

THE PUBLIC GARDEN

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Labeling and Interpretation

- How to design and integrate labels
- How to plan an interpretation program
- How to greet the young visitor



Heritage Garden

The Heritage Garden is designed as the most scientific botanic garden in Padua. The Heritage Garden is divided into two quadrants, separated by patterned paths. The first quadrant displays a portion of the world's plant families; these groups are arranged in order based on the increasing complexity of their reproductive structures. Another quadrant displays plants according to their geographic origin. Located in the last quadrant is the Garden of Carolus Linnaeus.

We invite you to enjoy the heritage gardens and to discover the complexity of today's world.



Plus

- A survey of horticultural therapy programs
- An interview with John Simmons



by Randi Korn

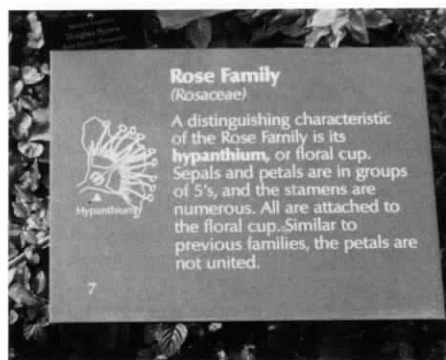
The interpretive label, if prepared properly, is one of the most effective communication tools for bridging the gap between the casual visitor and displayed plant collections. The label may direct the viewer where to look, convey and clarify complex horticultural and botanical information, ask thought-provoking questions or encourage the visitor to compare the similarities and differences between plant specimens.

In 1885, G. Browne Goode, Assistant Secretary of the Smithsonian Institution said, "An efficient educational museum may be described as a collection of instructive labels, each illustrated by a well-selected specimen A label may contain a vast amount of exact information, and yet by reason of faulty literary and typographic arrangement, have as little significance and value as a blank piece of paper." This statement, spoken almost a century ago, was quite accurate. Since then educators and psychologists have examined the problems inherent in label design and information comprehension in informal learning environments such as museums. Their findings provide guidelines for preparing effective, interpretive museum labels that are applicable to botanical gardens and arboreta. The goal of this article is to assist the interpreter in designing aesthetic, legible and readable labels that visitors will want to read.

Typography

Before discussing the factors that contribute to readable and legible labels, it is necessary to introduce the principles of typography. Typography is the arrangement, style and appearance of matter

printed from type. The appearance of a label is partially determined by the selected letter style or typeface. There are over 5,000 typefaces which are classified into four categories (see Figure 1): serif type has short cross lines at the ends of the letters creating a classical, warm look; sans serif type does not have cross lines and the line weight of the letters is uniform, giving a clean, modern look; transitional type is in between serif and sans serif, slightly more classical than sans serif; and decorative type is designed to express a particular mood or to attract attention. A font is the complete assortment of type, including punctuation, symbols and numbers in any given typeface. A typeface may also be available in italics and bold, regular and light letter weights.



Sub-garden sign (9" x 12") interpreting information on a specific portion of the sub-garden. Diagrams often help explain botanical ideas that are difficult to observe with an untrained eye.

The standard units of measure used by typesetters and typographers are points and picas. Type size and line spacing are measured in points, and line length is measured in picas. Typefaces are available in sizes ranging from four

to 144 points. Though inches should never be used when indicating type measurement, there is some relationship to the English measurement system: 72 points = 1 inch (the capital letter height of a 72 point letter is 1 inch); 12 points = 1 pica; and 6 picas = 1 inch. A pica ruler, which also measures points, is available in any art store.

Readability

An effective label has copy that is readable. Readability reflects the reading difficulty of the text. The reading level for the average adult is between the sixth and eighth grade levels. Although this is not very high, it is important to realize the reading level of the materials that visitors read in their daily life is probably lower than the level of school they completed. Labels that contain interesting information written in a simple language do not talk down to visitors but rather allow visitors to process more information with less stress.

