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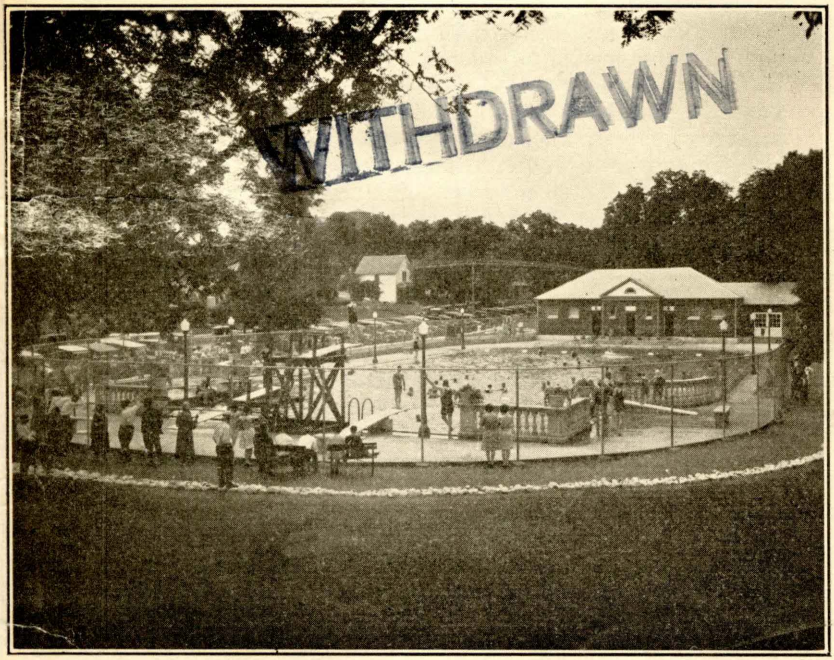
Planning the Outdoor Swimming Pool

LINDON J. MURPHY



Bulletin 108
Engineering Extension Service
Iowa State College Ames, Iowa

IOWA boys and girls, young and old, like to swim. Communities all over the state are beginning to appreciate the healthful recreation which an outdoor pool affords. They are realizing too that it may be cheaper to pay taxes for municipal recreation than to buy commercial recreation. Greater demands are being made each year that the community supply these recreational advantages, particularly for all of the children.

Many a civic leader is fully appreciative of what a pool may mean to his community without knowing how to translate this vision into practical reality. It is the purpose of this bulletin to give simply and understandably the information which such a leader should have in order to intelligently plan and carry out a community swimming pool project.

The design and construction of a swimming pool are really complex engineering problems. A cheap pool may in the end prove very expensive. A poorly designed pool may even be hazardous to the life and limb of an unwary bather. Improper sanitary facilities may endanger the health of patrons, causing skin infections or even disease epidemics. The value and popularity of a pool may be quickly destroyed by any one of these conditions. Hence it is the part of wisdom for every community undertaking such a project to secure technical guidance and assistance, such as that which can be given by a competent sanitary engineer, in designing and constructing the pool, bath house and purification equipment.

While the material in this bulletin has been presented largely for the use of civic leaders who are sponsoring swimming pool projects, a number of guiding standards have been included which will be of interest and value to the designing engineer. Frequent reference has been made to the reports of the Joint Committee on Bathing Places of the American Public Health Association and Conference of State Sanitary Engineers, and to the very comprehensive pamphlet written by Mr. Stanley Pinel for this department in 1924. Credit is also due to the many authorities whose writings make up the public store of knowledge in this field.

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Planning the Outdoor Swimming Pool

LINDON J. MURPHY

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Iowa State College

For a good many people swimming is one of the most enjoyable of recreations. The old swimming hole was the source of many pleasant hours for the boys of yesteryear. But the old swimming hole has gone; the sparkling stream, on which the rendezvous was located, has become a sluggish, ill-smelling sewer, and the boys of today must look elsewhere for a cooling plunge.

