

# CASE TEACHING NOTES

for

## “Marketing Mostly Intangible Goods: The Case of Botanical Gardens and Arboreta”

by

**Jorge A. Santiago-Blay**

Department of Paleobiology

National Museum of Natural History, Smithsonian Institution

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### INTRODUCTION / BACKGROUND

This case study illustrates some of the common social and economic problems facing botanical gardens and arboreta today. The case describes a conversation between Angie and Suzie, two long-time staff members at an unnamed botanical garden/arboretum. The women are discussing the economic difficulties the garden is experiencing. Like so many others, this botanical garden has been losing funds. Students read the case dialogue and then in small groups discuss the value of botanical gardens and arboreta as well as their mission and operation, asking themselves “Should this botanical garden/arboretum be supported? Why or why not? If it should be supported, how should funding for it be sought?” Students discuss the issues and then prepare an oral presentation as well as a written outline of a grant proposal seeking economic support for a botanical garden or arboretum of their choosing. To help instructors (and students) with the latter, see the attached document entitled “[Some Principles of Marketing: A Simplified Approach](#)” (in MS Word format, 44KB), which outlines and describes six steps for developing an effective marketing strategy.

This case study can be adapted to accommodate students with diverse background knowledge in biology, ranging from juniors and seniors taking environmental science or conservation biology courses, to freshmen or sophomores (science or non-science majors) enrolled in introductory biology courses, particularly those that include units on botany, biodiversity, and/or ecology. If the latter, instructors will need to provide additional scaffolding on what botanical gardens and arboreta are and the services they provide as well as on developing grant proposals. While the case was written to focus on botanical gardens and arboreta, instructors and/or students should feel free to look at other not-for-profit agencies that may better suit their interests and/or needs.

The case assumes basic knowledge of botany, ecology, or conservation biology, which students should have obtained through lectures and handouts given to them ahead of time to allow for adequate student preparation. Links to documents pertaining to botanical gardens and arboreta are included in the References below.

### *Objectives (and Assessments)*

At the end of this activity, students will be able to:

- Discuss the values of botanical gardens and arboreta and apply this information in a group presentation.
- Discuss the mission as well as operational features of botanical gardens and arboreta and apply this knowledge in a group presentation.

In successfully completing the above objectives, students should be able to use examples as they solve the problem of advocating for their gardens or arboreta with minimal directions from the instructor.

This will be assessed by the instructor as s/he makes him/herself available to answer questions and via the group oral presentations. A rubric for assessing the oral presentations (in MS Word format, 45KB) is used; others are available on the web, e.g., see <http://library.ole.edu/orlpresbrks.htm> and <http://www.haverford.k12.pa.us/hms/Integrating/rubric.html>.

- Develop skills in proposal writing and presentation.

Specifically, students should be able to demonstrate that they can write and present a proposal advocating for their botanical gardens or arboreta and promoting known values of their unit with minimal directions from the instructor. This will be assessed by the instructor as s/he makes him/herself available to answer questions and via the group oral presentations and written proposal outlines. A rubric for assessing the proposal outlines (in MS Word format, 44KB) is used; others are available on the web, e.g., see <http://www.sci.sdsu.edu/BFS/first/rubricgrant.html>.

- Appraise the effectiveness of the oral presentations of their fellow students.

In addition to instructor assessment of the oral presentations, students also are expected to assess their fellow students' oral presentations using two instruments: the rubric for the oral presentations and by the amount of support (in fake checks—see [bottom of the rubric for the oral presentation](#)) each presenting group receives.

### **Educational Value of this Case Study**

This case and its related activities provide a link between concepts in botany, conservation biology, ecology, and other scientific fields of study and the practical, real-world issues related to the management of botanical gardens and arboreta including social and economic factors. Depending on a garden's mission, the management of it may encompass how to take care of the living collections, the artistic design of the collections and associated landscapes and natural areas, educational/interpretive programs, research, financial management, staffing, etc. As one colleague eloquently indicated, "In summary, this case presents many opportunities for use in a wide range of courses. Its brevity and simplicity of use are advantages that make the case appealing to faculty. The science content is important, yet the case introduces students to key social and economic factors that relate to many issues in conservation. Faculty could easily expand the discussion to include the social value of zoos, natural areas, wildlife parks, greenways, etc., and to include discussion on how we as a society often place higher value on protecting animals than on plants, especially when this value translates into expenditure of funds." Moreover, this case and its references could, as one of the anonymous reviewers pointed out, form the basis of a service-learning project for students (e.g., working with community garden projects in a city). A similar approach to teaching and learning, through the use of "complex, capacious, and unsolved public issues," is used by SENCER (<http://www.sencer.net>).

