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Fountains — Water Wasters or Works of Art?

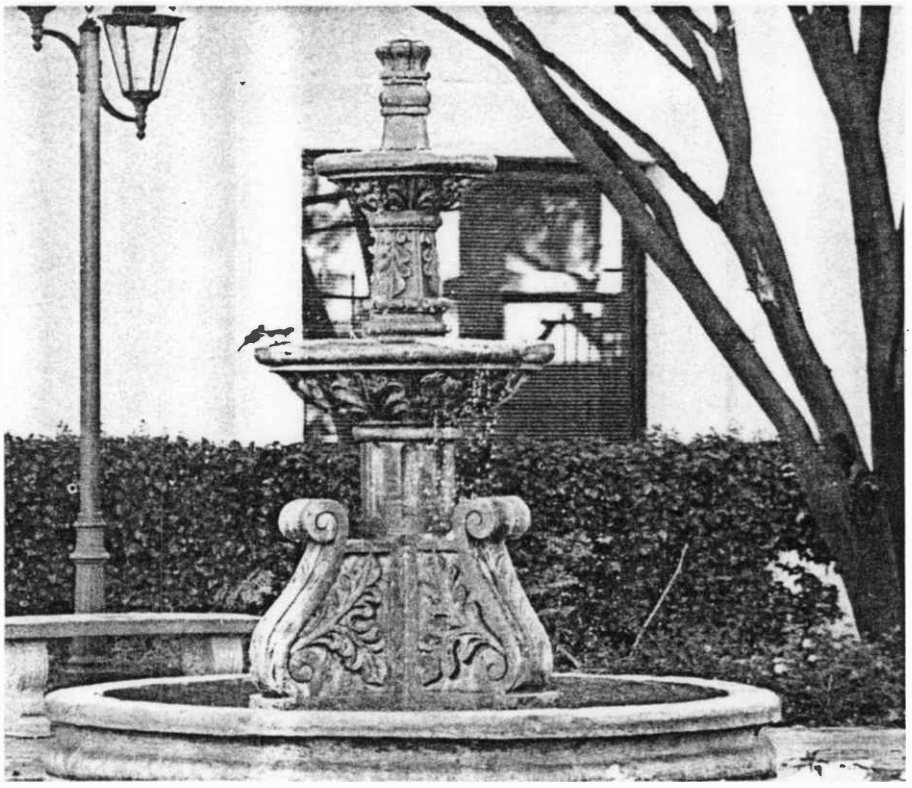
Water and Aesthetics

by Joe Gelt

Decorative water fountains are common architectural features in the Southwest, found in public plazas, malls, in front of government and office buildings and industrial plants, and in and outside private residences. Fountains come in all shapes and sizes, their waters variously displayed, from a slight trickle to a cascading flow to a gushing geyser.

Those of us conditioned by the ubiquitous precepts of water conservation may feel slightly squeamish about these water spectacles. We have been taught that not all water uses are equal, some are of more value than others. Drinking obviously is an essential water use but washing sidewalks and driveways is not. Within a hierarchy of water uses, from essential to frivolous, how should water used within a decorative fountain be classified?

The question has interesting implications. At first glance a water resource issue has been raised. Decorative fountains are water users. In arid Arizona, the water conservation precepts by which we live stress a strict accounting of water use. Fountains therefore are a valid topic for discussion to determine if their use is suitable and proper in a desert environment. Fountains often have attracted criticism as examples of wasting water.



Decorative fountains spout water—and also controversy. (Photo: Kevin Chan)

Fountains raise another issue beyond water supply and demand—the aesthetic use of water. A fountain is designed and installed to create a pleasing and satisfying effect and to attract attention. Water in a decorative fountain is not used for drinking, watering landscape, cleansing, instream flow, preserving an endangered fish, or flushing, and is unavailable for use in any manufacturing or agricultural process, or for settling Indian water disputes.