Before labels go into final production, they should be tested for clarity and their ability to communicate information. There are several formulas available that test the reading grade level of material. An easy formula is the SMOG Readability Formula. Since it requires using 30 sentences, it is a good idea to choose several labels randomly and combine them into one sample. To approximate the grade level of a text, the formula is to add three to the square root of the number of polysyllabic words in 30 sentences. A polysyllabic word has three or more syllables. Estimate the square root of the number of polysyllabic words by taking the square root of the nearest perfect square. For example, if you count

Q You mentioned that many of your staff are involved in special projects. What kind of projects are they, and what is the motivation behind them?

A We are involved with a number of exciting tasks. At this moment I have an assistant curator in South India helping to set up a new tropical botanic garden. We have a project in the Cameroons in West Africa where we are going to help create what could be called the botanic garden of the future. This is a garden totally involved with conservation and sustainable agriculture. It is to be an educational center with a collection of crops which are of value in tropical forests.

We have been involved in field collection in northeast Brazil, an Anglo-Brazilian project that has built up a massive herbarium as well as a living collection of plants with duplicates being distributed worldwide, giving Kew the benefit of cross-reference material.

Quite often we are approached by foreign governments who want us to advise them on a particular project. We are seen rather differently than we were in the past. Our colonial history opened up channels for us, but I think Kew today is seen as being more widely useful to people. In colonial days we had to provide information, like an imperial extension service, but now we are seen almost as an independent, international organization which can advise without political overtones.

Q There is a great deal of activity at Kew at the moment—a new conservatory and museum being built, the Palm House being restored. To what do you attribute this current flurry of capital projects?

A First, I believe botanic gardens have to be continually appropriate to their time. It is perfectly viable to have an historic garden, but if you have a working, living garden, it cannot stay still.

Second, what you are seeing now is the fruition of ideas first devised in the early 1970s. That period was a fertile

time for us; we were able to project forward those things we wished to achieve and to translate them into actual programs. Over the next two years the Princess of Wales Conservatory, the Palm House, the Museum and a new marine algae display (seaweeds) will be open to the public.

The multi-environment conservatory is being built because we needed to display certain collections, but we also felt that it should reflect our responsibilities for environmental education. We ought to be telling people about different plant environments. Botanic gardens are the shop window for the plant world, and if we aren't telling people of their importance to mankind and the destruction they now face, no one else will do so.

What it boils down to is that we have confidence in our abilities. We know we can achieve success in almost any horticultural endeavor. None of these projects seems very difficult now, and once you have completed a successful project, it is easier to go on with others. The architect who was working on the new museum wasn't worried about the technical problems because he had already worked with us on a previous project and knew that the advice we were giving him was sound.

Q Now that you have achieved a certain number of specific goals, what do you have in mind for the future?

A We are working on a corporate plan. They are necessary, if dangerous, documents because in Britain corporate plans are the means by which others make budget cuts! More seriously, we see environmental issues coming to a head. The whole business of degradation of ecosystems worldwide has enormous implication, especially for us in the West. We are also conscious of horticulture's potential help to the increasing numbers of unemployed and those working in stressful jobs. We should never forget that to most people gardens are a sanctuary, somewhere they can come to relax and gain empathy with

plants. Botanic gardens should be addressing these issues because horticulture has answers for them all.

Q You have visited the eastern side of the United States quite often. What is your opinion of the state of American horticulture so far?

A I have only seen a small part of this country so I am reluctant to make sweeping judgments, but from what I have seen, there is an inordinate enthusiasm for horticulture here. It is thriving, and it's going forward.

What interests me personally is the selection and development of native plants. When you look at the vast range of native American plants and start selecting good garden forms, you realize it is all to be done. Here are superb plants not just suitable for the U.S.; they would be greatly admired in Europe, too—as many are already.

In public gardens, roles seem to divide in ways unlike those in Britain. People involved in public horticulture here seem oriented towards business management, finance, hiring and firing, etc. Plantsmanship tends to be confined to the amateur, the enthusiast.

Q Have you been tempted by opportunities outside Kew?