### **CLASSROOM MANAGEMENT**

This case study is recommended for use in classes of 20 to 25 students.

### **Advance Preparation**

To prepare for the case, instructors and students should read the paper by Rinker (2002) entitled "The Weight of a Petal: The Value of Botanical Gardens" available at <http://www.actionbioscience.org/biodiversity/rinker2.html>. Another good article to center the case on is "Gardens in Full Bloom" by Emma Marris, which appeared in the April 13, 2006, issue of *Nature* magazine. Other background readings and resources are listed in the References. Instructors may wish to distribute some of these additional materials to students ahead of time as well.

Ideally, instructors should become familiar with several *local* botanical gardens or arboreta so that they may consider using one or more of them to implement this case. In this way, instructors will develop a more intimate knowledge of botanical gardens and the intricacies of their budget and operation—information that is often not readily available on the web. The types of information instructors (and students) will want to collect about a particular garden include, for instance, its mission and vision; size; hours of operation; location (climate, slope, urban or rural, etc.); history and traditions; plant holdings (e.g., numbers, specialties and their requirements); budget (income and costs; trends, prospects); staff members (numbers, responsibilities, paid/non-paid; labor problems, if any); visitors (numbers, trends, gender, purpose); marketing (website, ads); certification (see, for example, the Tennessee Arboretum Certification Program at <http://www.state.tn.us/agriculture/forestry/arboreta/application.pdf>), etc. Students may consider visiting the gardens themselves and speaking with their staff members.

### ***Student Groups and Activities***

Students are divided into groups of four or five. Each group represents a garden or an arboretum to be studied. References to meta-sites listing arboreta and botanical gardens can be found in the References section, below. There must be something specific about a botanical garden or arboretum that captures the interest of the students and that would tie it in neatly with the course (e.g., how can the displays of the garden, say the tropical plant collection, be made more attractive and have added educational value?). The botanical gardens or arboreta may have special botanical significance (e.g., be strong in a particular group of plants, harbor an unusually high floristic biodiversity, be strong in particular biogeographic regions, emphasize plant adaptations, showcase uses that humankind has given to plants, etc.). As mentioned above, if the chosen botanical garden or arboretum is local, students may be able to pay a visit and gather additional information not available on the web through face-to-face interviews and “ground-truthing” of the botanical garden or arboretum.

In their small groups, students should discuss the mission as well as operational issues of their garden or arboretum. Then, in each group, each student selects a role to play from one of the following stakeholders (or interest groups), which very likely has different perspectives on the needs (and/or that of his/her constituency) and the ways that botanical gardens and arboreta may help fulfill those needs:

- Education/outreach person at the garden or arboretum.
- Person from the community.
- Garden director.
- Research partner (e.g., a local college, the private sector, the government, private citizens, etc.).
- Representative of the parent organization/funding agency that gives funds to the garden or arboretum (e.g., the people responsible for cutting funds to gardens, as in the case of Angie’s and Suzie’s garden).

At first, similar stakeholders (or experts) from different groups meet and brainstorm. Then, each student returns to his/her garden or arboretum group and the group then prepares an oral presentation as well as a proposal outline. The oral presentations are presented and evaluated. A final debriefing that summarizes the main points of the case concludes the activity. The written proposal outlines are turned in at the end of the activity or the next time class meets.

The students’ work is guided by the questions listed at the end of the case:

1. Discuss why botanical gardens and arboreta are (or are not) worth keeping.
2. Explain at least five aspects of the mission and operation of botanical gardens and arboreta.