A discussion of decorative fountains involves other nontraditional water topics as well, such as historical and cultural considerations. Finally, a discussion of water fountains would not be complete until the inevitable

question is addressed: What is the relationship between this mainly nonfunctional use of water and water resource management and public policy?

A Nonfunctional Use of Water

The topic at hand may be decorative water fountains, but the underlying issue of broader implication to water resource management is nonfunctional uses of water. Measured in acre-feet or gallons-per-capita-per-day, water usually is thought of as a commodity, to be bought, sold, regulated and ultimately used and reused. Less attention is devoted to nonfunctional uses of water.

For example, aesthetics is an unlikely item on the water management agenda. It attracts attention only when interpreted as a water quality concern. If water that is otherwise safe to drink has a slight odor or a cloudy appearance its aesthetics may be faulted. In other words, aesthetics is a lesser water quality concern, posing no threat to human health, but affecting the physical desirability of water. Aesthetics determines if water looks and smells good enough to drink.

Environmentalists speak of aesthetic values in a different context when defending free-flowing rivers and streams. Committed to protecting flowing water from pollution and diversion, environmentalists value the beauty of lakes, streams and rivers. They challenge the policy that water must be removed from a river to benefit humans. They argue that the aesthetic benefits derived from flowing water are too often overlooked.

Stressing aesthetic benefits is not always the best strategy for achieving conservation goals however. More ground likely is gained by defending free flowing water because it serves a specific purpose. Admittedly they are beautiful to look at, but unpolluted, free-flowing rivers and streams also are needed to preserve plant and wildlife and for various recreational activities. To further strengthen the case economic benefits of flowing rivers and streams are calculated.

The aesthetics of water seems a less self-conscious topic when decorative fountains are at issue. This might be because, unlike naturally occurring streams and rivers, fountains are human-made, representing a conscious effort to use water to create a pleasing visual and auditory effect. Fountains therefore are a suitable topic for examining a nonfunctional use of water – in this case, aesthetics – and its implications to water resource management.

Fountains Also Provide Practical Benefits

Before discussing the aesthetics of fountains and their water use it might be appropriate to acknowledge that fountains also serve practical purposes. Early acknowledgement of these uses might assuage the anxieties of those who otherwise would be uncomfortable with a topic devoted to water aesthetics.

Fountains provide useful services in advertising. The splash or gush of water rising, tumbling, cascading is an attention grabber, as eye-fetching as a neon sign. And just as a neon sign is deemed more effective with brighter and flashier lights, fountains often are thought to better promote a cause if gushing extravagantly. Such fountains often are used to attract attention to residential developments. Often criticized, Fountain Hills is a prime example.

Fountains also are used for noise mitigation. The sounds of splashing, flowing or moving water can mask bothersome noises. A person seated by a fountain in a park or courtyard hears the fragile sounds of water rather than distracting city noises. Although mitigating noise is a practical application of a fountain, the desired result is to create a more pleasant environment and thus an aesthetic purpose also is served.

Fountains sometimes are specifically designed and installed to mitigate noise. A fountain's ability to mask noise is in direct proportion to the loudness of its water sounds. A fountain with a high-pressured flow dropping or falling from a significant height into a pool or onto a hard surface would create clamorous water sounds. These could mask relatively high volume noises.

The surrounding area or setting of a water fountain also affects its potential to mitigate noise. For example, a fountain in a courtyard surrounded by adobe walls creates a different effect – a softer, more absorbed sound – than does a fountain amidst tile or stainless steel surfaces. The latter reflects more sound and has more potential to cover louder noises. The presence of walls or other surfaces can focus and direct the sounds of a fountain.

A fountain also can be used to cool an area. For cooling to occur, a fountain must be active, with water

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and air mixing to encourage evaporation and a cooling effect. The more interaction between water and air, the greater the potential for cooling. For example, a reflecting pond, with a smooth, flat surface, obviously exposes less water to the air than does a misting system spraying small particles of water directly into the air. A fountain that sprays water into the air thus cools more effectively.

