institution’s Name: ____________________________________________
Address: ____________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
Telephone Number: ____________________________________________
Director or Contact Person’s Name: ________________________________

1) How would you classify your institution? (Check one):
   a) Botanic Garden: .................................................. □
   b) Arboretum: ...................................................... □
   c) Horticultural Display Garden: ................................. □
   d) Environmental/Conservation Institution: .............. □
   e) Other (Please specify): ________________________________

2) Describe your institution’s affiliation. (Check one):
   a) National Government: .......................................... □
   b) Local Government: ............................................ □
   c) Joint Local Government & University: ................... □
   d) University: ....................................................... □
   e) Private: ............................................................ □
   f) Other (Please Specify): ________________________________
3) Is your institution and/or any of its members *currently* engaged in any form of international cooperation with institutions in a *foreign country*? (Check one):
   a) Yes: □
   b) No: □

4) Was your institution and/or any of its members *formerly* engaged in any form of international cooperation with institutions in a *foreign country*? (Check one):
   a) Yes: □
   b) No: □

*If you answered YES to one or both of question *'s 3 or 4, please continue with question *'s 5 (Located on the next page)*:

*If you answered NO to BOTH question *'s 3 and 4, please SKIP to question *'s 13 (Located on page *'s 6)*:
5) How would you describe the nature of your institution's international cooperation venture(s)? (Check all that apply):

a) Cooperating in Plant Exploration & Introduction: □

b) Seed & Plant Materials Exchanges: □

c) Herbarium Exchanges: □

d) Plant & Genetic Resources Conservation: □

e) Personnel Exchanges: □

f) Information and Literature Exchanges: □

g) Cooperating in conferences, seminars & meetings: □

h) Assistance in Foreign Institution Development: □

i) Other(s): (Please Specify): __________________________

6) What are the practical and philosophical reasons for your institution's interest in international cooperation? (Please describe below; feel free to continue comments on page 8 if extra space is needed):

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

7) Using your own definition, would you describe the cooperation mentioned in question #5 as being formal or informal? (Check one):

a) Formal cooperation: ........................................................... □

b) Informal cooperation: .......................................................... □
8) Please complete the following for all foreign institutions with whom you currently have, or formerly have had, some form of international cooperation:*

Institution's Name & Country: ________________________________

Current or Former cooperation (Please check one):
  Current: ........... □
  Former: ............ □

Formal or Informal cooperation (Please check one):
  Formal: ............ □
  Informal: ............ □

Briefly describe the nature of cooperation (From question #5):

_________________________________________________________________
_________________________________________________________________

Approximate dates of cooperation: ________________________________

If cooperation is inactive or discontinued, please state the reason(s) for this action:

_________________________________________________________________
_________________________________________________________________

........................................................................................................

Institution's Name & Country: ________________________________

Current or Former cooperation (Please check one):
  Current: ........... □
  Former: ............ □

Formal or Informal cooperation (Please check one):
  Formal: ............ □
  Informal: ............ □

Briefly describe the nature of cooperation (From question #5):

_________________________________________________________________
_________________________________________________________________

Approximate dates of cooperation:

If cooperation is inactive or discontinued, please state the reason(s) for this action:

_________________________________________________________________
_________________________________________________________________

* (Please feel free to use the extra space provided on page 8 if needed).
9) Do any written documents of agreement exist between your institution and any foreign institution(s) with whom you are, or at one time were, cooperating? (Please check one):

a) Yes, with all institutions with whom we are cooperating: □

b) Yes, with some institutions with whom we are cooperating: □

(if yes in at least one case, please continue with question #10 below).

c) No: □

(if no, please proceed to question #12, located on the next page).

10) List the names and country locations of institutions with whom you have written documents of agreement for the purpose of international cooperation:

Institution's Name & Country: ______________________________

Institution's Name & Country: ______________________________

* (Please feel free to use the extra space provided on page 8 if needed).

11) For the purpose of this research, is it possible for you to provide me with examples of any of your documents of agreement with respect to your international cooperation with a foreign institution(s)? (Please check any that apply):

a) Yes; examples attached to this research questionnaire reply: ... □

b) Yes; examples shall follow in a separate mailing: ..................... □

c) Contact me personally with regards to this request: ..................... □

d) No: __________________________________________________________ □

(Please proceed to question #14)
12) If there are no documents of agreement with respect to current or former international cooperation between your institution and a foreign institution, please indicate why. (Check any that apply):

a) A verbal agreement is sufficient in our case: □
b) Written agreements require too much administrative time and effort: □
c) Institution not prepared for the commitment that a written agreement would require: □
d) Other reason(s): (Please specify). __________________________

(Please proceed to question #14)

13) If your institution has never been involved in any form of international cooperation, please speculate as to the reasons for this decision. (Check any that apply):

a) Opportunities to cooperate internationally have never arisen: □
b) No reason for our institution to cooperate internationally at this time: □
c) International cooperation is not part of our stated mission: □
d) Institution does not have the resources needed to cooperate internationally: □
e) Other reason(s): (Please specify). __________________________

(Please proceed to question #14)
14) • What are your opinions about the concept of international cooperation between Botanic Gardens, Arboreta, etc.?
• Do you foresee international cooperation as being a part of the future of your profession, your organization?
• If you already cooperate internationally, what ADVICE do you have for someone interested in beginning such a venture?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

* (Please feel free to use the extra space provided on page 8 if needed).

15) Do you wish to receive a report on the results of this survey? (Check one):

Yes: ... □
No: ..... □

I express my sincere thanks to you for taking the time to complete this research questionnaire. Please return the completed survey in the envelope provided.


ERICH S. RUDYJ
LONGWOOD GRADUATE PROGRAM
153 TOWNESEND HALL
UNIVERSITY OF DELAWARE
NEWARK, DE 19717-1303
U.S.A.
Extra Space For Additional Comments:
Appendix A (2)

An International Profile of Institutions Surveyed
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Totals:

Nations included in survey: 89
Number of institutions surveyed: 300
Number and percentage of institutions responding: 128 (43%)
Number and percentage of nations responding: 47 (53%)
Appendix A (3)

Survey Results
In the following tabulation of survey results, percentages are given first followed by the absolute number of respondents relative to each category. Each statistic is a percentage of the total number of institutions responding to this survey.

**STATISTICS**

Number of institutions surveyed: **300**

Number of institutions responding: **43% (128 out of 300)**

Professional classification of responding institutions:

~ Botanic Garden: **65% (83 out of 128)**

~ Arboretum: **16% (21 out of 128)**

~ Horticultural Display Garden: **7% (9 out of 128)**

~ Environmental/Conservation Institution: **3% (4 out of 128)**

~ Other* (Some examples below): **9% (11 out of 128)**

*Forest Research Organizations

*Zoological/Botanic Gardens

*Pharmacological Institutions
Professional affiliation of responding institutions:

~ University: 28% (36 out of 128)
~ Local Government: 24% (31 out of 128)
~ Private or Not-For-Profit: 20% (26 out of 128)
~ National Government: 20% (26 out of 128)
~ Joint Local Government and University: 4% (5 out of 128)
~ Other*: 3% (4 out of 128)

* Combinations of several of the above affiliations

Do responding institutions cooperate internationally?

~ YES: 77% (98 out of 128)
~ NO: 23% (30 out of 128)
If YES to international cooperation, what is the type of cooperation claimed? (An institution may respond in more than one category).

- Seed and plant material exchanges: 72% (92 out of 128)
- Information and literature exchanges: 50% (64 out of 128)
- Seminars and conferences: 40% (51 out of 128)
- Plant exploration and introduction: 38% (49 out of 128)
- Herbarium exchanges: 38% (49 out of 128)
- Plant conservation: 30% (39 out of 128)
- Personnel exchanges: 25% (32 out of 128)
- Foreign institution development: 16% (20 out of 128)
- Other* (Some examples below): 4% (5 out of 128)
  * Specialized training of students
  * International plant evaluation trials

If YES to international cooperation, is the claimed cooperation formal or informal?

- Formal: 42% (54 out of 128)
- Informal: 34% (44 out of 128)
If YES to international cooperation, do documents of agreement exist?

- No documents of agreement exist: 59% (75 out of 128)
- Documents of agreement do exist: 18% (23 out of 128)

If no documents exist for international cooperation, why not? (An institution may respond in more than one category. Some respondents chose not to answer this question).

- Verbal agreement is sufficient: 27% (35 out of 128)
- Documents require excessive administration: 8% (10 out of 128)
- Not ready to commit to written agreements: 8% (10 out of 128)
- Other* (Fourteen reasons given other than those stated above, some common examples below): 24% (31 out of 128)
  - * Documents not required for some types of cooperation.
  - * Cooperation very informal.
  - * Written agreements forthcoming.
  - * Relationships based on mutual trust.
  - * Cooperation should be free and voluntary.
If NO to international cooperation, why not? (An institution may respond in more than one category).

~ Resources insufficient: 13% (16 out of 128)

~ Opportunity has never arisen: 9% (12 out of 128)

~ No reason to cooperate internationally: 3% (4 out of 128)

~ International cooperation not part mission: 2% (3 out of 128)

~ Other: 2% (3 out of 128)

Did responding institution provide written opinions or advice concerning international cooperation?

~ YES: 84% (107 out of 128)

~ NO: 16% (21 out of 128)
Appendix A (4)

Representative/Noteworthy Comments
My survey into international cooperation among botanic gardens resulted in 84% of the respondents providing me with some sort of written advice pertinent to cooperation. Following are examples of representative/noteworthy comments received from botanic gardens worldwide. Comments are placed under categories to which they pertain.

Agreement Development:

"I would advise those initiating cooperation to ensure that each party is clear on the level of commitment each is to make."

- Australian National Botanic Gardens
  Canberra, ACT, Australia

"[What is important in international cooperation is] Negotiating friendly and frankly (NFF)."

- Nanjing Botanical Garden
  Mem. Sun Yat-Sen, Nanjing
  People's Republic of China

"Our advice is that anyone entering this field should have clarified and set his aims beforehand."

- Hortus Botanicus
  Reykjavikensis
  Reykjavik, Iceland
Agreement Development (continued):

"Stand proud, seek a partnership and show what you are able to do or offer. Keep evaluating the expectations and achievements of both groups."

- Timaru Botanical Garden
  Timaru, New Zealand

"Cooperation must be permanent."

- Central Republic
  Botanical Garden
  Kiev, Ukrainian S.S.R.

Commercialism:

"International cooperation among botanic gardens is a must and in no way should lead into a commercial undertaking."

- Bogor Botanic Garden
  Bogor, Indonesia

Communication:

"International cooperation will grow in importance as electronic mail becomes cheaper and efficient."