3. Assuming that one believes that botanical gardens and arboreta are worth keeping, form groups of four to five, choose a botanical garden or an arboretum, and prepare an oral presentation as well as a written proposal outline explaining how you would alleviate the economic problems that many botanical gardens and arboreta are experiencing.

The production of a short group oral presentation and a short group proposal outline are the most important activities of this case. To further guide the discussion, I suggest the following questions for each expert/stakeholder and garden or arboretum group:

1. What are the needs of the group I represent?
2. How can this botanical garden or arboretum help fulfill those needs?
3. If the solutions developed to help alleviate the problems require money, how can we fund them?

### **Format, Timing, and Resources Needed**

#### **Format**

This case uses a mixed format that includes a mini-lecture and an interrupted discussion. I have provided two alternate teaching options for the case—one that requires 50 minutes (a single class period) to complete and does not include the oral presentations or proposal writing activity, and one that requires two hours, or 120 minutes, to complete (one 2-hour lab period, for example). Both options are described below under Activities in Detail. The longer option culminates in the short oral group presentations by the students. In addition, each group is expected to turn in a grant proposal outline, and the wrap-up session includes awarding (fake) checks as well as debriefing the case by summarizing the main points of the activity.

When pursuing the longer format, use either of the two options described below for the oral presentations:

- Option 1. Each group of students is responsible for presenting a proposal on a *different* garden
- Option 2. Each group of students is responsible for presenting a proposal on the *same* garden.

Option 1 enables students to evaluate different (perhaps dissimilar) gardens. Option 2 enables students to compare different plans for the same institution and glean the best ideas from different proposals to make an improved whole. Also, option 2 allows the instructor to compare directly the depth of presentation of each group by controlling for the garden. Depending on the instructor's goals, one or the other option may be preferred.

#### **Resources Needed**

If you are having the students prepare and present oral presentations as well as produce an outline of a grant proposal, the following materials are recommended:

- Easels with paper and markers in several colors for possible poster presentations.
- An overhead projector, transparencies and transparency markers in several colors for possible presentations using overheads.
- If computers/laptops and printers are available, students can be expected to produce their oral presentations using PowerPoint as well as a proposal outline that can be turned in the same day. If computers are not available, the proposal outline may be turned in as a handwritten version the same day, or preferably, as a typed version that incorporates the feedback from the audience at a later time.

#### **Activities in Detail**

This section describes each portion of the implementation of the case, with specific activities and allotted times noted.

## 50-minute class period

1. *Ice-breaker*: Begin class by having students read silently (or out loud) the dialogue between Angie and Suzie.

Having them read the dialogue out loud and act it out gets the students all to the same point at the same time in terms of readiness to respond to the scenario. Particularly for a case targeting students with minimal background, a more active approach could reap benefits in getting them to discuss what is going on.

*Allotted time*: 2–5 minutes

2. Follow with a mini-lecture entitled: “What are botanical gardens and arboreta?” Use Rinker (2002) as a guide. When finished, ask students:
  - a. “How many botanical gardens and arboreta are there in [name of your town, city, or state (depending on your specific circumstance)]?” Wait for students to answer, then give the answer and show a few images of those gardens.

There are many resources you can consult for the location of botanical gardens, e.g., <http://www.botanique.com/tours/usamap.htm>, <http://www.gardenvisit.com/m/ekey.htm>, and Spencer and Russell (2005). Additionally, the National Home Gardening Club publishes an annual Directory of Public Gardens and also has a Public Garden Locator on its web site at [http://www.garden.org/public\\_gardens/](http://www.garden.org/public_gardens/). Instructors may consider using a map and push-pins to locate the gardens in the area being considered.
  - b. “Why do you think botanical gardens and arboreta are important?” Wait for answers, and then introduce next activity.

*Allotted time*: 10 minutes

3. Divide the students into their small garden groups, each made up of four or five students (depending on the size of the class). Ask students to come up with at least five reasons why botanical gardens are important. At a minimum, students should have access to copies of Rinker (2002) to answer this question. On the other hand, it may be instructive to have groups develop an uninformed list (“misconceptions”) and then discuss which listed items appear frequently on institutions’ statements of philosophical and operational goals versus those that do not appear. Revealing misconceptions may better inform groups’ proposals in that they will be able to anticipate and address popular fallacies and provide stronger arguments in favor of their particular proposals.