A fountain's potential to cool an area also depends upon ambient conditions. A fountain located within an open plaza surrounded by concrete won't provide much relief from the heat of the sun. More comfort would be provided by a fountain within an enclosed area with shaded surfaces. Fountains installed on the north side of buildings and walls are sheltered from the sun and thus provide better cooling. Trees and vegetation also provide shade.

By increasing evaporation and dispersing the cooled air, air flow or currents also influence the cooling potential of fountains. In the Middle East fountains are designed to better take advantage of air flow to increase a cooling effect. A small hole or opening in a wall would capture the prevailing wind, concentrating and directing it over the fountain. Increased evaporation results, and the cool air is transported beyond the fountain and into the interior of courtyards or buildings.

By creating micro-climates, fountains can make a cooling difference within a relatively small area or zone. Fountains are not a likely strategy, however, to mitigate the heat island effect of large urban areas. The heat absorption of the urban mass is too substantial for fountains to counteract its effect on a large scale.

Described above are practical uses of fountains, from advertising to creating physical comfort. Such uses can be evaluated to determine whether they provide sufficient benefits to justify their water consumption. For example, as will be discussed later, the City of Phoenix decided fountains used for advertising were not a justified use of water.

Unlike the useful and practical, the aesthetic is more difficult to evaluate. Are the aesthetically pleasing water effects of a fountain a justified water use? How is the beauty and satisfaction of a fountain evaluated?

San Ildefonso pottery design of a bear

The Aesthetic Benefits of Fountains

Along with serving practical purposes, fountains also provide aesthetic benefits. All fountains, even those designed for a specific use, are generally aesthetically pleasing. To cool air or mitigate noise, water must move, and moving water attracts and appeals. Aesthetics therefore is built into almost all fountains.

At their best fountains are monuments to the fascination of water. That water is beautiful, even in an irrigation ditch or flowing from a tap, is easily overlooked. Water play in fountains is water out of the context of every-day usefulness and provides an opportunity for humans to appreciate the power and attraction of water. Fountains especially allow urbanized people, far removed from natural sources of water, to indulge in the pleasures of free flowing water.

Water has an emotional or aesthetic appeal that, if noticed at all, often is seen as irrelevant in the face of challenging water resource issues. When the theme is broached, it usually is in the context of Native American cultures. Through religious beliefs and ceremonials, Indians honor rain and water as a gift bestowed to benefit humans, a gift they, in turn, respond to with affection and gratitude.

That modern society does not have cultural beliefs or rituals to honor water does not mean the affective or aesthetic qualities of water go unnoticed or unappreciated. Water indeed fascinates all humans, regardless of their cultural background. Something ingrained within the human psyche responds to the splash and flow of water. Water soothes and relaxes, inspires reflection, and is a source of beauty. Further, water has spiritual qualities recognized in religion and ritual, from baptism to death.

An interdisciplinary study of water often is lauded as a sound strategy for broadening and deepening an appreciation and understanding of water issues. Usually, however, interdisciplinary methodology refers to studies that include the physical sciences and the social sciences; e.g., hydrology and economics. Possibly interdisciplinary water studies could cast a wider net to include areas generally understood as the humanities. History and aesthetics might be areas worth including.

The Arizona Humanities Council sponsored such an interdisciplinary effort during its November 13 and 14 conference. Conducted in Prescott and titled "The Second Opening of the West," the conference included an interdisciplinary examination of various natural resource issues. Issues were examined through the perspective of art, philosophy, and history.

For example, Helen Ingram,

director of the University of Arizona's Udall Center, presented a paper titled "Place Humanists at the Headgates." She argued that engineers, economists, lawmakers, lawyers and political entrepreneurs have competed to define and resolve water issues. Serious water problems have resulted. She believes that western water policy would benefit if humanists speaking through literature were more often heeded.

Desert Southwest as Suitable Locale for Fountains

More than other geographical areas of the United States, the Southwest provides a fitting setting for fountains. Fountains are a Southwest artifact, a regional symbol. A study of the region's history, culture and environment would show that fountains very much belong in the Southwest.

