Natural swimming pools

It's swimming weather alright, but are you happy for your family to swim in chlorinated water? What about the sea? **Michael Littlewood** puts forward the case for natural swimming pools.

Many people can still remember the joy of bathing and swimming in natural waters in the countryside, whether it was a lake river or a pond, in sunshine or moonlight, whatever the weather, with or without clothes, in groups or as a solitary soul, planned or spontaneous. Alas it has all changed and most children today will never ever be able to experience this due to numerous reasons such as health and safety, trespass and land ownership, litigation, polluted waters and many more.

However, not all is lost as there are now natural systems for private and public swimming that can be built for the enjoyment of everyone. Natural swimming pools are based on ponds and pools that were once found so abundantly in the landscape.

The comparison to a landscape pool is deliberate because that is what a natural swimming pool is – a large pond with special provision for people to enjoy the water as well as the various creatures that are attracted to it. Nature offers the best examples.

Most pools, ponds and lakes are cleaned and purified by the combination of plants and micro-organisms including beneficial bacteria. These micro-organisms break down organic wastes into substances which plants can use directly as nutrients.

The pleasure of using natural water once again for bathing and swimming is now available to many people, whether it is in the privacy of their own home or publicly at a hotel, a park, or any recreational centre in the mountains or at the seaside! They are sheer bliss in which to swim and a joy to see.

How it all began

The original concept was developed in Austria by a number of people, who were very conscious of the health benefits of bathing in natural waters found at spas

Natural swimming pools are already widely used right across Europe. They combine the pleasure of our natural surroundings with a safe and chemical-free bathing environment.





and hydro places. It was not until 1985 that the idea was commercially developed by an Austrian based company, called Biotop, by the founder Peter Petrich who conceived the idea of a self cleaning biosystem for swimming ponds.

These have been favoured by many European homeowners and have also become very popular in hotels and resorts. Biotop was followed by Bionova of Germany, who planned and executed the first public pool in 1998, with considerable success. Biotop and Bionova were followed by Bioteich of Switzerland and during this period there were several other companies who undertook the building of natural swimming pools.

More than 1000 pools have now been built in Austria, Germany and Switzerland by many contractors. Each one has something unique to offer with their individual systems but all are variations on the same theme.

As part of my philosophy of ecological design I had for some time been looking for an alternative to chemical swimming pools. A visit to the Biotop company in Vienna early in 2000, where I studied their system, resulted in bringing the concept back to this country. The first natural swimming pool was built in September 2001 for a client of mine near Newent in Gloucestershire.

How they work

Natural swimming pools, are a chemical free combination of swimming area and aquatic plant garden. The swimming area merges with the planted area, creating an environment that is intertwined and mutually dependent on one another. These ecologically balanced, self cleaning swimming pools combine the natural cleaning properties of plants with filtration and skimming systems so that there is no need for harmful chemicals or intensive sand filtration .

The result is a biologically chemical free clean swimming environment. The water is clear but not sterilised, as in the traditional swimming pool, and it is able to sustain the normal range of pond life, microscopic organisms, invertebrates and even frogs and toads. The aquatic flora and fauna are indicators of the state of the environment and at present their loss in the landscape is very worrying.

While designs of the natural swimming pools may vary all consist of a swimming area and a regeneration (plants) zone.

The swimming area can range between 1200 and 2200 mm deep and is kept plant free. It is usually lined with a rubber liner or foil to prevent water leakage and it is separated from the Regeneration zone by a barrier wall. This prevents the invasion of plants and soil leakage from the Regeneration zone into the swimming area and it also makes it much easier to service and drain each separately. The wall top will actually be approximately 100mm below the surface of the pool in order to allow free transfer of water between each area.

Within the Regeneration zone the water is cleansed biologically by the roots of the aquatic plants and micro-organisms. The plants act as living filters and provide a very important function in the whole system by absorbing decomposing materials and bacteria as well as pollutants from the water and converting it into biomass (plant tissue), thereby cleaning water. Water plants rely on these nutrients for their growth.

Zoo plankton is important for the natural swimming pool as they feed on single-celled algae and filter them out of the water. Through this natural self-cleaning process the use of harsh chemicals is unnecessary to keep the pool free from algae and safe. There is very little need for maintenance.

Plants

A range of aquatic plants are used covering submerged (oxygenators), floating, shallow marginals, deep marginals, bog/marsh and waterside species.

Wherever possible indigenous plants are used but a definitive plant list is not always possible as each region should have plants from its own locality if they exist as this will provide for more interest.

All aquatic plants grow far more quickly than soil based species and there is always the necessity of thinning and pruning. However it must also be pointed out that too much heat can also cause considerable stress.





The construction sequence is similar to that of an elaborate garden pond. The important notes to remember are that the swim area walls are kept 100mm below the surface water height to allow water to mix between the swim zone and the plant zones.

Construction

A swimming pool requires a deep area of at least 1500 to 2200 with near vertical walls which needs to be constructed for the swimming area and waterproofed by means of a rubber liner with an under-liner. The swimming area should be a minimum of 25 square metes (50 metres is the minimum for the total area). The internal walls should be constructed from sustainable materials wherever possible such as recycled plastic, stone, timber or geotextile bags. As they will be acting as a retaining structure for the material and plants in the Regeneration zone, they should be carefully engineered. The walls usually have a capping.