- University Botanical Garden
  Hebrew University
  Jerusalem, Israel
Conferences:

"The best link is personal friendship and correspondence as well as meetings for personal contacts."

- Palmengarten
  Frankfurt am Main
  Federal Republic of Germany

Conservation Issues:

"Global conservation issues as they relate to botanic gardens are the business of everyone."

- Botanic Gardens/Herbarium
  Adelaide, South Australia

"International cooperation between botanic gardens, arboreta, etc. is obligatory if we shall ever be able to monitor conservation and utilization of the world's plant resources."

- The Norwegian Arboretum
  Store Milde, Norway

"We are members of [the IUCN's] Botanic Gardens Conservation Secretariat - we find this type of cooperation of a mutual value."

- Botanical Garden
  University of Uppsala
  Uppsala, Sweden
Conservation Issues (continued):

"Only with this cooperation on a global level [can we] save our planet, strengthen the activity on the protection of the environment, protection of rare and endangered plant species, etc."

- Main Botanical Garden
  Moscow, U.S.S.R.

Coordination of Efforts:

"It would be of great interest to get a specialized, centralized institution for international cooperation."

- Jardin Exotique de Monaco
  Principality of Monaco

"[A purpose of international cooperation is to] share in the goal of preserving uncommon species at various institutions on each continent."

- Mildred E. Mathias
  Botanical Garden
  Los Angeles, California
  United States of America
Diplomacy:

"Philosophically, cooperation between countries in this regard [botanic gardens] is satisfying in promoting international relations and good will."

- Los Angeles State and County Arboretum
  Los Angeles, California
  United States of America

Display Horticulture:

"International cooperation [for purposes of exchanging] information on plant materials culture, identification and [as a] source for new display specimens is of the most value to us at present."

- Phipps Conservatory
  Pittsburgh, Pennsylvania
  United States of America

Duplication of Efforts:

"International cooperation may generally help to reduce the duplication of scientific work in areas such as the Amazon Basin which have so much unknown [plant materials] hence efforts are [concentrated] meaningfully while providing data in specific areas."

- Botanical Gardens
  Georgetown, Guyana
Duplication of Efforts (continued):

"It [international cooperation] would be a marvelous way to share resources and avoid unnecessary duplication of effort. Could also be a significant method of staying current."

- Leu Botanical Gardens
  Orlando, Florida
  United States of America

Formalizing Agreements:

"For some period, informal cooperation by [the] direct contacting [of] people in gardens may be successful. Later on, or in other circumstances, a formal agreement can be necessary."

- University Botanic Gardens
  Utrecht, The Netherlands

"Any formal cooperation involving substantial time and money should be based on a written agreement."

- Strybing Arboretum and Botanical Garden
  San Francisco, California
  United States of America
Funding Issues:

"International cooperation of botanical gardens is extremely helpful. In our case it is kept on almost zero level due to lacking foreign currency to cover membership allowance or conference fee."

- Botanical Garden/Arboretum
  University of Agriculture
  Brno, Czechoslovakia

"Often assistance and participation [internationally] brought in funds that would not have been available otherwise."

- University Botanical Garden
  Hebrew University
  Jerusalem, Israel

"I believe that cooperation should be part of the mission of every botanic garden. However, the sad state of funding for probably 85-90% of them prevents them from conducting this basic function. We can only do cooperative programs if we are very creative in raising money for this purpose."

- Memphis Botanic Garden
  Memphis, Tennessee
  United States of America
Idea Exchanges:

"Personnel exchanges have never been [tried] with us. This is highly recommended for small, insular gardens like ours."

- Argotti Botanic Garden
  Floriana, Malta

"We need it, a botanical garden must never be an isolated thing of its own. [Furthermore] we think that we can give other botanical gardens some help or advice from our experience."

- Botanical Garden
  University of Uppsala
  Uppsala, Sweden

Image Development:

"[International cooperation] will greatly add to the public image of our profession and enhance the impact of our work."

- University Botanical Garden
  Hebrew University
  Jerusalem, Israel

"[Bi-national agreements] will become a major means to assess the value and achievement of institutions."

- University Botanical Garden
  Hebrew University
  Jerusalem, Israel
Informal Cooperation:

"Gardens have a long tradition in exchange without official regulations, just helping each other as much as possible."

- University Botanic Gardens
  Utrecht, The Netherlands

Initiating Cooperation:

"It is easy to accept cooperation ideas in theory but more difficult to establish them in practice."

- Botanical Garden
  University of Turku
  Turku, Finland

"Do it! I think many people are waiting for a cooperation [experience], one just has to do the first step."

- Botanischer Garten
  der Universität Bonn, Bonn
  Federal Republic of Germany

"Begin [international cooperation] with informational exchanges and seed exchanges, follow through with staff interchanges, attend foreign meetings."

- The Holden Arboretum
  Mentor, Ohio
  United States of America
Institution Building:

"[A practical reason for cooperation is] to assist new institutions to develop programs suited for their needs and conditions."

- Australian National Botanic Gardens
  Canberra, ACT, Australia

"[We cooperate internationally] to encourage conservation and botanic gardens in areas where it can be least afforded, but usually most necessary."

- Trinity College Botanic Gardens
  Dublin, Eire

"The resources of Papua New Guinea are limited in terms of funds, expertise and personnel to study and curate a flora that is largely unknown and undocumented by the standards of developed countries. International cooperation and exchange helps fill this void."

- National Herbarium and National Botanic Garden
  Lae, Papua New Guinea
Institution Building (continued):

"[International cooperation] is especially important, as the first-world botanic gardens are in a position to keep out third-world botanic gardens. Such [cooperation] is especially critical today because of economic constraints in third-world institutions. Our over interest is to build bridges and develop relationships between institutions around the world who have similar interests to [ours]."

- New York Botanical Garden
  New York, New York
  United States of America

Interdependence:

"Being a garden dedicated to plant introduction, we need the support and advice of everyone [internationally] and are dependent on good will, consulting and staff exchange to improve our own standards and to contribute to others when this is needed or appropriate."

- University Botanical Garden
  Hebrew University
  Jerusalem, Israel

Isolationism:

"International cooperation should continue as no institution can exist and hope to progress in isolation."

- Forest Research Institute
  Kuala Lumpur, Malaysia
Language Issues:

"We think it is necessary to cooperate internationally, but we can not afford it and, to our regret, we do not have any staff who is good at a foreign language."

- National Garden
  Shinjuku Gyoen
  Tokyo, Japan

Mission Statements:

"[International cooperation] should be beneficial in most cases. Our limited research and collection policies prevents us from being a 'player'."

- The Bloedel Reserve
  Bainbridge Island, Washington
  United States of America

"Our mission statement is very broad, international efforts would be based in the distant future as our focus is mostly local at this time."

- Tuscan Botanical Gardens
  Tuscan, Arizona
  United States of America
Mutuality of Benefits:

"Cooperation should be to the mutual benefit of each party."

- Otari open-air
  Native Plant Museum
  Wellington, New Zealand

"International cooperation will be a strong positive force strengthening all institutions involved if it is carried [out] professionally."

- Strybing Arboretum and
  Botanical Garden
  San Francisco, California
  United States of America

Personal Contacts:

"It [international cooperation] depends very much on simple human contact."

- Botanische Garten
der Universität Zürich
  Zürich, Switzerland

"I would advise that international cooperation is, most times, the result of individual relationships dealing with mutual problems rather than institutional or governmental relationships."

- State Botanical Garden
  Athens, Georgia
  United States of America
Personnel Exchanges:

"There are some major difficulties in exchange of personnel, mainly due to cost."

- Australian National Botanic Gardens
  Canberra, ACT, Australia

"As funds are getting harder to come by, instead of travel, [botanic gardens] will be more dependent on close [international] cooperation with [their] colleagues."

- University Botanical Garden
  Hebrew University
  Jerusalem, Israel

"Exchange [international] of technical personnel in the early and intermediate stages of their professional development and maturation has been most useful in improving staff performance, education and morale at our botanic garden."

- University Botanical Garden
  Hebrew University
  Jerusalem, Israel

"[We cooperate internationally] to get expertise, provide opportunities for foreign scientists to work in the tropics and to train local staff."

- Royal Botanic Gardens
  Peradeniya, Sri Lanka
Plant Materials Exchanges:

"As the Icelandic flora contains less than 500 species of vascular plants one of the main purposes of our Botanic Garden is to seek foreign hardy species that are likely to thrive in our climate. These are the practical reasons [for international cooperation]. Philosophically we believe that international exchange of knowledge in this field as in so many others will in the end lead to a better understanding of our planet as a whole."

- Hortus Botanicus Reykjavikensis
  Reykjavik, Iceland

"When working with exotics it is not possible to do without international cooperation. Not only exchange of materials is essential but also exchange of ideas."

- The Kórnik Arboretum
  Kórnik, Poland

Post-Colonial Efforts:

"Our botanic garden should have cooperation with botanic gardens in Zaire [formerly the Belgian Congo]. Contacts however are very difficult."

- Jardin Botanique National de Belgique
  Meise, Belgium
Scientific Exchanges:

"The basic philosophy in these [international] cooperative [efforts] is the desire to continue to grow in our scientific endeavors."

- Forest Research Institute
  Kuala Lumpur, Malaysia

Seed Exchanges:

"During the 1940's, Hoyt Arboretum benefited greatly by receiving seeds from foreign institutions. In recent years, we have had volunteers who collected seeds, thus enabling the arboretum to reciprocate."

- Hoyt Arboretum
  Portland, Oregon
  United States of America

Sistering Agreements:

"We would like to begin a program with Mexico. We have been in conversations with officials of Fullerton's sister city, Morelia, Michoacan concerning cooperative activity."

- Fullerton Arboretum
  Fullerton California
  United States of America
**Specialized Collections:**

"We specialize in a number of genera, families and plants from certain areas. So we are interested to cooperate with gardens and institutions which are also specializing in part of these taxa; exchange of material, knowledge, etc."

- University Botanic Gardens
  Utrecht, The Netherlands

"[International cooperation] provides access to living collections of specialty groups for researchers."

- Botanical Garden of the
  University of South Florida
  Tampa, Florida
  United States of America

**Voluntary Agreements:**

"A voluntary agreement where both sides perceive some advantage is more likely to succeed."