The origin of fountains in the Southwest can be traced to Spain and its involvement in the New World. Fountains are a distinguished feature in Spanish architecture, derived, in part, from Moslem influences. As Spain built its colonial empire in the New World, fountains were installed within plazas and courtyards, as early as the 16th century.

As Spain's empire grew, its architectural influence spread, eventually extending into what now is southwestern United States. After Spain, an independent Mexico ruled this territory, only to lose most of it in war to the United States. When the historical dust settled, the Spanish and Mexican heritage continued in the Southwest, even into the present, its most popular physical images include tiled roofs, adobe walls and fountains.

Fountains remain a popular image in the Southwest today, a symbol variously employed, in art and popular culture. A fountain may be an artistic detail embellishing a new building, or a prop in a western film, or a fixture to add atmosphere in a Mexican restaurant. Whatever their uses, fountains are widely recognized as a colorful detail of Southwest heritage, part of a tradition extending from the Spanish colonial era to the present.

That the Southwest is an arid environment adds to the regional appeal of fountains. This at first might seem a contradiction. After all, in an area where every drop counts, fountains offer a spectacle of water use. Yet it could be argued that not only are fountains not out of place in the desert, but they serve a special purpose not shared by fountains installed in areas with more visible and abundant water from rain, lakes, rivers or the ocean.

Because deserts are dry and receive little rain, desert dwellers do not often encounter naturally occurring sources of water, especially if they live in urban areas. An appropriately designed fountain then need not be an anomaly in the desert but a creative response to the human need for contact with water, a need not readily satisfied in the desert.

Further, a suitably designed or desert-adapted fountain complements the natural aesthetics of a desert. Deserts are dry, with little water. A desert fountain with a managed or frugal flow expresses water scarcity. In effect, water scarcity is the theme of the fountain, its design inviting a higher appreciation of water as a scarce and fragile desert resource.

Public Perception of Water Fountains

Designed to attractively display water, fountains are water spectacles, dripping, flowing, splashing, jetting into the air. Fountains therefore represent a very conspicuous use of water. As such they attract notice and comment in ways that other water uses, those occurring behind the scenes or in private, do not. In a society ruled by the dictates of water conservation, we all are "water cops" to some extent.

For example, a decorative fountain in front of a large apartment complex readily attracts notice and, more than likely, critical comment. Meanwhile, passerbys are not likely to speculate whether low-flow toilets are installed in the individual apartments within the complex. Unlike fountains, low-flow toilets tend not to be a matter of public notice or concern.

The public's perception of water fountains therefore is an important consideration when determining policies regulating water feature design standards. The Design Review Board of Phoenix commissioned a survey in January, 1992 to better understand public attitudes and opinions regarding decorative outdoor water features.

A majority of respondents expressed a negative opinion of fountains by opposing their installation in new developments, Phoenix citizens by a 3:2 margin, with other Maricopa County residents objecting more strongly by a 2:1 margin. Further, both Phoenix and other county residents supported the passage of an ordinance by local government to prohibit new developments from having decorative outdoor water features. Other county residents favored such action by a 3:2 margin, with Phoenix citizens more evenly divided on the issue. Those in favor of such an ordinance were concerned about the potential waste of water and the need to conserve.

The survey measured other matters besides water use. For example, it posed the situation of a developer permitted to install a fountain, and respondents were questioned about its proper placement. Only one in five supported locating the fountain out front, in view of passing motorists. The majority believed the fountain

should be located in a more sheltered position for the enjoyment of the general public, including shoppers, pedestrians or those working in the development. Two thirds of the respondents opposed water features for commercial purposes, i.e, for attracting attention and customers.

These responses demonstrate a discriminating attitude about fountains and what they represent. Respondents are aware of the potential benefits of fountains. They believe fountains are to be viewed close up and are to be appreciated directly and personally. Further, the public or civic value of fountains does not transfer to commercial applications. For many people commercial uses of fountains are unjustified. Finally concern about excessive water use inhibits public appreciation of decorative fountains.