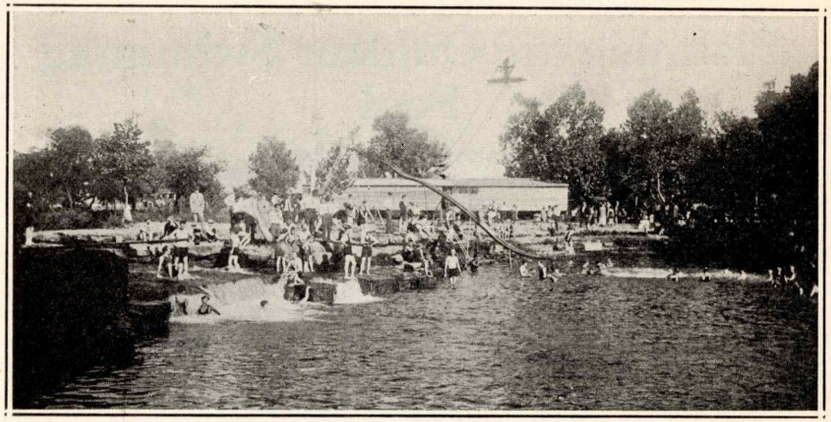
It is to meet this need that towns and cities have awakened to their responsibility in providing swimming pools where boys and girls from 6 to 60 may enjoy healthful, invigorating recreation.

The lure of the green depths of the old swimming hole has been supplanted by the even greater attractiveness of the modern pool. Instead of the water hole with its green scum, its muddy bottom with perhaps a snag or boulder here and there, has come the modern pool, in a natural park setting with clear, pure water, and a smooth bottom, free from hazardous obstacles or dangerous stepoffs. The slippery rocks on the bank and the overhanging tree limb from which an adventurous spirit might go "kerplunk" into the water below, have given way to the slides and diving devices of the modern pool.

Safer? Yes! Healthier? Yes! And as much fun. With our new pools, close in, attractive, and available for all, swimming is becoming more and more popular each year. We are recognizing it as one of the most healthful forms of exercise, as well as one of the most enjoyable of recreations.

In providing swimming pool facilities for its citizens the municipality also assumes some definite responsibilities. A swimming pool is not just a tank of water. To care for the small youngsters, and the non-swimmer as well as the swimmer the pool must have certain dimensions and depths. To be healthful, even safe, the design of the pool must provide for maintaining a definite standard of water purity. To be convenient and hygienic certain rules must be followed in erecting and operating the bath house.

Where should the pool be located? What should be its size and proportions? What purification is necessary for the pool water? How large should the bath house be? What will a swimming pool project cost, and how can the money be raised? It is the purpose of this bulletin to answer these and similar questions which confront every group seeking to promote a community pool—questions whose satisfactory solution mean the success or failure of this project which can contribute so much to the community enjoyment and welfare.



Outdoor pool formed by impounding a suitable stream.

Types of Pools

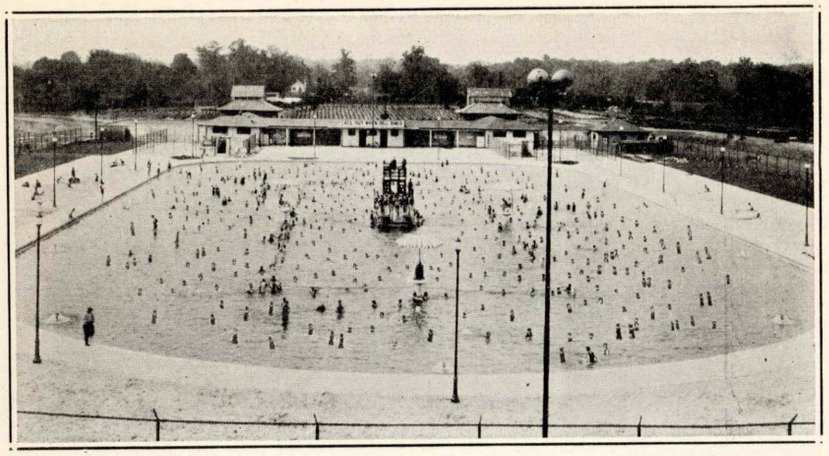
Having decided that a community swimming pool is desirable the first step will be to examine carefully the natural facilities. Fortunate is the community which has within its confines a lake or river offering water acceptable for bathing. Iowa communities having such an unspoiled natural resource can be counted on the fingers of one hand; they happen to be all located on our larger lakes. As the streams and rivers of Iowa are all grossly polluted they must be thrown out of consideration for use as impounded pools—for swimming pool water must be pure and free from disease producing pollution; it must be drinking water. Hence the artificially constructed pool remains the only recourse for the large majority of Iowa communities.