- National Herbarium and
  National Botanic Garden
  Lae, Papua New Guinea
Appendix B

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
CONVENTION ON INTERNATIONAL TRADE
IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA

Prepared and adopted by the Plenipotentiary Conference to Conclude
an International Convention on Trade in Certain Species of Wildlife
held at Washington, D.C., from 12 February to 2 March 1973

The Contracting States,

Recognizing that wild fauna and flora in their
many beautiful and varied forms are an irreplace-
able part of the natural systems of the earth which
must be protected for this and the generations to
come;

Conscious of the ever-growing value of wild
fauna and flora from aesthetic, scientific, cultural,
recreational and economic points of view;

Recognizing that peoples and States are and
should be the best protectors of their own wild
fauna and flora;

Recognizing, in addition, that international co-
operation is essential for the protection of certain
species of wild fauna and flora against over-exploi-
tation through international trade;

Convinced of the urgency of taking appropriate
measures to this end;

Have agreed as follows:
ARTICLE I
Definitions

For the purpose of the present Convention, unless the context otherwise requires:

(a) "Species" means any species, subspecies, or geographically separate population thereof;
(b) "Specimen" means:
   (i) any animal or plant, whether alive or dead;
   (ii) in the case of an animal: for species included in Appendices I and II, any readily recognizable part or derivative thereof; and for species included in Appendix III, any readily recognizable part or derivative thereof specified in Appendix III in relation to the species; and
   (iii) in the case of a plant: for species included in Appendix I, any readily recognizable part or derivative thereof; and for species included in Appendices II and III, any readily recognizable part or derivative thereof specified in Appendices II and III in relation to the species;
(c) "Trade" means export, re-export, import and introduction from the sea;
(d) "Re-export" means export of any specimen that has previously been imported;
(e) "Introduction from the sea" means transportation into a State of specimens of any species which were taken in the marine environment not under the jurisdiction of any State;
(f) "Scientific Authority" means a national scientific authority designated in accordance with Article IX;
(g) "Management Authority" means a national management authority designated in accordance with Article IX;
(h) "Party" means a State for which the present Convention has entered into force.
ARTICLE II
Fundamental Principles

1. Appendix I shall include all species threatened with extinction which are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances.

2. Appendix II shall include:
   (a) all species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival; and
   (b) other species which must be subject to regulation in order that trade in specimens of certain species referred to in sub-paragraph (a) of this paragraph may be brought under effective control.

3. Appendix III shall include all species which any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation, and as needing the cooperation of other parties in the control of trade.

4. The Parties shall not allow trade in specimens of species included in Appendices I, II and III except in accordance with the provisions of the present Convention.
ARTICLE III

Regulation of Trade in Specimens of Species included in Appendix I

1. All trade in specimens of species included in Appendix I shall be in accordance with the provisions of this Article.

2. The export of any specimen of a species included in Appendix I shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met:

(a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species;

(b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora;

(c) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment;

(d) a Management Authority of the State of export is satisfied that an import permit has been granted for the specimen.

3. The import of any specimen of a species included in Appendix I shall require the prior grant and presentation of an import permit and either an export permit or a re-export certificate. An import permit shall only be granted when the following conditions have been met:

(a) a Scientific Authority of the State of import has advised that the import will be for purposes which are not detrimental to the survival of the species involved;

(b) a Scientific Authority of the State of import is satisfied that the proposed recipient of a living specimen is suitably equipped to house and care for it;

(c) a Management Authority of the State of import is satisfied that the specimen is not to be used for primarily commercial purposes.

4. The re-export of any specimen of a species included in Appendix I shall require the prior grant and presentation of a re-export certificate. A re-export certificate shall only be granted when the following conditions have been met:

(a) a Management Authority of the State of re-export is satisfied that the specimen was imported into that State in accordance with the provisions of the present Convention;

(b) a Management Authority of the State of re-export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment;

(c) a Management Authority of the State of re-export is satisfied that an import permit has been granted for any living specimen.
5. The introduction from the sea of any specimen of a species included in Appendix I shall require the prior grant of a certificate from a Management Authority of the State of introduction. A certificate shall only be granted when the following conditions have been met:

(a) a Scientific Authority of the State of introduction advises that the introduction will not be detrimental to the survival of the species involved;
(b) a Management Authority of the State of introduction is satisfied that the proposed recipient of a living specimen is suitably equipped to house and care for it; and
(c) a Management Authority of the State of introduction is satisfied that the specimen is not to be used for primarily commercial purposes.
ARTICLE IV

Regulation of Trade in Specimens of Species included in Appendix II

1. All trade in specimens of species included in Appendix II shall be in accordance with the provisions of this Article.

2. The export of any specimen of a species included in Appendix II shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met:

   (a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species;

   (b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and

   (c) a Management Authority of the State of export is satisfied that any living specimen will be prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment.

3. A Scientific Authority in each Party shall monitor both the export permits granted by that State for specimens of species included in Appendix II and the actual exports of such specimens. Whenever a Scientific Authority determines that the export of specimens of any such species should be limited in order to maintain that species throughout its range at a level consistent with its role in the ecosystems in which it occurs and well above the level at which that species might become eligible for inclusion in Appendix I, the Scientific Authority shall advise the appropriate Management Authority of suitable measures to be taken to limit the grant of export permits for specimens of that species.

4. The import of any specimen of a species included in Appendix II shall require the prior presentation of either an export permit or a re-export certificate.
5. The re-export of any specimen of a species included in Appendix II shall require the prior grant and presentation of a re-export certificate. A re-export certificate shall only be granted when the following conditions have been met:

(a) a Management Authority of the State of re-export is satisfied that the specimen was imported into that State in accordance with the provisions of the present Convention; and
(b) a Management Authority of the State of re-export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment.

6. The introduction from the sea of any specimen of a species included in Appendix II shall require the prior grant of a certificate from a Management Authority of the State of introduction. A certificate shall only be granted when the following conditions have been met:

(a) a Scientific Authority of the State of introduction advises that the introduction will not be detrimental to the survival of the species involved; and
(b) a Management Authority of the State of introduction is satisfied that any living specimen will be so handled as to minimize the risk of injury, damage to health or cruel treatment.

7. Certificates referred to in paragraph 6 of this Article may be granted on the advice of a Scientific Authority, in consultation with other national scientific authorities or, when appropriate, international scientific authorities, in respect of periods not exceeding one year for total numbers of specimens to be introduced in such periods.
ARTICLE V

Regulation of Trade in Specimens of Species included in Appendix III

1. All trade in specimens of species included in Appendix III shall be in accordance with the provisions of this Article.

2. The export of any specimen of a species included in Appendix III from any State which has included that species in Appendix III shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met:
   (a) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and
   (b) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment.

3. The import of any specimen of a species included in Appendix III shall require, except in circumstances to which paragraph 4 of this Article applies, the prior presentation of a certificate of origin and, where the import is from a State which has included that species in Appendix III, an export permit.

4. In the case of re-export, a certificate granted by the Management Authority of the State of re-export that the specimen was processed in that State or is being re-exported shall be accepted by the State of import as evidence that the provisions of the present Convention have been complied with in respect of the specimen concerned.
ARTICLE VI
Permits and Certificates

1. Permits and certificates granted under the provisions of Articles III, IV, and V shall be in accordance with the provisions of this Article.

2. An export permit shall contain the information specified in the model set forth in Appendix IV, and may only be used for export within a period of six months from the date on which it was granted.

3. Each permit or certificate shall contain the title of the present Convention, the name and any identifying stamp of the Management Authority granting it and a control number assigned by the Management Authority.

4. Any copies of a permit or certificate issued by a Management Authority shall be clearly marked as copies only and no such copy may be used in place of the original, except to the extent endorsed thereon.

5. A separate permit or certificate shall be required for each consignment of specimens.

6. A Management Authority of the State of import of any specimen shall cancel and retain the export permit or re-export certificate and any corresponding import permit presented in respect of the import of that specimen.

7. Where appropriate and feasible a Management Authority may affix a mark upon any specimen to assist in identifying the specimen. For these purposes "mark" means any indelible imprint, lead seal or other suitable means of identifying a specimen, designed in such a way as to render its imitation by unauthorised persons as difficult as possible.
ARTICLE VII

Exemptions and Other Special Provisions
Relating to Trade

1. The provisions of Articles III, IV and V shall not apply to the transit or trans-shipment of specimens through or in the territory of a Party while the specimens remain in Customs control.

2. Where a Management Authority of the State of export or re-export is satisfied that a specimen was acquired before the provisions of the present Convention applied to that specimen, the provisions of Articles III, IV and V shall not apply to that specimen where the Management Authority issues a certificate to that effect.

3. The provisions of Articles III, IV and V shall not apply to specimens that are personal or household effects. This exemption shall not apply where:

   (a) in the case of specimens of a species included in Appendix I, they were acquired by the owner outside his State of usual residence, and are being imported into that State; or
   (b) in the case of specimens of species included in Appendix II:

      (i) they were acquired by the owner outside his State of usual residence and in a State where removal from the wild occurred;
      (ii) they are being imported into the owner's State of usual residence; and
      (iii) the State where removal from the wild occurred requires the prior grant of export permits before any export of such specimens;

   unless a Management Authority is satisfied that the specimens were acquired before the provisions of the present Convention applied to such specimens.

4. Specimens of an animal species included in Appendix I bred in captivity for commercial purposes, or of a plant species included in Appendix I artificially propagated for commercial purposes, shall be deemed to be specimens of species included in Appendix II.

5. Where a Management Authority of the State of export is satisfied that any specimen of an animal species was bred in captivity or any specimen of a plant species was artificially propagated, or is a part of such an animal or plant or was derived therefrom, a certificate by that Management Authority to that effect shall be accepted in lieu of any of the permits or certificates required under the provisions of Articles III, IV or V.
6. The provisions of Articles III, IV and V shall not apply to the non-commercial loan, donation or exchange between scientists or scientific institutions registered by a Management Authority of their State, of herbarium specimens, other preserved, dried or embedded museum specimens, and live plant material which carry a label issued or approved by a Management Authority.

7. A Management Authority of any State may waive the requirements of Articles III, IV and V and allow the movement without permits or certificates of specimens which form part of a travelling zoo, circus, menagerie, plant exhibition or other travelling exhibition provided that:

   (a) the exporter or importer registers full details of such specimens with that Management Authority;
   (b) the specimens are in either of the categories specified in paragraphs 2 or 5 of this Article; and
   (c) the Management Authority is satisfied that any living specimen will be so transported and cared for as to minimize the risk of injury, damage to health or cruel treatment.
ARTICLE VIII

Measures to be Taken by the Parties

1. The Parties shall take appropriate measures to enforce the provisions of the present Convention and to prohibit trade in specimens in violation thereof. These shall include measures:

   (a) to penalize trade in, or possession of, such specimens, or both; and
   (b) to provide for the confiscation or return to the State of export of such specimens.

2. In addition to the measures taken under paragraph 1 of this Article, a Party may, when it deems it necessary, provide for any method of reimbursement for expenses incurred as a result of the confiscation of a specimen traded in violation of the measures taken in the application of the provisions of the present Convention.