Regulating Fountains

Not perceived as heavy water users, fountains are not subject to many and varied regulations. The Arizona Department of Water Resources requires that water used in decorative fountains be recycled. Cities and counties also may have regulations pertaining to fountains. For example Tucson's plumbing code underscores DWR's concern: "All fountains, waterfalls, and other decorative water-using facilities shall be equipped with water recycling or reuse systems."

Phoenix has done more to regulate and control fountains than most Arizona cities. Fountains concerned Phoenix officials because of the image or message they conveyed, more than their actual use of water. No figures existed indicting fountains as extravagant water users, but officials feared they expressed the wrong idea of water use in the desert. The image of a fountain against a desert backdrop was not seen as good for water saving morale.

(Tucson Water officials confronted the same issue. Plans for their new office building included a water feature. Although the feature would not use excessive amounts of water, officials rejected the idea because the fountain might be perceived as a water waster.)

San Ildefonso hunter design

Phoenix officials wanted to discourage fountains serving mainly as roadside attractions to beckon the attention of motorists. Such fountains might be in front of buildings or developments and viewed mainly or solely by passing motorists, without providing civic and social amenities. The intent of such fountains often is to attract attention or invite business; in short, to advertise.

To discourage such water features, Phoenix passed an ordinance banning fountains seen from the road. Located in areas where people did not gather, the fountains were considered not within an environment conducive to human appreciation and enjoyment of water.

By requiring that fountains benefit on-site users, city officials were urging a very traditional use hearkening back to Spanish colonial times. In Spanish culture fountains served as a gathering point for people to meet and socialize.

Fountains also are mentioned in Phoenix's drought management plan. Considered an unnecessary use of water, fountains would be shut down early in the event of drought.

Along with siting regulations Phoenix has design specifications to encourage developers and designers to plan fountains that minimize water use. For example, the size of the catch basin is important. The radius of a catch basin should be at least twice the height of a stream of jetting or falling water to ensure its complete capture. Otherwise water falling into the catch basin would splash outside the fountain and be wasted.

Water conservation devices also are recommended for fountains. For example, wind shut-off valves can be installed on fountains to turn off water flow during windy periods when evaporation is high. Such fountains are equipped with anemometers to measure wind conditions. Also timers can be installed to turn off fountain flow at night when it is less likely to be observed.

Phoenix's fountain rules evidently were viewed as a regulatory hybrid. Difficulties arose finding an appropriate home for them among various city departments. Are fountain regulations to be considered a zoning, land use or a water use issue? The matter was settled by including the regulations within the design review standards ordinance, an amendment of the zoning ordinance.

Creative Desert Fountain Designs

Building fountains in the semi-arid Southwest challenges the water ingenuity of designers. Their task is to design a fountain compatible with the natural aesthetics of the desert scene. Central to the desert environment is water scarcity, often viewed as a liability, but which is in reality a condition of life in the desert, like warm temperatures and the abundance of sunshine. Such desert conditions help determine appropriate fountain design.

(Another school of thought exists, however, guided by what might be described as an anti-desert or oasis mentality. It begins with the premise that the desert is a hot, forbidding and hostile place. The rationale for a fountain then is to counteract this condition and to redeem the desert with an abundant and extravagant flow of water.)

Creating an appropriate design for a desert fountain includes identifying a source of water in a water-scarce environment. Also, such a fountain must use water efficiently to meet water conservation expectations. The best desert fountains also express or interpret through their design and water use some aspect of the physical or philosophical reality of the desert.

A strategy for obtaining a water source for a fountain is to double up on a present water use. This involves taking water already serving a specific purpose and using it in a fountain, while maintaining the original use of the water. For example, designer Steve Martino constructed a fountain located along a Salt River Project canal. Water is pumped from the canal to flow through the fountain before returning to the canal.