What if students consider that gardens have no significant values? Ultimately, it is a matter of values, but students can be asked to assume that they consider them to have value and to answer the questions and engage in the activities based on that assumption.

*Allotted time*: 15 minutes (10 minutes to discuss as groups and 1 minute per group to present—choose only a few groups if total class size exceeds 25). Instructor serves as the scribe and writes one master list of key words for the entire class on easel, board, or overhead projector.

4. Ask the student groups to discuss at least five aspects of the mission and operational features of botanical gardens and arboreta. At a minimum, students should have access to copies of Rinker (2002) to answer this question and websites of the botanical gardens and arboreta that the instructor and/or each group select.

*Allotted time:* 15 minutes (10 minutes to discuss as groups and write a list; 1 minute per group to present—choose only a few groups if total class size exceeds 25). The instructor serves as the scribe and writes one master list of key words for the entire class on easel, board, or overhead projector.

### **One full laboratory period of two hours**

In a longer class period of 120 minutes, the students and instructor would complete tasks 1–4 above, which take approximately 45–50 minutes, then proceed with tasks 5–7, below, which require an additional 65–70 minutes to complete, for a total of 110 to 120 minutes for the longer version.

5. Working in their groups students prepares their oral presentations and also draft a proposal outline reflecting what they have learned from stakeholders' group meetings.

*Allotted time:* 30 minutes

Each student group then presents their ideas for their garden or arboretum to the entire class.

*Allotted time:* 25 minutes (5 minutes per group)

6. Students appraise the effectiveness of the oral presentations using a rubric. In addition, at the bottom of the rubric is a fake blank check. Students are instructed that each check they write may not exceed a total of US \$100,000 and that they may choose to give money to any number of gardens or arboreta but not to their own group. Checks are awarded for an amount directly proportional to the points each student gives to each group on his/her evaluation using the rubrics (e.g., 70 points corresponds to a check for 70,000). This wrap-up activity makes each student a potential donor. What if students agree with the values of gardens and yet choose not to fund them? Although I think this would be sad, this is a reality in human endeavor: worthy causes often do not get funded.

*Allotted time:* 10 minutes (5 minutes for students to complete evaluations and write checks and pass them to the instructor, 5 minutes for the instructor to tally amounts awarded to each group and distribute checks to the corresponding groups).

7. A final debriefing by the instructor with active participation from the students summarizes the main points and concludes this case.

*Allotted time:* 5 minutes

### **About the Author**

I visit gardens and arboreta to get materials for my research on generating a chemical library of modern and ancient plant resins (amber) (<http://www.geocities.com/santiagoblay/events.htm>). This has helped me garner the knowledge that allows me to teach this case. From conversations with many staff members at those gardens, I have learned about the difficult economic situations many of them are in. My web page has links to some of the many botanical gardens and arboreta that I have visited. For a personal perspective on the spiritual value of gardens, see attached document entitled “**Spiritual Values of Gardens: Our Personal Perspective**” (in MS Word format, 41 KB).



## REFERENCES (ORGANIZED THEMATICALLY AND ANNOTATED)

### *Lesson Planning*

Lesson Planning: The Steps to Promote Student Learning and to Help Your Students Reach the Course Objectives, Montgomery College, Center for Teaching and Learning.

<http://www.montgomerycollege.edu/ctl/Shaffer/LessonPlanning/LessonPlanningFrameset-2.htm>

A detailed discussion of lesson planning and the construction of educational goals, including objectives, activities, and behavioral outputs. Last Accessed: 05/04/2006.

SENCER: Science Education for New Civic Engagements and Responsibilities

<http://www.sencer.net>

Last Accessed: 05/04/2006.

### *Gardens of the World (with an Emphasis on those located in North America)*

American Association of Botanical Gardens and Arboreta, Public Gardens Search

[http://www.aabga.org/public\\_html/mem/mgSearch.cfm](http://www.aabga.org/public_html/mem/mgSearch.cfm)

Useful site for information on botanical gardens and arboreta in the United States.

Last Accessed: 05/04/2006.