3. As far as possible, the Parties shall ensure that specimens shall pass through any formalities required for trade with a minimum of delay. To facilitate such passage, a Party may designate ports of exit and ports of entry at which specimens must be presented for clearance. The Parties shall ensure further that all living specimens, during any period of transit, holding, or shipment, are properly cared for so as to minimize the risk of injury, damage to health or cruel treatment.

4. Where a living specimen is confiscated as a result of measures referred to in paragraph 1 of this Article:

   (a) the specimen shall be entrusted to a Management Authority of the State of confiscation;
   (b) the Management Authority shall, after consultation with the State of export, return the specimen to that State at the expense of that State, or to a rescue centre or such other place as the Management Authority deems appropriate and consistent with the purposes of the present Convention; and
   (c) the Management Authority may obtain the advice of a Scientific Authority, or may, whenever it considers it desirable, consult the Secretariat in order to facilitate the decision under subparagraph (b) of this paragraph, including the choice of a rescue centre or other place.

5. A rescue centre as referred to in paragraph 4 of this Article means an institution designated by a Management Authority to look after the welfare of living specimens, particularly those that have been confiscated.
6. Each Party shall maintain records of trade in specimens of species included in Appendices I, II and III which shall cover:

(a) the names and addresses of exporters and importers; and

(b) the number and type of permits and certificates granted; the States with which such trade occurred; the numbers or quantities and types of specimens, names of species as included in Appendices I, II and III and, where applicable, the size and sex of the specimens in question.

7. Each Party shall prepare periodic reports on its implementation of the present Convention and shall transmit to the Secretariat:

(a) an annual report containing a summary of the information specified in sub-paragraph (b) of paragraph 6 of this Article; and

(b) a biennial report on legislative, regulatory and administrative measures taken to enforce the provisions of the present Convention.

8. The information referred to in paragraph 7 of this Article shall be available to the public where this is not inconsistent with the law of the Party concerned.
ARTICLE IX
Management and Scientific Authorities

1. Each Party shall designate for the purposes of the present Convention:

(a) one or more Management Authorities competent to grant permits or certificates on behalf of that Party; and
(b) one or more Scientific Authorities.

2. A State depositing an instrument of ratification, acceptance, approval or accession shall at that time inform the Depositary Government of the name and address of the Management Authority authorized to communicate with other Parties and with the Secretariat.

3. Any changes in the designations or authorizations under the provisions of this Article shall be communicated by the Party concerned to the Secretariat for transmission to all other Parties.

4. Any Management Authority referred to in paragraph 2 of this Article shall if so requested by the Secretariat or the Management Authority of another Party, communicate to it impression of stamps, seals or other devices used to authenticate permits or certificates.

ARTICLE X
Trade with States not Party to the Convention

Where export or re-export is to, or import is from, a State not a party to the present Convention, comparable documentation issued by the competent authorities in that State which substantially conforms with the requirements of the present Convention for permits and certificates may be accepted in lieu thereof by any Party.
ARTICLE XI
Conference of the Parties

1. The Secretariat shall call a meeting of the Conference of the Parties not later than two years after the entry into force of the present Convention.

2. Thereafter the Secretariat shall convene regular meetings at least once every two years, unless the Conference decides otherwise, and extraordinary meetings at any time on the written request of at least one-third of the Parties.

3. At meetings, whether regular or extraordinary, the Parties shall review the implementation of the present Convention and may:

(a) make such provision as may be necessary to
(b) consider and adopt amendments to Appendices I and II in accordance with Article XV;
(c) review the progress made towards the restoration and conservation of the species included in Appendices I, II and III;
(d) receive and consider any reports presented by the Secretariat or by any Party; and
(e) where appropriate, make recommendations for improving the effectiveness of the present Convention.

4. At each regular meeting, the Parties may determine the time and venue of the next regular meeting to be held in accordance with the provisions of paragraph 2 of this Article.

5. At any meeting, the Parties may determine and adopt rules of procedure for the meeting.

6. The United Nations, its Specialized Agencies and the International Atomic Energy Agency, as well as any State not a Party to the present Convention, may be represented at meetings of the Conference by observers, who shall have the right to participate but not to vote.

7. Any body or agency technically qualified in protection, conservation or management of wild fauna and flora, in the following categories, which has informed the Secretariat of its desire to be represented at meetings of the Conference by observers, shall be admitted unless at least one-third of the Parties present object:

(a) international agencies or bodies, either governmental or non-governmental, and national governmental agencies and bodies; and
(b) national non-governmental agencies or bodies which have been approved for this purpose by the State in which they are located. Once admitted, these observers shall have the right to participate but not to vote.
ARTICLE XII

The Secretariat

1. Upon entry into force of the present Convention, a Secretariat shall be provided by the Executive Director of the United Nations Environment Programme. To the extent and in the manner he considers appropriate, he may be assisted by suitable inter-governmental or non-governmental international or national agencies and bodies technically qualified in protection, conservation and management of wild fauna and flora.

2. The functions of the Secretariat shall be:

(a) to arrange for and service meetings of the Parties;

(b) to perform the functions entrusted to it under the provisions of Articles XV and XVI of the present Convention;

(c) to undertake scientific and technical studies in accordance with programmes authorized by the Conference of the Parties as will contribute to the implementation of the present Convention, including studies concerning standards for appropriate preparation and shipment of living specimens and the means of identifying specimens;

(d) to study the reports of Parties and to request from Parties such further information with respect thereto as it deems necessary to ensure implementation of the present Convention;

(e) to invite the attention of the Parties to any matter pertaining to the aims of the present Convention;

(f) to publish periodically and distribute to the Parties current editions of Appendices I, II and III together with any information which will facilitate identification of specimens of species included in those Appendices.

(g) to prepare annual reports to the Parties on its work and on the implementation of the present Convention and such other reports as meetings of the Parties may request;

(h) to make recommendations for the implementation of the aims and provisions of the present Convention, including the exchange of information of a scientific or technical nature;

(i) to perform any other function as may be entrusted to it by the Parties.
ARTICLE XIII

International Measures

1. When the Secretariat in the light of information received is satisfied that any species included in Appendices I or II is being affected adversely by trade in specimens of that species or that the provisions of the present Convention are not being effectively implemented, it shall communicate such information to the authorized Management Authority of the Party or Parties concerned.

2. When any Party receives a communication as indicated in paragraph 1 of this Article, it shall, as soon as possible, inform the Secretariat of any relevant facts insofar as its laws permit and, where appropriate, propose remedial action. Where the Party considers that an inquiry is desirable, such inquiry may be carried out by one or more persons expressly authorized by the Party.

3. The information provided by the Party or resulting from any inquiry as specified in paragraph 2 of this Article shall be reviewed by the next Conference of the Parties which may make whatever recommendations it deems appropriate.
ARTICLE XIV

Effect on Domestic Legislation and International Conventions

1. The provisions of the present Convention shall in no way affect the right of Parties to adopt:

   (a) stricter domestic measures regarding the conditions for trade, taking possession or transport of specimens of species included in Appendices I, II and III, or the complete prohibition thereof; or

   (b) domestic measures restricting or prohibiting trade, taking possession, or transport of species not included in Appendices I, II or III.

2. The provisions of the present Convention shall in no way affect the provisions of any domestic measures or the obligations of Parties deriving from any treaty, convention, or international agreement relating to other aspects of trade, taking, possession, or transport of specimens which is in force or subsequently may enter into force for any Party including any measure pertaining to the Customs, public health, veterinary or plant quarantine fields.

3. The provisions of the present Convention shall in no way affect the provisions of, or the obligations deriving from, any treaty, convention or international agreement concluded or which may be concluded between States creating a union or regional trade agreement establishing or maintaining a common external customs control and removing customs control between the parties thereto insofar as they relate to trade among the States members of that union or agreement.

4. A State party to the present Convention, which is also a party to any other treaty, convention or international agreement which is in force at the time of the coming into force of the present Convention and under the provisions of which protection is afforded to marine species included in Appendix II, shall be relieved of the obligations imposed on it under the provisions of the present Convention with respect to trade in specimens of species included in Appendix II that are taken by ships registered in that State and in accordance with the provisions of such other treaty, convention or international agreement.
5. Notwithstanding the provisions of Articles III, IV and V, any export of a specimen taken in accordance with paragraph 4 of this Article shall only require a certificate from a Management Authority of the State of introduction to the effect that the specimen was taken in accordance with the provisions of the other treaty, convention or international agreement in question.

ARTICLE XV
Amendments to Appendices I and II

1. The following provisions shall apply in relation to amendments to Appendices I and II at meetings of the Conference of the Parties:

(a) Any Party may propose an amendment to Appendix I or II for consideration at the next meeting. The text of the proposed amendment shall be communicated to the Secretariat at least 150 days before the meeting. The Secretariat shall consult the other Parties and interested bodies on the amendment in accordance with the provisions of sub-paragraphs (b) and (c) of paragraph 2 of this Article and shall communicate the response to all Parties not later than 30 days before the meeting.

(b) Amendments shall be adopted by a two-thirds majority of Parties present and voting. For these purposes “Parties present and voting” means Parties present and casting an affirmative or negative vote. Parties abstaining from voting shall not be counted among the two-thirds required for adopting an amendment.

(c) Amendments adopted at a meeting shall enter into force 90 days after that meeting for all Parties except those which make a reservation in accordance with paragraph 3 of this Article.

2. The following provisions shall apply in relation to amendments to Appendices I and II between meetings of the Conference of the Parties:

(a) Any Party may propose an amendment to Appendix I or II for consideration between meetings by the postal procedures set forth in this paragraph.

(b) For marine species, the Secretariat shall, upon receiving the text of the proposed amendment, communicate it to the Parties. It shall also consult inter-governmental bodies having a function in relation to those species especially with a view to obtaining scientific data these bodies may be able to provide and to ensuring coordination with any conservation measures enforced by such bodies. The Secretariat shall communicate the views expressed and data provided by these bodies and its own findings and recommendations to the Parties as soon as possible.

(c) For species other than marine species, the Secretariat shall, upon receiving the text of the proposed amendment, communicate it to the Parties, and, as soon as possible thereafter, its own recommendations.

(d) Any Party may, within 60 days of the date on which the Secretariat communicated its recommendations to the Parties under sub-paragraphs (b) or (c) of this paragraph, transmit to the Secretariat any comments on the proposed amendment together with any relevant scientific data and information.
(e) The Secretariat shall communicate the replies received together with its own recommendations to the Parties as soon as possible.

(f) If no objection to the proposed amendment is received by the Secretariat within 30 days of the date the replies and recommendations were communicated under the provisions of sub-paragraph (e) of this paragraph, the amendment shall enter into force 90 days later for all Parties except those which make a reservation in accordance with paragraph 3 of this Article.

(g) If an objection by any Party is received by the Secretariat, the proposed amendment shall be submitted to a postal vote in accordance with the provisions of sub-paragraphs (h), (i) and (j) of this paragraph.