Martin Karpiscak of the University of Arizona's Office of Arid Lands Studies also suggests a possible double-up approach to fountain design. He believes that cooling towers might be redesigned to create attractive fountains. Constructed to serve practical ends, a cooling tower usually is without any decorative embellishments, consisting mainly of a boxy-shaped structure to facilitate evaporation for cooling.

Karpsicak says a problem to overcome is protecting observers from any chemical and biological factors drifting from the cooling tower/fountain. Research is needed to ensure the safety of such devices.

A redesigned cooling tower still would be true to its original purpose but also could provide aesthetic benefits as a fountain, with waters publicly and attractively visible. A cooling tower-cum-fountain nicely combines the functional with the aesthetic.

The idea gains additional favor considering that cooling towers often are installed at large facilities serving the public: hotels, office buildings, hospitals, etc. Such locations include public gathering areas, which usually are choice settings for fountains.

Ralph Martin of Design Services in Phoenix also would link fountains with cooling towers, but would not combine them into a single structure. Instead Martin suggests that a decorative fountain could clean and cool water that feeds into a cooling tower. Along with doubling up on water use, this arrangement would increase the efficiency of the cooling tower. Pre-cooled water more readily evaporates in the tower, and fewer chemicals would be needed for cleaning and purifying the water.

An additional benefit is gained. By serving as a component of a cooling tower, a fountain justifies its continued operation during drought. Its link with cooling tower operations raises a fountain's water-use status beyond the mere decorative, and the fountain thus is no longer considered inessential during drought, when less functional fountains likely would be shut down.

Fountains also have been designed to use harvested storm water runoff. Sufficient water storage capacity would need to be designed into facilities to store adequate water for use in water features.

Martin Yoklic of the UA Environmental Research Lab described a fountain ERL designed tying water flow to local climatological conditions. The fountain displays a variable flow of water depending on climate or weather. For example, in June, before the summer showers fall on the desert, the fountain would be dry or only have a slight trickle.

When heavy rains occur, the water would be stored in a cistern to gush through the fountain. As the cistern empties the flow would diminish to a trickle or stop. With the flow varying at different times of the year, the fountain provides an interpretation of the seasonal water supply. The fountain was worked out as a concept, but was never constructed.

The fountain is designed to respond to precipitation like a wash or an arroyo. Its varied water flow, from abundant to scarce, reflects the occurrence of water in the desert. The fountain displays not just water but also the scarcity of water.

A fountain in Paolo Soleri's Scottsdale studio consists of a pipe slowly dripping water into a stone basin. The drip never fills the basin, which does not have a drain, because the rate of evaporation matches the slow regular dripping of the water. This slow and restrained water display demonstrates that water is scarce, and its beauty is evident in its scarcity, even in a single drop.

Fountain Hills, the World's Largest

If Arizona officials were so inclined they probably could promote the state as having the world's smallest and largest fountains. The dripping fountain in Paolo Soleri's studio might qualify as the world's smallest; ten miles away is the world's largest, the fountain at Fountain Hills.

Indeed, no discussion of fountains in Arizona would be complete without mention of Fountain Hills, a planned community just east of Scottsdale and thirty miles from downtown Phoenix. Landmark and symbol of the community is a 560-foot jet of water emerging from a 30-acre artificial lake. The fountain and lake are located within Fountain Park, 32 acres of landscaped grounds.

This super stream of water is

promoted as being the "World's Highest Fountain" and is listed in the *Guinness Book of World Records*. It is said to be bigger and better than the 435-foot Le Jet D'Eau in Lake Geneva, Switzerland and the 500-foot New Point Fountain in Pittsburgh and is three times as high as Old Faithful Geyser in Yellowstone Park. The column of water reaches five feet higher than the Washington Monument and ten feet higher than Notre Dame Cathedral in Paris. It jets 110 feet higher than the Great Pyramid of Cheops in Egypt.

