The Evolution of the Swimming Pool

By Paul F. Ampey

"Pool is a pool is a pool is a pool." Actually, the correct words are, "Rose is a rose is a…" and so on. The line, from Gertrude Stein's poem "Sacred Emily," written in 1913, was intended to propose that "once there, a thing (such as a rose or pool) is what it is and will always be there."

In ancient times, the term "pool" was known as "thermae," which meant a public bathing establishment. The oldest thermae systems in the world date back to the second century before the Christian era with construction of the Stabian Baths of Pompeii, Italy (Fig. 1), which are the oldest and still exist today. The origin of the term "pool," however, goes back to the early Roman and Greek eras. It originally meant a container of water that functioned as a potable water storage tank used as a fish hatchery or a place to swim. In the Roman house, the pool was the impluvium that collected rainwater and, on a larger scale, pools formed part of an aqueduct system for collecting and distributing water throughout major cities. Lastly, the thermae of cities were public bathing establishments known as "natatoriums." Architecturally, they consisted of a large central space with vaulted ceilings, heated by steam and surrounded by smaller rooms, decorated with marble or mosaics.

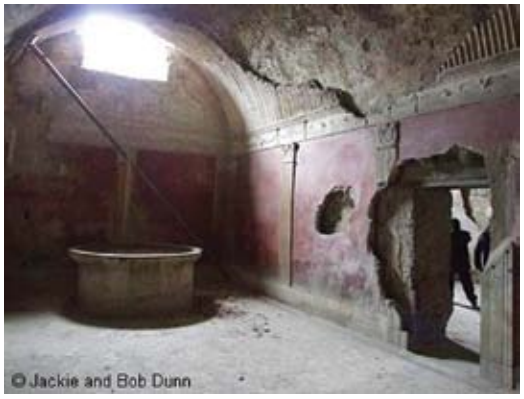

Fig. 1: Historical Stabian Bathes, Pompeii, Italy


Fig. 2: LaCourone Garden, seventeenth century

Over time, pools have served as a place for recreation and cleanliness as well as a place to stimulate genuine physical and psychological well-being. Garden pools of the seventeenth century were constructed in domestic settings designed for visual and auditory enjoyment for persons seeking a source of reflection and inspiration. These pools may have been the first "backyard" variety (Fig. 2). Pools have evolved in many ways and uses. Today, water as a source of health plays the starring role.

Although water covers 70.9% of the Earth's surface, humanity is continually building structures to encompass it for use on land to quench its need for recreation, exercise, competition, and relaxation. Today's swimming pool contractor takes into account many factors in the design and construction of water features. First and foremost, the client: what is their need and purpose? Today, our planet is dotted with water theme parks (Fig. 3), commercial and residential pools, and spas—all to service these needs.

Once the purpose is identified, the design takes place and materials are chosen. One of the major components of a pool is the shell; the majority of shells are constructed with concrete. Concrete, made from mud, straw, and water, has been around for about 10,000 years and the earliest pool shells


Fig. 3: Rapids Water Park, West Palm Beach, FL

Fig. 4: Batching truck with rotary gun for dry-mix application

were also fabricated from it. The process of pneumatically placing a mortar mixture onto various surfaces with a high-velocity "cement gun" was invented in 1907 by Dr. Carl E. Akeley. The term "gunite" was patented and the creation of the Cement Gun Company (now known as Allentown Equipment) began. During the 1930s, American Railway Engineers introduced coarse aggregates to the process and described it as "shotcrete." Although the term "gunite" will probably always be with us, the industry is slowly recognizing both processes as "shotcrete—wet or dry." Shotcrete can be considered a contemporary method that has become highly significant in today's swimming pool construction industry because of its flexibility and ease of placement. The materials used in both wet- and dry-mix processes are generally the same as those used in conventional concrete placement—portland cement; supplemental cementitious materials (microsilica, fly ash, and slag); aggregates; and water, with the difference being that compressed air is introduced in the application process.

The "dry" process is sand (the aggregate) and cementitious content that is delivered via an auger mixing method into a gun where compressed air is introduced, blowing the material through the hose to the nozzle where hydration takes place. The nozzlemen controls the addition of water depending on the application needs (Fig. 4).

All the ingredients in the "wet" method (aggregates and cementitious content), including water, are pre-mixed thoroughly and introduced into the delivery equipment. Typically it has been a concrete pump that pushed the mixture through a hose to the nozzle where compressed air is injected, again controlled by the nozzleman as he/she directs the material into place (Fig. 5).

The *placement* process of shotcreting solves a number of construction challenges. First, the manner for excavation of the pool is subject to soil stability. The Prestige Concrete Products crews of Sacramento, CA, where soil conditions are more stable, generally apply shotcrete onto

Fig. 5: Wet-mix concrete delivery truck and pump, Peabody Hotel, Orlando, FL

Fig. 6: Spa construction, Peabody Hotel, Orlando, FL

Fig. 7: Dry-mix process with use of Steel Tex in the foreground. Residential lap pool, West Palm Beach, FL

the pool walls that follow the contour of the earth's excavated shape. In the state of Florida, our crews find that the pool contactors "over"-excavate the shape of the pool because of the sandy soil conditions and, with the use of exterior form boards, Steel Tex (prefabricated sheets of light wire mesh on a backing paper) and reinforcing bar, the contractor can produce almost any pool shape. In either case, both systems of forming are less labor-intensive, use less material, and therefore are more cost-effective (Fig. 6 and 7).

Fig. 8: Dry-mix process used for renovation, adding step and planters

Fig. 9: Dry-mix process used for fountain at a condominium, Ft. Myers, FL

Fig. 10: Residential pool in Granite Bay, CA

The *flexibility* of shotcrete in either process provides limitless use in complex shaping and forming in new construction and renovation projects. Depending on the project constraints, shotcrete is often quicker, less labor-intensive, and therefore less expensive than building with two-sided forms. Shotcreting also works well on several popular design elements, such as vanishing edges and family-friendly beach entries. With the strong relationship between the contractors, material suppliers, equipment suppliers, and the research community, advancements in shotcrete have increased dramatically. ACI Certified Shotcrete Nozzlemen expertly use both methods to safely and efficiently place the materials where traditional concrete placement (form and pour) is either too complicated or too costly (Fig. 8).

The continuing invention of new materials and construction systems have freed up our imagination to create, shape, and mold our environment. Architectural trends and developing construction standards have dictated the appearance of pools (Fig. 9 and 10). And although "Pool is a pool is a pool is a pool," the swimming pool industry has ardently embraced the opportunity to be creative and has "changed this thing, but yet it has still remained—a pool."

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