The walls should finish 100mm below the water surface to maintain the visual effect of one pool. Ideally the liner should be placed behind the wall (but in some cases it goes over the wall) to ensure that it is both hidden and protected.

The water is drawn down through the substrate in the Regeneration zone and through perforated pipework to the pump. The water is also taken via the surface skimmer to the pump where it is again filtered before returning to the bottom of the Swimming area.

The Regeneration zone must be of the same size as the Swimming area and have an average depth of 300mm of aggregate, usually graded from 50 to 450 approximately.

In some pools the plants would surround the swimming area, giving a soft planted margin to the pool. In small pools it is better to plant on one side only so as to avoid a tight enclosed effect. Where space is at a premium, an alternative is to create a second pool, perhaps uphill to allow the water to flow between the bodies of water, probably using a pump and waterfall.

The Regeneration zone utilises a course inert substrate, such as shingle/gravel and not topsoil or any other growing medium as this would bring high levels of nutrients to the water and would counteract the cleaning effects of the plants, while contributing to the silting process. By planting the aquatic plants in shingle they must draw their nutrients from the water itself and so clean the pool. Also by cutting and removing the plant mass each autumn, the impurities held in the plants are physically removed from the water, allowing the cycle to begin again in the following spring. A surface leaf skimmer is also used to help remove floating debris from the water.

Silt, a combination of decaying vegetation, dust and other detritus will always form in any body of water and depending upon the size and location of the pool it can easily be removed by either a vacuum or bottom purge system.

A drainage ditch is constructed completely around the pool to ensure that no water runoff enters the pool thereby causing any differences in the pH and the water quality.

It has been assumed by many people that the cost of building a natural swimming pool should be considerably cheaper than the conventional ones. Sadly this is not the case due to the many complexities with the biological as well as the construction processes. Currently the average cost is £350/400.00 per square metre with a minimum size of 50 square metres.

Existing swimming pools can easily be converted to the natural process providing that there is space for the Regeneration Zone, either as a separate pool or as a subdivision.

Water quality

The quality of the water is of special significance. The layout of the pool with its natural Regeneration zone promotes the self-cleaning forces of the water and the mechanisms provide a long term stable and hygienic quality. The use of chemicals would only lead to the destruction of the biological balance in the water.

The shallow warmer water of the Regeneration zone circulates with the cooler deeper water of the Swimming area and increases its temperature much more quickly. Solar methods can be used providing care is exercised and it is not used until the plants have grown to combat the algae.

Fish are not allowed in the pool as they cause damage to the water quality and also encourage birds such as herons, who could also damage the liner. Ducks, geese and any other waterfowl, are also discour-

aged and any pets such as dogs.

Wildlife

The natural swimming pool provides an attractive biosphere for various kinds of animals and is quickly inhabited after its creation. They stay mostly in the Regeneration zone that serves them well with food and shelter. There are many predatory insects that feed on mosquito larvae.

Amphibians use the Regeneration zone as a breeding ground too. They appear in early Spring to lay their eggs. The amphibians usually migrate from the pool before the swimming season commences.

Health

Numerous users state that the joy of using water free from chemicals is profound. Chlorine used in conventional pools is a skin irritant and can be associated with rashes like eczema and a number of serious diseases. Chlorine has been documented to aggravate asthma, especially in those children who make frequent use of chlorinated swimming pools. Chlorinated water contains chemical compounds called trihalomethanes which are suspected carcinogens resulting from the combination of chlorine with organic compounds in water. They do not degrade very well and are stored in the fatty tissues of the body.

Conclusion

There is no doubt that our landscape is in severe distress and the loss of wetlands, especially ponds and pools has now reached a critical stage. Natural swimming pools can therefore, make a very important contribution to the restoration of aquatic flora and fauna. We must every effort to design in harmony with nature.

For, as many owners of natural swimming pools comment, it is that harmony, a seamless blending of environments that is the major advantage. Many have also said that it has enriched their lives. While you are separated from the plants you still feel surrounded by them when you swim, which creates a very special kind of mood. The colour of the flowers from spring throughout the summer and into the autumn, along with the chorus of the birds and the frogs make people feel far closer to nature. It provides them with a very special place to be at any time of the day or night, throughout the whole year. It is their very own natural oasis.

All this not only applies to the thousands of private pools that have been built but to the hundreds of public pools in use on the continent for over twenty years. On the continent there is a different attitude to bathing and swimming. The health giving properties of water, sunshine and gentle breezes on the body are widely acknowledged both by the public and the governments.

With the many changes forecast in our climate that public pools will be possible in the United Kingdom but it could well be that indoor pools using plants from tropical countries may need to be the starting point or a combination of both. I long for the day when we, the public, will be provided with the choice of swimming in water of our choosing - natural or chemical.

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There are now a small number of dedicated natural swimming pool builders in the UK.
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Natural pools can be constructed near to the home just like normal swimming pools. They can even be inside/outside with the swimming part of the pool inside a suitable building and the plant zone outside.