The fountain recirculates reclaimed water from the artificial lake. Fountain Hills literature states that at full operation water pressure at the nozzle is 375 pounds per square inch flowing at a rate of 7,000 gallons per minute. This results in a velocity of 68.5 feet per second launching more than 8 tons of water (approximately 2,000 gallons) above the nozzle at any one time.

Weather and wind velocity permitting, the fountain operates for 15 minutes every hour on the hour between 10 a.m. and 9 p.m., seven days a week. Operating on this schedule less water is said to evaporate than is used to irrigate an acre of cotton in a year. The 30-acre pond, however, evaporates as much as 35-45 acres of cotton.

The developers constructed the fountain and the surrounding lake as a thematic centerpiece for the designed community. Visible from every vantage point in Fountain Hills, the fountain is described in the promotional brochure as "symbolic of the spirit and enterprise of the people who live in this sunny, southwest region."

Other people interpret the fountain in Fountain Hills as a different kind of symbol. Viewing it as water folly on a colossal scale, they believe the fountain symbolizes an arrogant disregard for the natural conditions of the desert

Public Policy Implications

Water policy makers have addressed aesthetics with less frequency than have other public policy interests. A timely question therefore to address is: What has the beauty of water got to do with hydrology and water policy?

In response, a case might be made that understanding the aesthetic appeal of water is not without practical application. For example, how a society interprets or responds to an important natural resource such as water at the emotional and intuitive levels tells much about that society's values and beliefs. These, in turn, are basic in determining appropriate public policy.

Laguna bird design

Critics may fault this reply as too abstract or even philosophical to fit a water resource agenda. A more convincing case might then be made by describing how an appreciation of the aesthetic qualities of water might affect a specific water policy issue – water conservation, for example.

As preached and practiced, water conservation often is a forbidding affair, with water treated almost as a contraband substance, its flow and use controlled, restricted, and proscribed. As a result, water becomes less a source of joy, less a substance of pleasure and beauty. Instead, water is seen as a sort of endangered specie, its diminishment more to be feared than its qualities appreciated. Instead of providing satisfaction, its use provokes guilt.

Further, water becomes a commodity to be weighed, measured, and meted out. It may seem paradoxical, but as we become more self-conscious about water use, we seem to become less conscious of water. Water's aesthetic and emotional appeal is overlooked.

A better public policy strategy might be devised than one that conveys the message that water use is something to be minimized or even defeated by water conservation. Instead it could be stressed that conservation is not so much about prohibiting water use as using water wisely. Such uses are many and include those that encourage a respect and understanding for the emotional and aesthetic power of water.

Fountains can help develop this awareness. When put to various human uses, water is most creatively and artistically displayed in decorative water fountains. By encouraging people to value water, fountains might more effectively promote conservation than a strategy that instills guilt at using water.

Conclusion

Fountains may not be favored by some people who are committed to a water conservation ethic. Such people often view fountains as representing a conspicuous consumption of scarce water resources. Not only do they use water, but the splash and flow of fountains flaunt this dubious use of water.

It could be argued, however, that in its wisest manifestation a fountain reflects the state of the desert, even its dryness. Further, historical and cultural factors justify fountains in the Southwest.

But most importantly fountains do not necessarily use excessive amounts of water. Objections to fountains most often arise because they offer a public display of water use, whether splashing about or slowly dripping. In a water-scarce state this is considered in poor taste. Also, this splash or drip seems not to be serving any serious water resource purpose.

Such criticisms, however, may be overly severe, possibly representing the water conservation counterpart to the puritan ethic. By providing people the opportunity to experience the fascination and pleasure of water, fountains encourage them to value water for its beauty and the physical and psychological satisfaction it offers.

Perhaps therefore a more tolerant view of fountains is worth encouraging. With such a view even the more outlandish fountains in Arizona, those justifiably maligned for excessive water use, might be regarded more leniently. They could be seen as a goodly principle gone awry, possibly like fine music played too loudly.

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The ideas and opinions expressed in the newsletter do not necessarily reflect the views of any of the above people or organizations.

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