A At this stage in my life I am not particularly tempted by anything other than greater independence. I have had almost 30 years of management and other people's problems, and it doesn't get any easier.

I am involved in a new professional organization, the Institute of Horticulture, as its President-Elect. This was started in part as a response to the economic threats to horticulture in Britain. And even though I think of recession as a test of a good manager, we do need to come together to find ways of helping our industry rise out of decline.

On a more personal level, my wife and I have found a new home in Norfolk on the eastern side of Britain. We were looking at land and saw a large pond

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45 polysyllabic words, the nearest perfect square is 49. (If your count is between two perfect squares, choose the lower number.) The square root of 49 is 7. Add 3 to the square root number: $3 + 7 = 10$. This SMOG grade of 10 indicates that the text will be comprehensible at the tenth grade reading level.



Garden entrance sign (18" x 28") giving visitors primary information about the Garden they are about to visit.

SMOG measures the use of complex words. Reading ease may be improved by shorter sentences, fewer polysyllabic words and plain, everyday language. Sentences should contain 10 to 20 words and 130 to 150 syllables per 100 words.

To be sure a label is successfully communicating information to the visitor, it is a good idea to test it with a sample of the intended audience before actually producing the final product. Along with the communication aspects of the label, the visual characteristics should be tested as well. This procedure requires producing an inexpensive mock-up or facsimile of the actual label and placing it in its proper location. The visitor testing should be done very systematically in an effort to collect reliable information about the effectiveness of the label. If the test results indicate that visitors are missing some important concepts, the labels can then be rewritten or altered to clarify the message.

Legibility

Legibility of a label is dependent on the speed with which each letter or word can be recognized. It is influenced by

Typeface
Century Schoolbook A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z <i>Serif</i>
Helvetica A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z <i>Sans Serif</i>
Optima A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z <i>Transitional</i>
English Script Oblique A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z <i>Decorative</i>
Figure 1

several factors: style of typeface, size of type, line length, line spacing, distance between the viewer and label, and color. Label reading is encouraged by an aesthetic, visually appealing label. The typeface style often determines the appearance of the label. Decorative faces should be avoided; though they attract attention, they are difficult to decipher. Several studies conducted in the field of reading research support the idea that serif type is more legible than sans serif type when used in blocks of copy because people are accustomed to reading it in books and newspapers. In addition, letters that have white space within the letters are more legible. Serif and transitional face generally follow this rule. Studies evaluating museum labels arrive at similar results. Others believe sans serif type is becoming more popular and common as it is frequently used in advertising ads and architectural

signage. It has been suggested that sans serif type will be as legible as serif type in the future as people become more familiar with it. For the present, museum labels should be in a serif or transitional typeface.

Communicating information to the visitor should be the primary concern when deciding on a typeface. There is no need to mix several typefaces in one label as diversity may be obtained by changing the letter weight (bold or medium) or style (italics or regular). Actually, the entire information system (all the labels displayed in the garden) should use the same typeface because a consistent visual image contributes to the legibility of individual labels. As visitors become accustomed to the visual style of the signs, they learn to expect certain kinds of information from each sign. Another factor influencing the legibility of text is the use of upper case letters. Words printed in all upper case letters reduce reading speed by almost 14 percent when compared to a label printed in the typical upper and lower case format. Using all upper case letters also takes up considerably more space. Reading speed is also reduced by italics and bold type if used in blocks of copy.

The size of the letters in a label must be large enough for visitors to read without straining their eyes. The distance between the viewer and the label helps determine the appropriate letter size. Books are generally printed in 10 point type. A label, however, is not used like a book. In a garden area, it is likely that a label will be attached to a stake 12 to 15 inches from the ground. The distance between an adult viewer, standing at an average height of five feet nine inches, and the label may be roughly four and one-half feet. This distance requires the letter size to be 36 points. The basic formula for determining letter size is to increase the size by six points for every nine inches of distance between the viewer and the label. For example, if the distance is 18 inches, the type should be 12 points. If the distance is 36 inches, type should be 24 points. The ratio, distance/point size, is $3/2$. Though garden areas may have several types or levels of interpretive labels with varying installation techniques, blocks of copy with type smaller than 24 points will be strenuous on the viewer.