Selection of Pool Site

Where then should we locate our community pool? What are the things which we should consider in deciding upon the pool site?

The location of an outdoor swimming pool should be determined by (1) natural available sites and (2) general accessibility. Often a park owned by the city may offer a splendid natural setting. A drain or ravine may lend itself to the construction of a pool without the necessity for moving any large volume of earth. Certainly the pool should be easily accessible to the people who are expected to use it. Many pools have served but a small measure of their full usefulness because they have been set in unattractive surroundings or in remote locations. Too much emphasis cannot be placed on the fact that the pool should be as centrally located as available space, real estate values, and parking area will permit.

An ample supply of water is also a factor which may influence the selection of a pool site. A well or large public main close at hand are



Large outdoor pool with shallow water at edge and deep water in center.

very desirable. A sewer and drainage facilities are also necessary and must be considered in comparing possible pool sites.

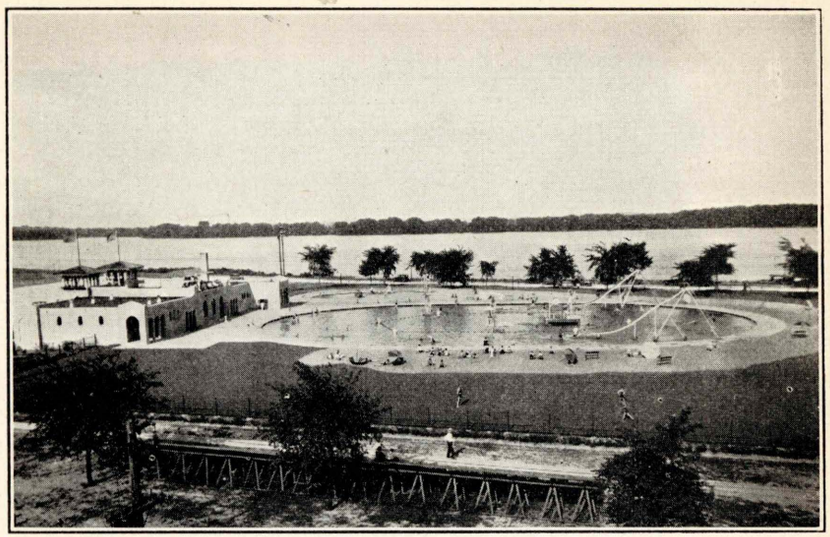
Size of the Pool

Having decided upon the erection of a swimming pool and having selected the most advantageous site, the next important step is to determine the size and shape of the pool. This is a matter which will warrant considerable study.

Factors which should govern the size of the pool are the needs of the community, building funds available, and the capacity of the site selected. It is very difficult to estimate the swimming load which can be expected. Certainly the pool should accomodate the large crowds which will attend on holidays and special occasions, yet it should not be so large as to be wasteful of construction funds or water. A pool which appears to be full much of the time will be more attractive to the public than one so large that it may look nearly deserted. The experience of other similar communities with swimming pool projects will be a helpful gage on the desirable size of the pool. Even with such information local conditions will have tremendous influence on the size needed.

From observation certain arbitrary standards have been worked out to aid in estimating the size of a pool. These are based upon the area needed for each swimmer and wader, and upon the volume of water recommended for each person by sanitary authorities. With an intelligent estimate of the number of bathers who may be expected at the time of maximum use and the above requirements per bather the size of the pool can be computed roughly.

A study covering a number of swimming pools indicates that about 80% of the bathers can generally be found in the area four and a half



Courtesy Clinton Chamber of Commerce and Beil Studio

Clinton swimming pool and play ground. Pool has shallow beach edge with deep section and diving platform in center. Attractive and substantial bath house with complete purification equipment.