(h) The Secretariat shall notify the Parties that notification of objection has been received.

(i) Unless the Secretariat receives the votes for, against or in abstention from at least one-half of the Parties within 60 days of the date of notification under sub-paragraph (h) of this paragraph, the proposed amendment shall be referred to the next meeting of the Conference for further consideration.

(j) Provided that votes are received from one-half of the Parties, the amendment shall be adopted by a two-thirds majority of Parties casting an affirmative or negative vote.

(k) The Secretariat shall notify all Parties of the result of the vote.

(l) If the proposed amendment is adopted it shall enter into force 90 days after the date of the notification by the Secretariat of its acceptance for all Parties except those which make a reservation in accordance with paragraph 3 of this Article.

3. During the period of 90 days provided for by sub-paragraph (c) of paragraph 1 or sub-paragraph (l) of paragraph 2 of this Article any Party may by notification in writing to the Depositary Government make a reservation with respect to the amendment. Until such reservation is withdrawn the Party shall be treated as a State not a party to the present Convention with respect to trade in the species concerned.
ARTICLE XVI

Appendix III and Amendments thereto

1. Any party may at any time submit to the Secretariat a list of species which it identifies as being subject to regulation within its jurisdiction for the purpose mentioned in paragraph 3 of Article II. Appendix III shall include the names of the Parties submitting the species for inclusion therein, the scientific names of the species so submitted, and any parts or derivatives of the animals or plants concerned that are specified in relation to the species for the purposes of sub-paragraph (b) of Article I.

2. Each list submitted under the provisions of paragraph 1 of this Article shall be communicated to the Parties by the Secretariat as soon as possible after receiving it. The list shall take effect as part of Appendix III 90 days after the date of such communication. At any time after the communication of such list, any Party may by notification in writing to the Depositary Government enter a reservation with respect to any species or any parts or derivatives, and until such reservation is withdrawn, the State shall be treated as a State not a Party to the present Convention with respect to trade in the species or part or derivative concerned.

3. A Party which has submitted a species for inclusion in Appendix III may withdraw it at any time by notification to the Secretariat which shall communicate the withdrawal to all Parties. The withdrawal shall take effect 30 days after the date of such communication.

4. Any Party submitting a list under the provisions of paragraph 1 of this Article shall submit to the Secretariat a copy of all domestic laws and regulations applicable to the protection of such species, together with any interpretations which the Party may deem appropriate or the Secretariat may request. The Party shall, for as long as the species in question is included in Appendix III, submit any amendments of such laws and regulations or any new interpretations as they are adopted.
ARTICLE XVII
Amendment of the Convention

1. An extraordinary meeting of the Conference of the Parties shall be convened by the Secretariat on the written request of at least one-third of the Parties to consider and adopt amendments to the present Convention. Such amendments shall be adopted by a two-thirds majority of Parties present and voting. For these purposes "Parties present and voting" means Parties present and casting an affirmative or negative vote. Parties abstaining from voting shall not be counted among the two-thirds required for adopting an amendment.

2. The text of any proposed amendment shall be communicated by the Secretariat to all Parties at least 90 days before the meeting.

3. An amendment shall enter into force for the Parties which have accepted it 60 days after two-thirds of the Parties have deposited an instrument of acceptance of the amendment with the Depositary Government. Thereafter, the amendment shall enter into force for any other Party 60 days after that Party deposits its instrument of acceptance of the amendment.

ARTICLE XVIII
Resolution of Disputes

1. Any dispute which may arise between two or more Parties with respect to the interpretation or application of the provisions of the present Convention shall be subject to negotiation between the Parties involved in the dispute.

2. If the dispute cannot be resolved in accordance with paragraph 1 of this Article, the Parties may, by mutual consent, submit the dispute to arbitration, in particular that of the Permanent Court of Arbitration at The Hague, and the Parties submitting the dispute shall be bound by the arbitral decision.

ARTICLE XIX
Signature

The present Convention shall be open for signature at Washington until 30th April 1973 and thereafter at Berne until 31st December 1974.

ARTICLE XX
Ratification, Acceptance, Approval

The present Convention shall be subject to ratification, acceptance or approval. Instruments of ratification, acceptance or approval shall be deposited with the Government of the Swiss Confederation which shall be the Depositary Government.

ARTICLE XXI
Accession

The present Convention shall be open indefinitely for accession. Instruments of accession shall be deposited with the Depositary Government.
ARTICLE XXII

Entry into Force

1. The present Convention shall enter into force 90 days after the date of deposit of the tenth instrument of ratification, acceptance, approval or accession, with the Depositary Government.

2. For each State which ratifies, accepts or approves the present Convention or accedes thereto after the deposit of the tenth instrument of ratification, acceptance, approval or accession, the present Convention shall enter into force 90 days after the deposit by such State of its instrument of ratification, acceptance, approval or accession.

ARTICLE XXIII

Reservations

1. The provisions of the present Convention shall not be subject to general reservations. Specific reservations may be entered in accordance with the provisions of this Article and Articles XV and XVI.

2. Any State may, on depositing its instrument of ratification, acceptance, approval or accession, enter a specific reservation with regard to:

   (a) any species included in Appendix I, II or III; or

   (b) any parts or derivatives specified in relation to a species included in Appendix III.

3. Until a Party withdraws its reservation entered under the provisions of this Article, it shall be treated as a State not a party to the present Convention with respect to trade in the particular species or parts or derivatives specified in such reservation.

ARTICLE XXIV

Denunciation

Any Party may denounce the present Convention by written notification to the Depositary Government at any time. The denunciation shall take effect twelve months after the Depositary Government has received the notification.
ARTICLE XXV

Depositary

1. The original of the present Convention, in the Chinese, English, French, Russian and Spanish languages, each version being equally authentic, shall be deposited with the Depositary Government, which shall transmit certified copies thereof to all States that have signed it or deposited instruments of accession to it.

2. The Depositary Government shall inform all signatory and acceding States and the Secretariat of signatures, deposit of instruments of ratification, acceptance, approval or accession, entry into force of the present Convention, amendments thereto, entry and withdrawal of reservations and notifications of denunciation.

3. As soon as the present Convention enters into force, a certified copy thereof shall be transmitted by the Depositary Government to the Secretariat of the United Nations for registration and publication in accordance with Article 102 of the Charter of the United Nations.

IN WITNESS WHEREOF the undersigned Plenipotentiaries, being duly authorized to that effect, have signed the present Convention.

DONE at Washington this third day of March, One Thousand Nine Hundred and Seventy-three.
A listing of those nations that are a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), accurate to 1 January 1987 (Department of State 1987).

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Zambia
Zimbabwe

NOTES:
(1) With Statement
(2) Extended to Greenland and the Faroe Islands. (Faroe Islands still in the process of enacting appropriate local legislation).
(3) Applicable to West Berlin.
(4) Concerning Kiribati and Tuvalu: Nations independent from the United Kingdom in the late 1970's; they shall observe all treaties signed for them while the British colonies, known formerly as the Gilbert and Ellis Islands Protectorate, unless they notify authorities to the contrary.
(5) Applicable to Hong Kong, the Bailiwick of Guernsey, the Bailiwick of Jersey, the Isle of Man, Bermuda, British Indian Ocean Territory, British Virgin Islands, Falkland Islands, Gibraltar, Montserrat, Pitcairn, St. Helena and Dependencies (Tristan da Cunha, Ascension Islands), Cayman Islands.
Appendix C

The Appendices to CITES
Following are Appendices I and II to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The information is current to September 1987 and is limited only to taxa of Flora:

<table>
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**Select Interpretation of Markings:**

(*) One or more geographically separate populations, subspecies or species of that species or taxon are included in Appendix I and that these populations, subspecies or species are excluded from Appendix II.
One or more geographically separate populations, subspecies or species of that species or taxon are included in Appendix II and that these populations, subspecies or species are excluded from Appendix I.

(-1) Designates all parts and derivatives, except:
   a) seeds, spores and pollen (including pollinia), and
   b) tissue cultures and flaked seedling cultures.

(-2) Designates roots and readily recognizable parts thereof.

(-3) Designates all parts and derivatives, except:
   a) seeds, spores and pollen (including pollinia),
   b) tissue cultures and flaked seedling cultures,
   c) fruits and parts and derivatives thereof of naturalized or artificially propagated plants, and
   d) separate stem joints (pads) and parts and derivatives thereof of naturalized or artificially propagated Opuntia spp. subgenus Opuntia.

(-4) Designates all parts and derivatives, except:
   a) seeds, spores and pollen (including pollinia),
   b) tissue cultures and flaked seedling cultures, and
   c) fruits and parts and derivatives thereof of naturalized or artificially propagated plants.

(-5) Designates all parts and derivatives, except:
   a) spores and pollen (including pollinia), and
   b) tissue cultures and flaked seedling cultures.

(-6) Designates all parts and derivatives, except:
   a) seeds, spores and pollen (including pollinia),
   b) tissue cultures and flaked seedling cultures, and
   c) separate leaves and parts and derivatives thereof of naturalized or artificially propagated Aloe vera.

(-7) Designates all parts and derivatives thereof, except:
   a) seeds, spores and pollen (including pollinia),
   b) tissue cultures and flaked seedling cultures,
   c) cut flowers of artificially propagated plants, and
   d) fruits and parts and derivatives thereof of artificially propagated Vanilla spp.

(+212) Population in Chile only.

(+213) All species of the family in the Americas.

(-112) Excluding the population in Chile.

(-114) Excluding all species which not succulent.

(=363) Also referenced in genus Escobaria.
(364) Also referenced in genus *Neolloydia*.

(365) Also referenced as *Nopalkochia macdeugallii*.

(366) Also referenced as *Solisia pectinata*.

(367) Includes subfamilies Apostasioidae and Cypripedioideae.

(368) Also referenced as *Lycaste skinneri var. alba*.

(369) Includes synonym *Stangeria paradoxa*.

(370) Includes synonym *Basiloxylon excelsum*.

(371) Includes synonym *Welwitschia mirabilis*. 
Appendix D

Resolutions of the Kew Conference of 1978
253

CONFERENCE ON
THE PRACTICAL ROLE OF BOTANIC GARDENS IN THE
CONSERVATION OF RARE AND THREATENED PLANTS

Agreed Conclusions

This Conference:

1. Agrees unanimously the following Resolution:

Conscious that the rich tropical floras of the world are now in great hazard,
this Conference firstly urges that a strong network of nature reserves and
conservation-orientated gardens should be established throughout the tropics
and subtropics, both through the strengthening and development of existing
foundations and through the creation of new ones where the need exists;
secondly stresses how essential it is that all countries where applicable should
have a suitable network of national regional botanic gardens to fulfil their
fundamental part in the management and conservation of natural resources,
while recognizing that reserves are the basic focus for such schemes; and
thirdly urges institutions throughout the world who are in a position to do
so, to offer all possible help in this programme through technical aid, training
and the secondment of personnel. To this third aim this Conference urges the
setting up of Fellowships to provide a reciprocal interchange between botanic
gardens for horticulturists and scientific staff in both the developed and
developing regions, with an emphasis on conservation activities, this to be
funded by the major multi-national and national corporations.