Another factor affecting legibility is the lengths of the lines in labels. The letter size generally determines the length of the line; the larger the type size, the longer the line. The character count for a comfortable line length ranges from 40 to 65 characters including punctuation and spaces between words. Lines longer than 65 characters may cause the reader to return to the same line rather than the next one. A line that is too short will tire the reader quickly. A good rule of thumb is that the line length in picas should never exceed twice the letter size in points. For example, the line length for 36 point type should not exceed 72 picas (12 inches). The size of the type, length of the line and the typeface determine the leading or the amount of space between the lines. Leading, always expressed in points, increases as the type size and line length increases. Lines without leading are read more slowly than lines with leading. There is not a general rule for leading because typefaces have unique characteristics that affect the amount of leading needed for legible type. After choosing a typeface, type size and line length, have the typesetter set it at different leadings to see which is most legible.



Cardboard mock-up signs are useful for testing the communication and visual qualities of your labels.

The number of lines in a label is a factor that determines how much of the label will be read. Research in museum exhibit halls has found that visitors, on the average, spend 30 to 45 seconds in



Sub-garden sign (6" x 8") explaining more specific information about a particular variety or horticultural technique.

front of any one display area. This is not very much time for a visitor to read a label, observe a specimen and comprehend ideas. A science museum tested labels of varying lengths and found that more of a label was read when there were fewer lines. In addition, the proportion of visitors who read the whole label decreased as the number of lines increased. Though the number of lines in a label depends on the size of the type and the line length, a minimum number of words will produce a short, inviting label. An introductory label, such as one that is placed at the entrance to a garden, may range from 60 to 80 words. Other labels, such as those that may contain more detail about a specific plant or horticultural technique, may range from 40 to 50 words.

Color has an effect on legibility as well as motivation. Though dark colored letters on light backgrounds have proven to work best in indoor situations, the opposite holds true for signs that are placed out-of-doors simply because of the differing environmental conditions. Light colors reflect sun and daylight, while dark colors absorb light. Since there is more background space than copy space on a label, a light color should be used for the copy and a dark color for the background. Avoid using shiny or glossy materials as they are more reflective than matte surfaces.

Illustrations

An illustration or diagram coupled with written facts is often an effective technique for communicating difficult botanical information. Illustrations may also attract attention to the sign and encourage visitors to read the label. Studies have shown that photos and illustrations in museum exhibits help the visitor to remember and understand the content of the exhibit. The placement of a graphic element is an important consideration. A viewer is naturally attracted to the top left side of a layout. This action reflects reading practices. An illustration is more effective in attracting the reader's attention when placed above and to the left of the center of the layout. If there is a caption, it should be placed beneath the illustration.

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VISUAL STYLE SPECIFICATIONS					
Sign size	Type face	Type size (Heading)	Type size (Text)	Line length	Character Count
18" x 28"	Optima	84 point Bold	48/53 point* Medium	90 picas	50
9" x 12"	Optima	48 point Bold	36/40 point* Medium	45 picas	34
				63 picas	47
6" x 8"	Optima	36 point Bold	28/32 point* Medium	42 picas	43
* The point size for a body of text is described using two numbers. The first number indicates the letter size, the second number indicates the leading.					

Figure 2

INTERVIEW

Continued from p. 6

(actually a bog!), and having always loved aquatic and bog plants, we bought it. Fortunately, a house came with the pond! I will probably retire there soon, maybe start a nursery, consult, write, or perhaps just go fishing. Or so I believe. The reality is I am likely to be more involved in horticulture than ever before.

I am very much a botanic garden person; I believe in them fully. In my earlier days at Kew learned people used to write articles questioning the very purpose of botanic gardens. I found that very depressing. Why do people ask questions like that when it is perfectly obvious that plants are the most important organisms on earth? They build our organic world, and no animal life could exist without plants.