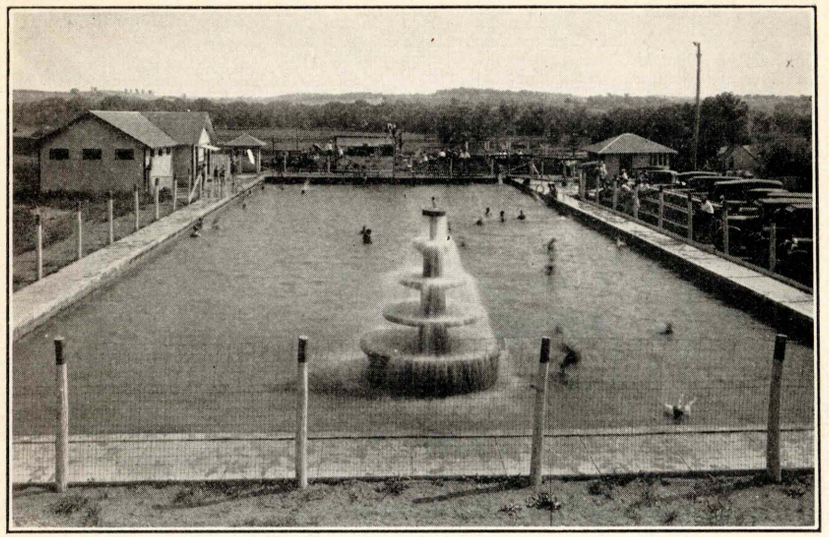
feet deep or less. Managers of public pools recommend that at least 75% of the area be made shallow enough for wading (four and a half feet deep or less) and the rest vary from four and a half to nine feet for swimming and diving.

Swimmers have been found to occupy from 20 to 50 square feet of area each. The Joint Committee of the American Public Health Association and the Conference of State Sanitary Engineers has recommended that an average of 27 square feet should be provided for each swimmer who may be expected to be present at the time of maximum load. Non-swimmers require much less area due to their lesser activity. An area of from 10 to 20 square feet per bather should be provided in this portion of the pool.

Several state boards of health also require that there be at least 800 gallons of water for each person using the pool at one time. In a pool designed as indicated above there would be considerable excess over this amount. It is evident that a pool designed for a large proportion of swimmers would be relatively deep, hence it would contain a large volume of water per swimmer. Likewise a pool designed with a large wading area, being relatively shallow, would have a low water content.

It is also apparent from a study of many pools that the size of the city or district in which the pool is located, has an influence on the attendance at the pool. The smaller the community the larger the proportionate attendance at the pool. Pinel* has stated that for cities

*Outdoor Swimming Pools by Stanley Pinel, Bulletin No. 61 Engineering Extension Department, Iowa State College, Ames, Iowa, Jan. 23, 1924.



Courtesy Portland Cement Association

Denison swimming pool and frame bath house. The fountain shown in the foreground is favored by many as an attractive way of introducing fresh or purified water.

under 30,000 inhabitants the maximum daily attendance has been found to be from 1/11 to 1/18 of the total population. The average is about 1/14. The maximum number of bathers that use the pool at any one time seems to average about 1/5 of the maximum daily attendance.

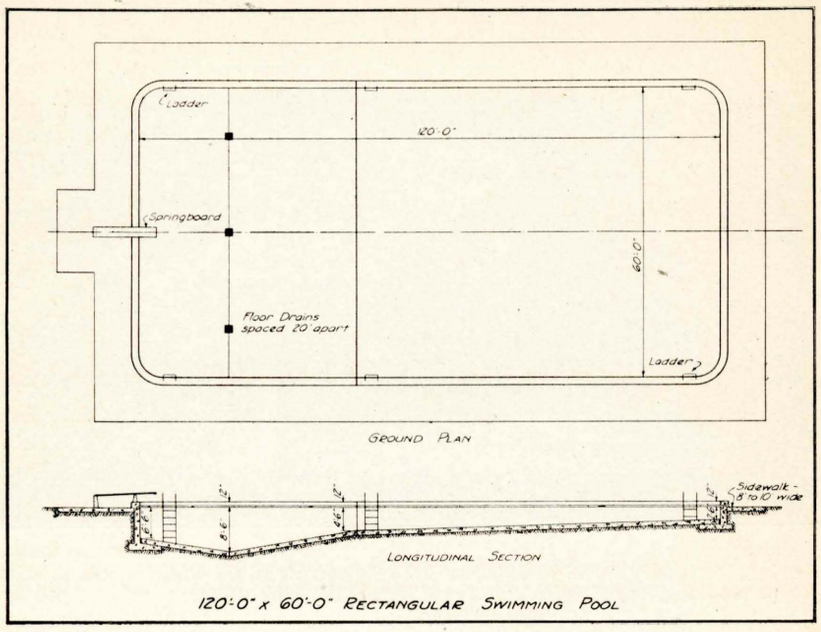
Shape of the Pool

What should be the shape of the pool? To correctly answer this question we will want to consider several factors which influence the shape and type of the pool. The most important of these are size and local conditions.

