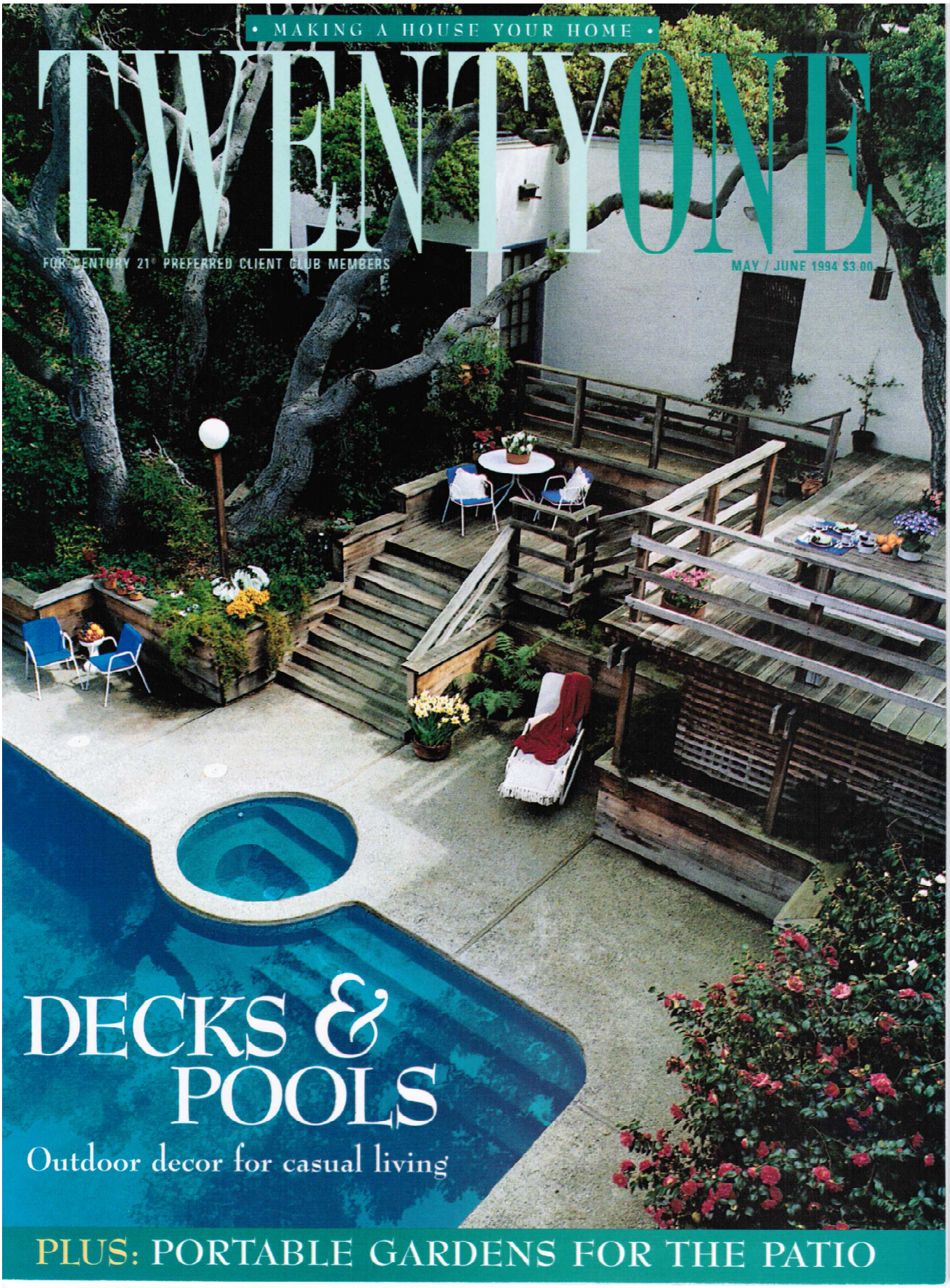
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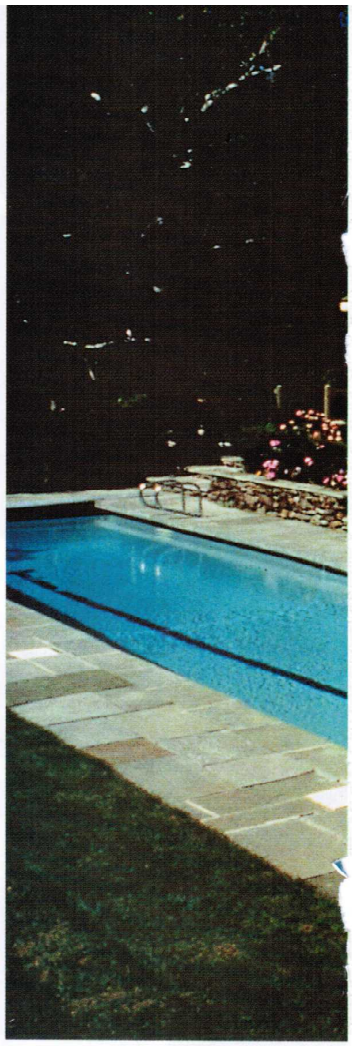
Water Works