Chris Woods is horticulturist/manager of Chanticleer, a garden in Wayne, PA.

DESIGNING LEGIBLE LABELS

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Developing an Interpretive Sign Program

An effective interpretive sign program at a botanical garden and arboretum should have strict guidelines determining the visual style (typeface, size, color and composition), physical characteristics (sign sizes and materials) and conceptual format (levels and types of information made available to the visitor). The interpretive sign program at the Chicago Botanic Garden, though in its infancy, follows specific guidelines for visual design, production materials and label writing.

The specifications for the visual style (see Figure 2) include using Optima typeface in bold for titles, medium for text and italics for Latin names. The type sizes are consistent within each sign size. All copy is silkscreened with white ink onto a dark brown background and composed in a flush left, ragged right format. When illustrations are used they are always placed on the left hand side of the sign. The sign material is of quarter-inch thick anodized aluminum with a dark brown baked enamel finish. The larger signs include wooden posts for support.

Interpretive signs offer the casual visitor a vehicle for obtaining information

about the underlying horticultural and botanical ideas of a garden's exhibited plant collections. A thoughtfully designed sign program increases the effectiveness of that vehicle.

Randi Korn is Interpretive Program Manager at the Chicago Botanic Garden in Glencoe, IL.

CASE STUDY

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bringing the vegetable garden into the whole backyard.

The Experimental Garden will have fruit, vegetable and flower displays that change yearly showing various horticultural techniques as well as new plant introductions and horticultural products. New ideas will be tested and evaluated, yields will be measured and compared, and the home gardener will be able to choose the best ideas and products to fit his own situation.

All in all there will be some 22 different gardens, each with labels and interpretive signs. Docents will provide regular tours, and television stations will use the garden for local programs. All of the area will be irrigated using manual controls. A large area for soil and materials storage has been provided along with a satellite maintenance building.

All of the team expects the Home Gardening Center to be one of the major displays at the garden. True, it will take a lot of maintenance, but it's equally true that it will serve, in a very practical way, all of the citizens in the St. Louis region.

Geoffrey L. Rausch is a partner with the firm Environmental Planning and Design in Pittsburgh, PA, and has been involved in the design of many U.S. botanical gardens and arboreta for nearly 25 years.

INTERPRETATION PLANNING

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a guided walk but unsuitable for a self-guided tour. The *length of stay* is another factor to take into account. Visitors who can only stay for an hour will not be able to participate in the same types of activities as those who spend the weekend in the area. Try to accommodate as wide a range of visitors as possi-

ble by offering a variety of media and events. Strive for *variety* in your interpretive program; select a media mix that will serve people of different ages, languages, physical capabilities and educational backgrounds. The *seasonality* of our institutions is still another consideration. Gardens and arboreta display living plants and so should plan interpretation designed to change with foliage and blooming interest. The number of visitors often corresponds to this seasonality and so may influence interpretive choices as well. *Vandalism and maintenance costs* are additional factors which must be considered in making choices of interpretive programs or materials. Gardens with severe vandalism will not be able to consider certain types of self-guided interpretive materials. With or without vandalism, maintenance costs as well as initial price should be considered in the decision to use a particular type of interpretive device.

Bringing It All Together

One method to draw all this information together is to construct a matrix or media selection worksheet for each major user group. (Feel free to photocopy the blank form included on page 12 and adapt it to your needs.) First, list the main themes you have decided to stress, skipping lines for important sub-themes or particularly good resources to illustrate themes. Now note all possible methods and media your institution might consider using along the other axis. At the intersection of the media and themes columns, note in pencil the methods you are now using to reach the public. You may be surprised to notice that topics such as plant identification are addressed more than adequately, while other important messages are presented to few, if any, of your visitors.

The next step involves synthesis of information gathered in the planning steps outlined above. Consider costs such as staff time and purchase of any materials and equipment. Propose a combination of methods to interpret your resources and communicate your message to your visitors and program participants. Use of the media selection worksheet will not make the decisions for you, but it should show how the parts of your interpretive program will fit together.

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