American Association of Botanical Gardens and Arboreta, Resources

[http://www.aabga.org/public\\_html/resrcs/index.cfm](http://www.aabga.org/public_html/resrcs/index.cfm)

Contains a list of items with information useful in preparing a discussion of the mission and operational aspects of botanical gardens/arboreta as well in preparing the proposal outline. Last

Accessed: 05/04/2006.

Arboretum and Botanical Gardens of the World

<http://www.crescentbloom.com/II/E/05.htm>

This link not only has botanical gardens and arboreta of the world but it also has the Compleat Botanica, an on-line (not free) data bank. This particular site could be used as the impetus for an exploration of how different countries' botanical resources are valued, a variation on the case herein presented. It would be suitable for a course in environmental public policy. Last Accessed: 05/04/2006.

Botanical Gardens / Arboreta

<http://nature.ac.uk/browse/580.73.html>

This site has lists of botanical gardens and arboreta as well as organizations interested in them throughout the world. Last Accessed: 05/04/2006.

BOTANIQUE: Map of United States of America

<http://www.botanique.com/tours/usamap.htm>

A clickable map of the United States that allows users to see the location of selected gardens in the U.S.

Last Accessed: 05/04/2006.

Garden Finder Lists & Key Map

<http://www.gardenvisit.com/m/ekey.htm>

A clickable partial map and listing of gardens in Europe and North America that allows users to see the location of selected gardens. Last Accessed: 05/04/2006.

I Love Gardens

<http://www.ilovegardens.com/>

This site has links to many botanical gardens and arboreta in the United States (and it seems to be more

complete in their listings of U.S. botanical gardens and arboreta than other similar sites). Last Accessed: 05/04/2006.

Spencer, T. S. and J. J. Russell. 2005. Gardens across America. *The American Horticultural Society's Guide to American Public Gardens and Arboreta*. Volume 1: East of the Mississippi. Taylor Trade Pub. Lanham, Maryland, U.S.A. 460 pp.

### ***Overview of Botanical Gardens, Their Missions, and Values***

American Association of Botanical Gardens and Arboreta, Public Gardens Search

[http://www.aabga.org/public\\_html/mem/mgSearch.cfm](http://www.aabga.org/public_html/mem/mgSearch.cfm)

Useful site for information on botanical gardens and arboreta in the United States.

Last Accessed: 05/04/2006.

American Association of Botanical Gardens and Arboreta, Resources

[http://www.aabga.org/public\\_html/resrcs/index.cfm](http://www.aabga.org/public_html/resrcs/index.cfm)

Contains a list of items with information useful in preparing a discussion of the mission and operational aspects of botanical gardens/arboreta as well in preparing the proposal outline. Last

Accessed: 05/04/2006.

Arboretum and Botanical Gardens of the World

<http://www.crescentbloom.com/II/E/05.htm>

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Botanic Gardens Conservation International

<http://www.bgci.org/>

This is the premier site for botanical gardens and arboreta worldwide and their conservation and education missions. Four of its sub-sites (Botanic Gardens, Plant Conservation, Discovering Plants, and Education) are filled with ideas and activities of educational value. Last Accessed: 05/04/2006.

Canadian Botanical Conservation Network

[http://www.rbg.ca/cbcn/en/publications/workshops/p4p/p4p\\_work07a.html](http://www.rbg.ca/cbcn/en/publications/workshops/p4p/p4p_work07a.html)

Last Accessed: 05/04/2006.

Galbraith, D. A. 1999. Toward a Canadian Botanical Garden Biodiversity Action Plan: A discussion paper for Environment Canada and The Canadian Botanical Conservation Network. Canadian Botanical Conservation Network.

[http://www.rbg.ca/cbcn/en/publications/misc/ec\\_discdoc.html](http://www.rbg.ca/cbcn/en/publications/misc/ec_discdoc.html)

Last Accessed: 05/04/2006.

Galbraith, D. A. No date, possibly 1998. The Convention on Biological Diversity: Articles Pertinent to Botanic Gardens. Proceedings of the 1998 International Botanical Gardens Conservation Congress. Botanic Gardens Conservation International, London, United Kingdom.