2. Calls upon the International Association of Botanic Gardens (I.A.B.G.) to
clarify its rôle and enlarge its activities, being guided wherever possible by
the suggested objectives outlined below:

1. To promote educational programmes within botanic gardens, not only on
themes of international plant conservation interest, but on all aspects of
the work of botanic gardens and their associated herbaria;

2. To encourage, and wherever possible assist in, the propagation of rare
and threatened species, especially within reserves held by other organi-
zations or by the botanic gardens themselves, and re-introduction work;

3. To promote, and if possible organize, exchange of personnel between
gardens, for training, for inclusion on local expeditions, and for increasing
general awareness among botanic gardens staff of the holdings, capacities
and operational problems and successes of other gardens;

4. To co-ordinate on a continuing basis information on specialist holdings
in botanic gardens, with the aim of reducing excessive duplication, of
making best use of existing collections, and of stimulating special collections
on a wide range of taxonomic groups both in seed banks and traditional
cultivation;
Agreed Conclusions

5. To provide information on request about relevant scientific and technical developments, lists of species maintained in cultivation (where available from gardens), expedition programmes, collecting needs, and to receive from TPC information on which plants are rare and threatened in the wild;

6. To stimulate the formation of regional groups for the interchange of ideas and pooling of resources, e.g. seed banks;

7. To establish a system of awards relating to success in achieving these targets.

3. Identifies the urgent need for an organization to promote co-operation between botanic gardens on conservation matters. It invites the Threatened Plants Committee of IUCN to take on an additional commitment, to facilitate communication through an enlarged TPC Newsletter and to circulate lists of threatened plants among gardens to find out which species are in cultivation and where, and to publish the results. The Conference suggests that this programme be funded by small annual subscriptions from botanic gardens and promises full support to a group to be set up by the TPC entitled the 'Botanic Gardens Conservation Co-ordinating Body'.

4. Requests that both guidelines for collectors and leaflets to discourage casual collecting at home and abroad be formulated, agreed and distributed; that more consideration be given to the scientific aims of expeditions, to international legislation, to contact and co-operation with the host country's botanical institutions, to advance publicity on forthcoming expeditions, to sharing more widely the material and information gathered and to the discouragement of commercial collecting, as outlined in more detail in the Report from the Working Parties (p. 8).
Appendix E

The Canary Declaration of 1985
and Recommendations
The Canary Declaration

For centuries, Botanic Gardens have been major centres for the scientific study of plant diversity, providing a mechanism for introduction and assessment of plants for agriculture, horticulture, forestry and medicine.

They attract more than 100 million visitors a year, affording havens of beauty and tranquillity for an increasingly urban society, and a spiritual link with the plant world on which we all depend.

They inform and educate; they are showcases for the living world, places where science and people meet.

For historical reasons, most Botanic Gardens are in the cooler, more industrialised countries of the world, but two thirds of all plant species occur in the tropics and subtropics. More than 60,000 species risk extinction within our lifetimes because of the destruction and degradation of the earth's vegetation, which is the basis of human survival. Recently, many of the world's Botanic Gardens have mobilised their resources for conservation action to avert this threat. They are conserving plants in the wild, cultivating them in gardens themselves, and preserving them in gene banks.

Recognising that they can only succeed in achieving these objectives if they work together, Botanic Gardens throughout the world are uniting to apply the World Conservation Strategy to the special predicament of plants. Basing their efforts on this global plan for sustainable development and conservation of living resources, they will produce, adopt and implement a Botanic Gardens Conservation Strategy.

This declaration is the result of the 1985 Las Palmas Conference on Botanic Gardens and the World Conservation Strategy, involving more than 200 leading specialists from countries throughout the world.

They as a body assert their determination to work together to defend plant life for the benefit of all people now and in the future. They call upon Governments to provide the necessary support and resources, in accordance with their responsibilities.

Las Palmas de Gran Canaria
November 1985
RECOMMENDATION 1

THE BOTANIC GARDENS CONSERVATION CONGRESS

Aware of the value of the deliberations of this Conference;

Appreciative of the most welcome support for this Conference from sponsors;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Proposes that a Botanic Gardens Conservation Congress meet every three years;

Recommends participating gardens and institutions to support the IUCN Botanic Gardens Conservation Co-ordinating Body and to provide the necessary financial support for the Body, and that this Body provides the Secretariat for the Congress;

Invites international and national agencies to help sponsor the Congress.

RECOMMENDATION 2

THE BOTANIC GARDENS CONSERVATION STRATEGY

Aware of the fundamental need that utilization of species and ecosystems be sustainable;

Appreciating that Botanic Gardens have a rôle in the conservation of living resources as a basis for sustainable development;

Recognising that Botanic Gardens need to identify and agree on the objectives and priority tasks they can undertake in implementing the World Conservation Strategy;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Considers that a Botanic Gardens Conservation Strategy is essential;

Calls on IUCN to complete the draft of the Botanic Gardens Conservation Strategy in the light of the deliberations of the Conference, to publish it and to make it as widely available as possible;

Invites the individual Botanic Gardens of the world to pledge their support for the Botanic Gardens Conservation Strategy, to identify their missions and to define the tasks that they will undertake for its implementation;

Invites IUCN to assist Botanic Gardens in setting up a Secretariat to co-ordinate and promote the implementation of the Strategy, incorporating the activities of the IUCN Botanic Gardens Conservation Co-ordinating Body, with the aim of making this Secretariat self-supporting.
RECOMMENDATION 3
WORLDWIDE NETWORK OF BOTANIC GARDENS

Acknowledging that Botanic Gardens and Arboreta are essential instruments in the conservation of plant genetic resources throughout the world;

Noting the serious imbalance between the location of Botanic Gardens and the floristic richness of the areas in which they occur;

Further Noting the small number of active Botanic Gardens in tropical countries compared with the great richness of tropical floras;

Welcoming the initiative of IUCN and IABG to collaborate on the next International Directory of Botanic Gardens;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Calls on those responsible for existing Botanic Gardens to acknowledge their Gardens' actual or potential role in genetic resource conservation, to strengthen their existing conservation activities and to take steps to guarantee the long-term survival of their Gardens;

Recommends governments and states, in association with international agencies, to review the distribution of Botanic Gardens and to recommend, where appropriate, the creation and funding of new Gardens with a major conservation mission, the emphasis being on regions with rich endemic floras, such as tropical forests and islands;

Urges the Botanic Gardens of the world to unite forces and organise themselves in such a way as to provide effective channels of communication and means of cooperation at national, regional and international levels by creating a Botanic Gardens worldwide network, in association with the International Association of Botanic Gardens (IABG).
RECOMMENDATION 4
EX SITU CONSERVATION

Recognising that no single approach to the conservation of endangered species can be relied upon;

Appreciating that *ex situ* conservation is a necessary adjunct to *in situ* conservation;

Acknowledging the importance of seed banks in the long-term conservation of genetic resources;

The International Conference on Botanic Gardens and the World Conservation Strategy:

*Urges Botanic Gardens to recognise their responsibility to maintain, propagate and make available stock of critically threatened species for scientific and horticultural research, for reintroduction (where appropriate) and to provide suitable stock for horticulture;*

*Recommends that exploration and collection of species be based on concepts of infraspecific diversity so that ecogeographical diversity and diversity between and within populations be sampled in such a way that a maximum of genetic diversity be captured and stored;*

*Urges Botanic Gardens to become involved with seed conservation and recommends that the International Board for Plant Genetic Resources (IBPGR) be approached so as to establish closer collaboration on the conservation of threatened species;*

*Recommends that every effort be made to maintain minimal international standards for seed storage and rejuvenation;*

*Recommends IUCN to continue and expand the monitoring and co-ordination of *ex situ* conservation, presently carried out by the Botanic Gardens Conservation Co-ordinating Body, as an integral part of the implementation of the Botanic Gardens Conservation Strategy;*

*Recommends Botanic Gardens and other relevant institutions to support this essential work and to provide the necessary finance for it.*

*Note: The term ‘Seed’ is used here to include spores of pteridophytes and lower plants.*
RECOMMENDATION 5

BOTANIC GARDENS IN THE TROPICS AND SUBTROPICS

Recognising that two thirds of the world flora (some 170,000 species) are in the tropics and the subtropics;

Realising that recent calculations show that at least 60,000 plant species are at risk of extinction in the next 30-40 years;

Recognising that these constitute nearly a quarter of the world's total plant species diversity;

Acknowledging that Botanic Gardens in the tropics and subtropics can help study and provide some of the vital solutions to this horrifying threat;

Convinced that Botanic Gardens can play a very important part in the conservation of the flora and the vegetation of those regions and are essential in furthering the maintenance of national plant genetic resources, both ex situ and in situ;

Being aware that many tropical and subtropical countries have Botanic Gardens that are moribund or barely function;

Realising that a further range of tropical and subtropical countries do not have a single Botanic Garden;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Urges institutions of higher learning, Governments, aid agencies and financial institutions to put more resources into existing Botanic Gardens and where necessary to establish new Botanic Gardens in the tropics and the subtropics;

Invites Botanic Gardens both in these countries and elsewhere to provide all possible training facilities and support in kind, particularly by enabling their staff to work with colleagues in the tropics and subtropics, and vice versa;

Calls upon educational and scientific institutions, Governments, bilateral and multilateral aid agencies to provide sufficient funding to facilitate this interchange of staff and technology.
RECOMMENDATION 6
PROTECTED AREAS

Aware that deforestation and destruction of ecosystems adversely affect the lives of millions of people by causing periodic flooding, scarcity of fuelwood, degradation of soil and water and reduction of agricultural productivity;

Recognising the importance of protecting a worldwide network of representative ecosystems for maintaining biological stability and diversity;

Recognising that the benefits of protecting representative ecosystems will accrue to all mankind and not just to those nations in which the ecosystems occur;

Noting that many of the Botanic Gardens of the world are caretakers of nature reserves to conserve local floras in situ, individual species or particularly important plants;

Realising that global frameworks exist in the form of Unesco’s Action Plan for Biosphere Reserves and IUCN’s Bali Action Plan, and a regional framework in IUCN’s Corbett Action Plan for Protected Areas of the Indomalayan Realm;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Recommends Botanic Gardens to take active steps to cooperate with national and international agencies responsible for protected areas so as to ensure the conservation of plants in the wild by the establishment of networks of reserves within and across national boundaries;

Urges the Botanic Gardens of the world to take an active part in aiding the conservation in situ of the floras and plants of the regions in which they are situated;

Calls upon the Botanic Gardens to cooperate with land-use agencies to provide data and to train staff in those aspects of the conservation and monitoring of flora that will aid the management of plants in protected areas.
RECOMMENDATION 7
CRITICALLY THREATENED ENVIRONMENTS

Recognising the threat confronting many fragile ecosystems consisting of highly specialised and endemic floras;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Calls upon Governments, conservation organizations and aid agencies to support Botanic Gardens and related institutions involved with the most critically threatened plant ecosystems, particularly rain forests, wetlands, Mediterranean-type vegetation like the Cape Fynbos, and island ecosystems.