Pool & spa trends focus on active lifestyles, minimum maintenance and safety procedures



The lap pool (above) and whirlpool (below) are gaining favor with homeowners who want their residential pools to accommodate a variety of recreational and therapeutic activities.

Gone are the days when residential pool owners would be satisfied with a traditional free form or kidney-shaped pool. The ornamental pools of past decades were aesthetically pleasing and nice to play in or cool off in, but not good for much else. Today, new pools are being built and older pools are being renovated to reflect the needs of an aging population, and to satisfy pool owners with more active lifestyles. The trend in pool design is toward building shallow pools which utilize the benefits of moving water, and in which the owner can swim laps, water walk, or participate actively in a variety of recreational and water fitness games and activities.

Spas are also gaining in popularity. What exactly is a spa? "Spa" is a generic term used to describe a category of aquatic facilities which utilize warm or chilled water for its therapeutic value. Whirlpools, jetted bathtubs, ice baths, swim spas, flotation tanks, environmental enclosures, mineral and mud baths, and wooden hot tubs are all considered spas.

The installation of hydrotherapy and counter current swim jets, as well as water workout machines and a wide variety of water fitness products is common today. The pools and products are desired for the safe and convenient means of exercise they allow, and for their therapeutic value in relieving stress or minor pain associated with arthritis or lower back problems.

The National Spa and Pool Institute estimates that there are approximately 3,303,000 in-ground, and 2,840,000 above-ground residential swimming pools, and 2,682,000 residential spas in the United States. Lap pools, swim spas and pool-spa combinations are be-

BY ALISON OSINSKI, PH.D.

coming most common. For many homeowners, a pool is an attractive alternative to the high cost of family vacations. Increasing concern about polluted natural waters and waste products washing up on beaches adds to the appeal of your own backyard oasis.

In the past, pool industry surveys have identified "cost and time involved in maintaining and operating a backyard pool" as one of the major concerns of potential residential pool buyers. Now there's good news for those considering the purchase of a pool. Many formerly labor intensive pool operating functions can be automated. These include operations such as chemical additions or adjustments, monitoring of pool chemistry, temperature maintenance, backwashing and filter cleaning, even removal and storage of insulating pool blankets. Companies such as Polaris Pool Systems and Arneson Automated Pool Cleaners offer automated pool cleaning systems that vacuum, scrub and sweep floor and walls automatically, leaving you free to enjoy the water. Automation eliminates the need for a homeowner to spend his or her leisure time taking care of the pool. In addition, pool equipment, including heaters, circulation pumps and underwater lights have been redesigned and are much more energy efficient than their predecessors. And there are many add-on products which will substantially reduce time spent on maintaining a pool.

COURTESY OF THE NATIONAL SPA AND POOL INSTITUTE

CHLORINE ALTERNATIVES

There is really no such thing as a "chemical-free" pool. However, there are several products or methods of chemical generation which reduce the amount of purchased chlorine needed to sanitize and oxidize pool water, while still enabling the pool owner to maintain excellent water quality and clarity. Chlorine or some equivalent product must be added to pool water in order to kill bacteria and other harmful disease causing pathogens, and to remove unwanted organic waste products, such as body oils, suntan lotions, cosmetics, hair care products and deodorants, which bathers impart to the water.