<http://sciwebserver.science.mcmaster.ca/Biology/faculty/galbraith/papers/bgcicong.htm>

Last Accessed: 05/04/2006.



Garcia-Dominguez, E. and K. Kennedy. 2003. Benefits of Working with Natural Areas. *Public Garden* [AABGA (American Association of Botanical Garden and Arboreta), Wilmington, Delaware, U.S.A.] 18(3): 8–9, 44.

The American Association of Botanical Gardens and Arboreta Conservation Committee surveyed member gardens with regard to “natural areas” in an effort to document their contribution to habitat stewardship as part of the Global Strategy for Plant Conservation. Some important data on botanical gardens and arboreta follow. There are nearly 400 botanical gardens and arboreta in the U.S. and nearly 100 in Canada. The area of the botanical gardens and arboreta ranges widely, from as large as parts of national parks to small plots. Based on 92 institutions in the U.S. and Canada, the average area of botanical gardens and arboreta is approximately 700 acres (= 350 hectares; 1 hectare = 100 m × 100 m or 100 m<sup>2</sup>). The total area in the U.S. and Canada is approximately 20 × 10<sup>6</sup> km<sup>2</sup>. Based on these estimates, the botanical gardens in the U.S. and Canada occupy a grand total of 350,000 acres (175,000 hectares), less than 0.01% of the combined land area of the U.S. and Canada. Last Accessed: 05/04/2006.

#### I Love Gardens

<http://www.ilovegardens.com/>

This site has links to many botanical gardens and arboreta in the United States (and it seems to be more complete in their listings of U.S. botanical gardens and arboreta than other similar sites). Last Accessed: 05/04/2006.

Marris, E. 2006. Gardens in Full Bloom. *Nature* 440(7086): 860–863.

Article on the importance of botanical gardens, both as “storehouses of rare plants and skills” and “increasingly as centres of molecular research.”

McIvor, L. 2004. A changing role for botanical gardens. *Pappus* (Winter/Spring): 27–28.

[http://www.bgci.org/files/7/789/RoleBG\\_PAPPUS.pdf](http://www.bgci.org/files/7/789/RoleBG_PAPPUS.pdf)

Last Accessed: 05/04/2006.

#### Millennium Seed Bank Project

<http://www.kew.org/msbp/>

Another example of botanical gardens as the last repository of species at the verge of extinction.

Last Accessed: 05/04/2006.

Rinker, H. B. 2002. The Weight of a Petal: The Value of Botanical Gardens

<http://www.actionbioscience.org/biodiversity/rinker2.html>

Note: This paper is copyrighted © 2002, American Institute of Biological Sciences, but educators have permission to reprint it for classroom use. Additional links are provided at the end of the article.

Last Accessed: 05/04/2006.

### ***Operational Aspects of Botanical Gardens and Arboreta***

Certification for Botanical Gardens and Arboreta in Tennessee

<http://www.state.tn.us/agriculture/forestry/arboreta/application.pdf>

Last Accessed: 05/04/2006.

### ***Economic Aspects of the Operation of Botanical Gardens***

A Profile of Environmental Nonprofit & Voluntary Organizations in Canada

<http://www.cegn.org/NSNVO%20Environment%20Highlights.pdf>

Last Accessed: 05/04/2006.

Hohn, T. C. no date. Curatorial Practices for Botanical Gardens

<http://hort.edcc.edu/Curatorial%20Practices.pdf>

For many more examples, including research, community involvement, medicinal and economic plants, ecotourism, designing gardens in different climatic regions, student research, information management, plants, sustainable designs, problem of invasive species, etc. Last Accessed: 05/04/2006.

National Tropical Botanical Gardens, Port Moresby, Papua New Guinea

<http://www.ncbg.org.pg/>

Last Accessed: 05/04/2006.

### *Rubrics*

A rubric for oral presentations

<http://library.olc.edu/orlpresrbrks.htm>

Last Accessed: 05/04/2006.

A rubric for oral presentations

<http://www.haverford.k12.pa.us/hms/Integrating/rubric.html>

Last Accessed: 05/04/2006.

A rubric for written grant proposals

<http://www.sci.sdsu.edu/BFS/first/rubricgrant.html>

Last Accessed: 05/04/2006.

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