RECOMMENDATION 8
PLANT RECORDS

Acknowledging that Botanic Gardens have kept plant records in various forms for centuries;

Being aware that the needs of conservation have placed even greater emphasis on full and accurate records, especially on the origins of wild source plants;

Recognising that computerisation can bring benefits of up-to-date retrieval and data exchange;

Recognising the need for the international exchange of data between gardens and between gardens and IUCN;

Appreciative of the experience of those Gardens which have computerised their plant records, for example the Botanic Garden network in the Netherlands;

Realising that many more gardens are about to computerise their records;

Considering that now is an ideal time to agree minimal data standards for the storage and exchange of plant data;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Recommends Botanic Gardens to computerise their plant records so as to aid management of their collections and to permit data exchange both between gardens and with international organisations;

Requests the IUCN Conservation Monitoring Centre to continue its work on the conceptual basis for computer record schemes and on the International Transfer Format (ITF) by further collaboration with Botanic Gardens.
RECOMMENDATION 9

AVAILABILITY OF GERM PLASM

Aware that the world community has a responsibility to conserve wild plants and their genetic diversity;

Recognising that a very wide spectrum of plant resources is necessary to combat desertification, stop erosion, restore the vegetation of degraded lands and to provide the basic materials necessary to ensure present and future supplies of food, timber, fuelwood, fibre, medicines as well as a host of other products;

Realising that plants do not recognize political frontiers and that many plants are extremely well suited for cultivation in places far from their native localities;

Certain that the success of conservation efforts to preserve useful or potentially useful plants, especially those threatened by the destruction of ecosystems, may depend upon the free exchange of germ plasm;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Recommends Governments and international organizations to facilitate the full availability of plant material of threatened species, under adequate quarantine and related measures.
RECOMMENDATION 10
CONSERVATION RESEARCH

Recognising that a sound information base, well managed and accessible, is of critical importance for effective conservation;

Further recognising the lack of available information about plants and the central rôle of taxonomy in organising this information and making it available, and that insufficient is known about the chemistry, cytology, physiology (including seed physiology), autecology, reproductive biology, methods of cultivation and propagation, which are essential for plant conservation both in situ and ex situ;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Calls upon Botanic Gardens to incorporate conservation-oriented research into their programmes as a matter of urgency, including taxonomy, chemistry, cytology, physiology (with seed physiology), autecology, reproductive biology and methods of cultivation and propagation;

Strongly endorses and reiterates to Governments, aid agencies and non-governmental organizations the calls for increased support for taxonomic and systematic research in the tropics and sub tropics;

Recommends that as a matter of urgency relevant taxonomic and associated data should be made available for Botanic Gardens and other botanic institutions, using computerised data-bases wherever possible;

Urges that Botanic Gardens and local herbaria should forge effective working links where these do not already exist.
RECOMMENDATION 11

EDUCATION AND PUBLIC AWARENESS

Recognising the vital importance of community understanding and awareness in achieving conservation of biological resources;

Acknowledging that Botanic Gardens of the world are visited by over 100 million people each year;

Aware of the increasing inadequacy of courses in many aspects of whole plant biology and systematics in schools and universities;

Accepting that Botanic Gardens are a unique resource for increasing the understanding of plants and plant conservation;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Calls on Governments, conservation organisations, schools and colleges, industry and concerned people to support educational programmes in Botanic Gardens by funding, moral support and direct involvement;

Urges Botanic Gardens to:

- develop education programmes for people of different ages, backgrounds and interests;
- engage people with professional training in education and botany to develop and implement programmes;
- promote conservation education both within gardens and in the broader community;
- engage in cooperative education programmes with conservation agencies, zoos, museums, societies and clubs;

Also calls upon Botanic Gardens and all media agencies, particularly television, to work together to generate a fuller understanding of how the plant kingdom is essential for the survival and well-being of all people on earth.
RECOMMENDATION 12
LIAISON AND TRAINING

Aware of the urgent need and desire of Botanic Gardens to develop long-term liaison through national, regional and twinning relationships leading to the North-South and South-South transfer of botanical science and technology;

Recognising the existence of training programmes offered by Botanic Gardens and their willingness to provide more opportunities for training;

The International Conference on Botanic Gardens and the World Conservation Strategy:

Recommend IUCN to validate formal agreements on long-term conservation action between two or more Botanic Gardens;

Recommend Botanic Gardens to provide suitable biological and horticultural training for staff responsible for critically threatened species;

Requests Botanic Gardens and other organisations to make known the existence of current training programmes and to encourage the provision of IUCN-validated conservation training.

RECOMMENDATION 13

The members of the International Conference on Botanic Gardens and the World Conservation Strategy:

Wish to Express their profound gratitude to the Excmo. Gobierno de Canarias and to the Excmo. Cabildo Insular de Gran Canaria for their invitation to hold their meeting in Las Palmas de Gran Canaria, famed throughout the world for the beauty and rarity of its extraordinary plant life;

Congratulates the Excmo. Cabildo Insular on its foresight and commitment in establishing and maintaining the Jardín Canario Viera y Clavijo which is widely admired as a model, and in implementing their campaign to "Make Gran Canaria Green Again";

Welcomes the Declaration of Gran Canaria, which will be seen as a major contribution to the world conservation movement;

Wishes to thank all the sponsoring and supporting institutions for their generous financial support and all the individuals, especially the Director and Staff of the Jardín Canario Viera y Clavijo, for their work in making this conference possible.
Appendix F

Constitution:
The International Association of Botanical Gardens
(IABG)
INTERNATIONAL ASSOCIATION OF BOTANICAL GARDENS

CONSTITUTION*

Section 1. Name and Affiliation

Article 1. The Association shall be called the International Association of Botanical Gardens (I.A.B.G.).

Article 2. The Association shall be affiliated to the International Union of Biological Societies (I.U.B.S.) as a Commission of the Botanical Group entitled the International Association of Botanical and Mycological Societies (I.A.B.M.S.).

Section 2. Objectives and Means

Article 3. The objectives of the Association shall be:

(a) To promote international cooperation between Botanic Gardens, Arboreta and other similar Institutes maintaining scientific collections of living plants and between the staffs of such Institutes.

(b) To promote the study of taxonomy of cultivated plants.

(c) To promote the study and the practice of appropriate introductions of appropriate plants.

(d) To promote the documentation and exchange of information, plants and specimens of mutual interest between Botanic Gardens, Arboreta and other similar Institutes.

(e) To promote and foster the conservation and preservation of rare and/or endangered plants through their cultivation and by other means within Botanic Gardens, Arboreta and similar Institutes.

(f) To promote cooperation between the I.A.B.G. and other appropriate bodies in obtaining habitat conservation.

Article 4. The objectives of the Association shall be pursued by the same methods and procedures as those provided in the I.U.B.S., either jointly or independently, but under the aegis of the Association. These methods and procedures shall include:

I. The publication of papers, books and indices;

II. the establishment of committees for special purposes;

III. the organization of meetings and symposia relating to the work of Botanic Gardens and Arboreta and any other activity consistent with the purpose of the Association;

IV. the promotion of the objectives of the Association and Botanic Gardens and Arboreta throughout the world.
Section 3. Membership

Article 5. All persons actively engaged or interested in the work of Botanic Gardens and Arboreta are eligible for personal membership of the Association.

Article 6. All Botanic Gardens, Arboreta and other Institutes actively engaged or interested in the objectives of the Association are eligible for institutional membership in the Association.

Article 7. Membership is acquired by application in writing to the Secretariat of the I.A.B.G. and payment of the appropriate annual fee to the Association.

Section 4. Council

Article 8. The affairs of the Association shall be controlled by a Council which shall consist of five officers: a President, a First and Second Vice-President, the immediate Past-President, and a Secretary; and, ten Councillors. Normally not more than two members of the Council shall be residents of the same country when elected. All members of the Council shall be personal members of the Association.

Article 9. The President, Vice- Presidents, Past-President and Secretary shall constitute the Executive Committee whose role will be to exercise a general control over the affairs of the Association and to carry out the duties that may be delegated to them by the Council.

Article 10. The Council shall be elected by a majority of the votes cast by members in a mail ballot conducted at least four months prior to a regular meeting of the Association at which an election of the Council has been designated as an agenda item. Such meetings must occur within three years following the previous meeting.

Article 11. The President and Vice-Presidents and Secretary shall hold office for one three-year term, but may be eligible for re-election for an additional three-year term. The Councillors shall hold office for a three-year term, but may be eligible for re-election for an additional three-year term. A Councillor may be elected as an officer after serving one or two regular three-year terms.

Article 12. Any vacancy occurring during the term of office of a Council member other than that of President, shall be filled by the Council. In the case of a vacancy in the presidency, the Past-President shall fill the remaining term of office. If the Past President is unable to serve, the First Vice-President shall act as President until the next regular meeting of the Association at which an election is conducted.

Article 13. The Council may at any time co-opt additional members for special purposes.

Section 5. Committees

Article 14. The Council shall have power to appoint committees to further the objectives of the Association and shall define the composition, duties and powers of such committees.
Section 6. Meetings and Elections

Article 15. The Association shall meet whenever possible at each International Botanical and Horticultural Congress. A business meeting may be held at such meetings. Other regular meetings may be arranged to permit the election of the Council and to conduct appropriate business. Notice of the business meetings shall be sent to members at least four months before the date of the meetings.

Article 16. Each personal member shall be entitled to one vote at a regular business meeting of the Association or on a mail ballot. An institutional member shall be entitled to one vote at a regular business meeting of the Association or on a mail ballot provided that a person representing that institution has been designated in writing to the Secretary of the Association.

Article 17. A quorum of a regular business meeting will be 30 members. A quorum of the Council shall be 5 members.

Article 18. At least seven months prior to a regular business meeting at which an election will be conducted, the President shall appoint a nominating committee of not less than three, but not more than five, members to nominate officers and councillors for the ensuing period. The report of this committee shall be filed with the Secretary at least five months prior to the business meeting and shall form the basis of the ballot for the election of the Council. Other nominations, endorsed by three members, may be sent to the Secretary and, where possible, shall be included on the ballot. All nominees must be personal members of the Association.