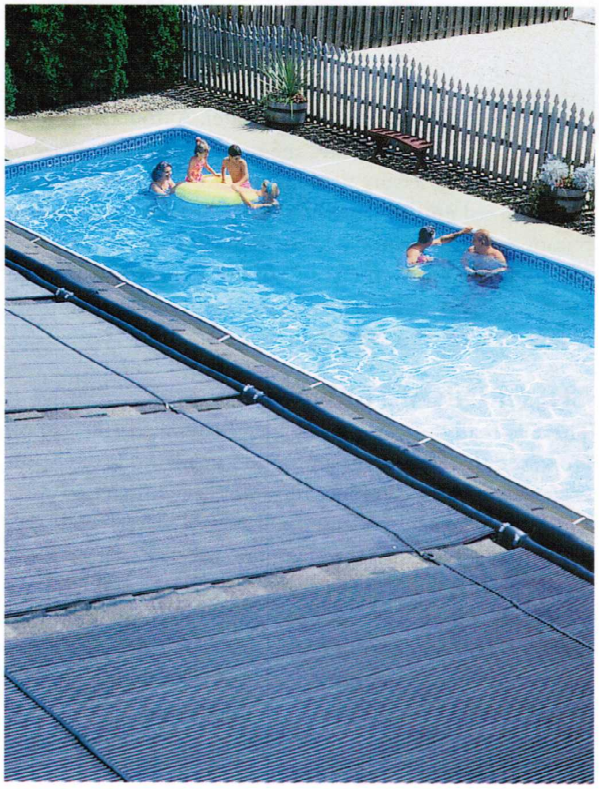
Alternatives to using chlorine include bromine-based products, ozone, hard metals and polymeric biguanide. Salt can also be purchased and used to generate chlorine on-

site, eliminating the dangers associated with transporting, storing and dispensing chlorine.

Bromine. Typically in the form of bromo-chloro-dimethylhydantoin (or BCDMH) which is a mixture of both bromine (66%) and chlorine (27%). Sold in 1-inch or 3-inch white tablet form and introduced into the pool through an erosion-soaker feeder. It is less irritating to bather's eyes, mucous membranes and skin; produces very little odor compared to chlorine; more active at pH levels maintained in pools; and more stable in heat and sunlight. Bromine is a good choice for indoor, warm water pools and spas. However, bromine is not as effective an oxidizing agent as chlorine. It may impart a dark green tint to the water, and may stain pool walls. It cannot be stabilized to prevent dissipation due to sunlight.

Ozone. Two common methods of producing ozone exist — the corona discharge method and the ultraviolet light method. The result of using ozone is better smelling and better tasting water. Ozone is drawn to bacteria and explodes bacteria walls on contact. Ozone is also an excellent oxidizing agent — thousands of times faster than chlorine at removing organic contaminants from the water. Ozone is inexpensive to use once the generating system is installed.

Ozone's major advantages are that it causes no eye irritation to swimmers; there is less total dissolved solid build-up; it helps remove metals from the water; it prevents calcification; and it has no effect on pH or total alkalinity. Because ozone leaves no residual for killing bacteria about to be introduced into the water, it must be used in conjunction with chlorine or bromine if continuous disinfection of pool water is desired.



Solar heating systems help reduce energy costs as well as extend the hours of pool enjoyment.

What does it cost to build a typical pool?

Innovative technologies applied to pool design, construction and maintenance are creating new products which make owning a pool more affordable and easier to care for than ever before. Today there is a pool to fit almost any household budget.

$800–$5,000	**Residential above-ground pool**
$5,000–$15,000	**Residential on-ground pool**
$3,000–$5,000	**Residential spa (portable)**
$5,000–$8,000	**Residential spa (acrylic)**
$9,000–$12,000	**Residential spa (gunite and plaster)**
$7,000–$25,000	**Swim spa**
$15,000–$30,000	**Residential in-ground pool**

Prices do not include the cost of decks, landscaping, soil preparation or stabilization, or room additions, and may vary depending on geographic location.

Ionization of Metals. The use of hard metals allows a reduced dependence on the use of halogen chemicals such as chlorine or bromine in treating pool water. Regardless of claims made by many manufacturers and distributors of ionization systems, they should be used in combination with low levels of chlorine or bromine. In most ionization systems, a low voltage DC current is passed through a set of copper and silver metallic electrodes set slightly apart from each other in the recirculation lines before the filter. The silver imparted to the water acts as a bactericide, and the copper ions act as an algicide.

If copper levels become excessive, staining and water discoloration may occur. Swimmers' hair and fingernails may begin to turn green. Cyanuric acid, the stabilizer in chlorinated isocyanurates, if inadvertently used for shocking pool water, may precipitate in the presence of silver ions and cause a black stain to form on the walls and equipment. High total dissolved solids levels may reduce ion formation because the flow of current between electrodes is inhibited. The water must still be superchlorinated or shocked regularly to oxidize out organic contaminants.

COURTESY OF AQUATHERM INDUSTRIES, INC.

Polymeric Biguanide. This blue, chlorine-free liquid is similar to the anti-microbial scrubs used in hospitals. It works as a disinfectant by destroying bacteria cell walls, and is used in conjunction with a clarifier, an algicide, and a hydrogen peroxide oxidizer. While the cost of using polymeric biguanide at the recommended 30–50 ppm is higher compared to some alternatives, it does not alter the pH of pool water, and corrosion and calcification do not result from its use. It does not cause bleaching, and that is a major advantage, according to Zeneca Inc., manufacturer of the Baquacil® chlorine-free system. Users don't have to worry about bleaching bathing suits and hair turning color, and will experience less irritation to skin and eyes than with a chlorine system.

Chlorine Generators. Water treatment costs are low when chlorine generators are utilized. One pound of chlorine can be produced from 1.67 pounds of salt. Chlorine generators eliminate the hazards associated with storing and transporting chlorine. To generate chlorine, electrolytic cells, or chlorine generators, change non-iodized salt or low calcium and magnesium salt (salt pellets like those used in water softeners) into 100% chlorine gas by electrically separating the chlorine from the by-product sodium hydroxide. Two methods of generating chlorine are available to the pool owner — the brine or off-line method and the electrolytic or in-line method. Most pools in Australia, for example, are sanitized using the in-line method of chlorine generation. Pool owners should be aware that chlorine generating equipment must be cleaned and maintained regularly to prevent fouling. And with the in-line method, pool water has a slightly salty taste.

Alison Osinski is an aquatic consultant whose San Diego-based firm, Aquatic Consulting Services, specializes in aquatic risk management, aquatic facility design and renovation, and swimming pool chemistry, maintenance and operation. Dr. Osinski also offers a "Swimming Pool Hotline" at 900-446-6075, ext 820.

Barriers & Safety Devices

Numerous communities have recently passed new or revised pool barrier codes. Most of the new codes recognize the need for adequate fencing, as well as the importance of installing safety covers and alarms. Although not a substitute for constant adult supervision, properly installed and maintained barriers can reduce the likelihood of pediatric submersion accidents by preventing young children from gaining access to a pool.

Safety covers prevent access to the water. The covers must be fully secured or locked to the deck, be capable of supporting 400-pound-per-square-foot load, and must bear an identification label indicating the name of the manufacturer and installer, and compliance with ASTM safety cover standards. The covers must be designed in a way which prevents the accumulation of standing water on top of the cover, or be provided with automatic auxiliary pumps which prevent water accumulation.

A yard should be enclosed with a fence at least six feet in height. The pool should be completely surrounded by a fence, or a barrier should be installed between the house and the pool, in order to protect children living in the house. However, fences and plants should not block the view of the pool from the house.

If no physical barrier is installed between the residence and the pool, a resettable alarm should be installed on all sliding doors and windows which open to the pool area. Latching devices should be installed out of the reach of small children. Alarms can be installed to detect entry onto the pool deck or warn if children or pets fall into the pool or spa.

A fence should not have any external footholds or handholds or horizontal bars which make it easy to climb. The fence should be installed in such a way to prevent the fence itself, other objects, building walls or permanent or temporary structures from being used to climb into the pool area. There should be no holes or spaces in the fence where children could slip through. Openings in wrought iron fences should not be more than 4 inches apart. The size of holes in a chain link fence should not exceed 1 3/4 inches. There should be less than 2 inches of space between the bottom of the barrier and the ground or pool deck.

Gates should open outward and be at least as high as the required height of the fence. Gates should be locked when the pool is not in use. The locking mechanism should be shielded and mounted on the inside of the gate, and located at least 4 feet off the ground, and more than 6 inches below the of the top of the gate. The gate closer should be adjusted regularly to make sure the gate self-closes and positively self-latches from any open position.

To prevent drownings in home pools and spas:

- Supervise children at all times when they're around the water. Never leave children unattended for even just a few minutes.
- Keep a portable telephone by the pool.
- Install and properly maintain a multiple barrier system.
- Teach your children to swim, and to enjoy, but respect the water.
- Don't rely on flotation devices or toys to keep a child afloat.
- Purchase rescue equipment and have it available for immediate use near the pool. Learn basic rescue skills, CPR and first aid.
- Teach your children good water safety habits. Enforce pool rules.
- Keep toys, tricycles and other items attractive to children away from the pool when it's not in use.
- Don't allow the pool to be used if: water clarity is poor, electrical storms are in the area, main drain grates are broken or missing, or the pool cover has not been completely removed from the surface.