Article 19. The nominating committee when considering candidates for office, shall strive to make their nominations representative, and shall, as far as possible, take account of the diverse interests of Botanic Gardens, Arboreta and allied Institutes as well as the varied geographical areas of candidate residency. Whenever the nominating committee sees fit, it may propose more candidates than necessary for election, but not more than three times the number to be elected to the same position.

Section 7. By-Laws and Amendments

Article 20. The Council shall have the power to make by-laws for carrying into operation the terms of the Constitution.

Article 21. Amendments to the constitution may be proposed in writing by any member of the Association. Such amendments receiving the approval of a majority of the Council shall be submitted to the members for a mail ballot. Adoption shall require favourable vote of two-thirds of the votes cast. However, amendments rejected by the Council may be re-submitted by the mover for discussion at the next business meeting of the Association, and if a favourable decision is then obtained, they shall be voted upon by mail vote.

* proposed revisions are underlined. Articles 18 to 21 were previously 16 to 19. Articles 16 and 17 above are new. (December 1983)

B. D. Morley
Secretary I.A.B.G.
Appendix G

Pertinent International Organizations
Information, advice and assistance on the concept of international cooperation among botanic gardens, arboreta and similar institutions can be obtained by contacting the following organizations, many of whom have been indispensable to me in the context of this research:

American Association of Botanical Gardens and Arboreta (AABGA)
P.O. Box 206
Swarthmore, PA 19081
UNITED STATES OF AMERICA

American Association of Museums (AAM)
AAM/ICOM Program Coordinator
1055 Thomas Jefferson St., N.W.
Washington, DC 20007
UNITED STATES OF AMERICA

The Center for Plant Conservation
125 The Arbor Way
Jamaica Plain, MA 02130
UNITED STATES OF AMERICA

Herbarium News
P.O. Box 299
St. Louis, MO 63166
UNITED STATES OF AMERICA

International Association of Botanical Gardens (IABG)
c/o Dr. Brian D. Morley, Secretary General
Botanic Garden of Adelaide
North Terrace
Adelaide, SA 5000
AUSTRALIA
International Association of Botanical Gardens (IABG)
European-Mediterranean Division
c/o Dr. Hartmut Ern, Chairman
Berlin Botanische Garten
Koenigin-Luisè-Strasse 6-8
D1000 Berlin 33
FEDERAL REPUBLIC OF GERMANY

International Association for Plant Taxonomy (IAPT)
Department of Botany NHB #166
Smithsonian Institution
Washington, DC 20560
UNITED STATES OF AMERICA

International Board for Plant Genetic Resources (IBPGR)
Crop Genetic Resources Centre
Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Via delle Terme di Caracalla, 00100 Rome
ITALY

International Council of Museums (ICOM)
Maison de l'Unesco
1 rue Miollis
75732 Paris Cedex 15
FRANCE

International Union for the Conservation of Nature
and Natural Resources (IUCN)
c/o The Botanic Gardens Conservation Secretariat
53 The Green
Kew, Richmond, Surrey, TW9 3AA
ENGLAND
International Union for the Conservation of Nature and Natural Resources (IUCN)
c/o The Conservation Monitoring Center
Protected Areas Data Unit
219(c) Huntingdon Road
Royal Botanical Gardens
Cambridge CB3 0DL
ENGLAND

International Union for the Conservation of Nature and Natural Resources (IUCN)
Headquarters Office
Avenue du Mont-Blanc
CH-1196 Gland
SWITZERLAND

Natural Resources Defense Council
Plant Conservation Project
1350 New York Avenue, N.W., Suite 300
Washington, DC 20005
UNITED STATES OF AMERICA

Sister Cities International (SCI)
1625 I (Eye) Street, N.W.
Suite 424-426
Washington, D.C. 20006
UNITED STATES OF AMERICA

Trade Record Analysis of Flora & Fauna in Commerce (TRAFFIC - USA)
1255 23rd Street, N.W.
Washington, DC 20037
UNITED STATES OF AMERICA
UNESCO
Secretariat MAB (Man & the Biosphere)
7 Place de Fontenoy
75015 Paris
FRANCE

United Nations
Food and Agriculture Organization
Via delle Terme di Caracalla
I-00100 Rome
ITALY

United States Department of the Interior
Fish & Wildlife Service
Office of Scientific Authority - CITES
Room 527, Matomic Building
Washington, DC 20240
UNITED STATES OF AMERICA

United States Department of the Interior
National Park Service (773)
International Park Affairs
P.O. Box 37127
Washington, D.C. 20013-7127
UNITED STATES OF AMERICA

United States Department of the Interior
National Park Service (474)
Coordinator/Man & the Biosphere Program (MAB)
P.O. Box 37127
Washington, D.C. 20013-7127
UNITED STATES OF AMERICA

United States Agency for International Development
Washington, D.C. 20523
UNITED STATES OF AMERICA
United States Department of State
Office of Treaty Affairs
Washington, DC 20520
UNITED STATES OF AMERICA

World Wildlife Fund - United States
1601 Connecticut Avenue, N.W.
Washington, D.C. 20009
UNITED STATES OF AMERICA
Appendix H

The Desert Botanical Garden/CIDESON Agreement
A collaborative agreement entered into by, on the one hand, the Desert Botanical Garden, and on the other hand, Centro de Investigacion y Desarrollo de los Recursos Naturales de Sonora, hereafter referred to as CIDESON, in accordance with the following:

CLAUSES

I. The Desert Botanical Garden and CIDESON can collaborate on the level of developing long-term desert plant conservation and management programs, as well as on the level of designing and conducting specific projects on research and education/diffusion of results.

II. At the program level, Desert Botanical Garden and CIDESON can:
   A. Share the perspectives of an established and of an emerging arid lands research institution;
   B. Develop and conduct cooperative international programs on desert plant research, conservation and education;
   C. Establish linkages between U.S. and Mexican research and education institutions;
   D. Strengthen ties between Mexico and the U.S. at the working scientist level.

III. At the project level, Desert Botanical Garden and CIDESON can:
   A. Collaborate in conducting specific desert plant research and conservation projects, agreed to by both parties;
   B. Exchange bibliographic information, plant materials and voucher specimens required for research, education and conservation projects;
   C. Collaborate on field expeditions or training visitations by the employees of one institution to the other;
   D. Encourage effective communications to increase scientific cooperation.
IV. The content areas of exchange and collaboration between the two institutions may include, but are not restricted to, the following:

A. Native plant resource conservation in desert regions, both in habitat and under cultivation;

B. Economic potential of native plants of Northern Mexico and of the Southwestern USA;

C. Collection of native plant materials in accordance with the laws and permits of both countries;

D. Demonstration projects on native plant conservation and development;

E. Development and dissemination of educational materials on deserts and their indigenous resources;

F. Applications of new scientific techniques and plant management technologies;

G. Sponsoring training workshops, symposia, conferences and congresses on arid lands topics.

V. For all areas of collaborative research which involve working groups composed of personnel from both institutions, joint proposals for funding will be sought unless otherwise agreed upon by both parties.

VI. Each of the parties will name a coordinator to maintain communication between the two institutions, and occasional visits from one to the other should be planned.

VII. Both parties agree to exchange published information and data in computerized information banks, and to encourage the flow of such information.

VIII. Both parties will assist one another in providing letters of recommendation, in obtaining research and collection permits, and other background information required by one or both governments to allow such collaborative research.

IX. Before beginning any collaborative project on outside funds, both institutions will jointly prepare estimates of expenses for equipment, materials, salaries and benefits, according to the work to be done. Both parties agree to prompt accounting and/or payment for expenditures involved in each portion of collaborative work.

X. The parties agree that this agreement cannot be transferred by either party to anyone else without prior notification to the other party to obtain its written consent.
Appendix I

Guidelines for a Standard Agreement Document
Following is information concerning the contents of "standard agreements", concerning technical assistance, as developed by van Wouw (1971).

(a) a preamble in which the parties state that in a spirit of friendly co-operation they have entered into the agreement to give effect to the resolutions and decisions relating to technical assistance of the organizations, which are intended to promote the economic and social progress and development of peoples;

(b) there follow Articles dealing with:

(i) the furnishing of technical assistance; under this head the organizations, acting jointly or separately, and the government undertake to co-operate in arranging, on the basis of the requests received from the government and approved by the organizations concerned, mutually agreeable programmes of operations for the carrying out of technical assistance activities. Such technical assistance shall be furnished and received in accordance with the relevant resolutions and decision of the assemblies, conferences and other organs of the organizations and may consist of making available the services of experts, organizing and conducting seminars etc., awarding scholarships etc., preparing and executing pilot projects etc., and any other form of technical assistance which may be agreed upon;

(ii) the co-operation of the government concerning technical assistance;

(iii) the administrative and financial obligations of the participating organizations;

(iv) the administration and financial obligations of the recipient government;
(v) privileges and immunities. All the agreements contain a provision to the effect that the requesting government shall apply to the organizations and their agents the Convention on the Privileges and Immunities of the United Nations where it concerns the UN, the Convention on the Privileges and Immunities of the Specialized Agencies in respect to the agencies, and the Agreement on the Privileges and Immunities of the IAEA where IAEA is concerned;

(c) a number of general clauses which comprise entry into force, modification, termination, settlement of disputes, and related questions.
Appendix J

The Wisconsin/Heilongjiang Agreement
Proposal For Seed Exchange

Whereas the climate and vegetation of Heilongjiang Province and Wisconsin are complementary, a diverse range of native and horticultural plants from each area would be pre-adapted to growing conditions in its counterpart.

Therefore, a program of woody plant seed exchange between Heilongjiang Province and Wisconsin would mutually benefit horticulturists, botanists, foresters, and our general citizenry by increasing and diversifying the taxa of plants that each region might grow, as well as fostering friendship between our nations.

In order to establish a program of exchange and communication, the following guidelines are suggested:

1) Commencing in 1987, annual Indices Semina will be exchanged.

2) Seed collected from natural populations, arboreta, and cultivated specimens will be eligible for exchange.

3) When possible, specific requests for particular taxa will be considered and met.

4) All exchanged seed will be identified according to the International Code For botanical nomenclature, source (e.g., native population, arboretum, cultivated specimen, etc.), and site data (e.g., latitude, longitude, altitude, average minimum winter temperature, etc.)

5) When requested, additional information (e.g., cultural requirements, ecological data, etc.) will be provided, as available.

6) When possible, efforts will be made to facilitate the expansion of the exchange program to include taxa from outside our respective regions, and to act as intermediaries in communicating with other arboreta, botanical gardens, and researchers.