Where only a small pool is desired the rectangular form has several advantages. It supplies the proportionate area of deep and shallow water needed without the hazards of steep side slopes and sudden step-offs. A rectangular pool is also somewhat easier to design and construct.

Many communities however will want somewhat larger pools where it is possible to introduce some individuality into the design with increased attractiveness and usefulness. Inasmuch as the most popular pools are those which accomodate all classes of people from small children to expert swimmers the saucer type of pool has come into favor. These structures simulate natural beach conditions providing very shallow water at the outside and deep water in the center.

The needs of the large majority who do not swim are thus more adequately taken care of than in the rectangular pool and in addition



120'-0" x 60'-0" RECTANGULAR SWIMMING POOL

an open space is left in the center for swimmers where they will be unhampered by non-swimmers. Such a pool is certainly much safer, in that no one can fall into deep water from the shore.

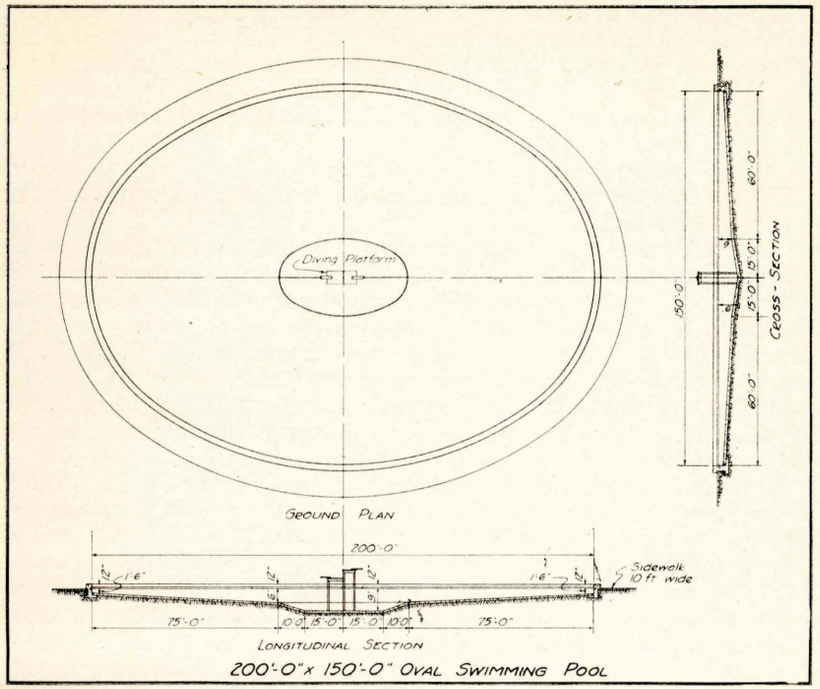
The saucer type of pool lends itself admirably to an attractive blending with the topography. A circular, oval or irregularly curved pool may be designed which will have the appearance of a small lake.

Other special conditions may also influence the shape of the pool. A straightaway of a certain length may be desired for swimming races, or it may be advisable to design the pool so that it may be used for skating in the winter. The saucer-type pool can be used very satisfactorily for this latter purpose. When the water is allowed to freeze it will expand, and the ice will slip along the sloping bottom without harming the structure.

General Pool Design

The rectangular pool is of comparatively simple design. The shallow part is usually at one end and the deep section at the other. Depths commonly vary from 2 or 3 feet at the shallow end to 8 or 10 feet at the diving platform. The plan shown on this page is typical of this class of pools.

Many of the recently constructed pools have been circular, oval, or irregular in shape. These pools have the shallow water around the outside and gradually deepen toward the center where the diving



200'-0" x 150'-0" OVAL SWIMMING POOL

piers may be located. Such pools commonly vary in depth from 0 to 3 feet on the outside to 8 or 10 feet in the deep section.

An infinite number of variations from these two standard types are of course possible and even advisable in many cases to meet special community requirements and peculiar topographic conditions. It is important however not to lose sight of the fact that from 70 to 80 percent of the bathers do not swim, and that a proportionately large area of the pool from 3 to 5 feet in depth should be provided.

BOTTOM SLOPES. The bottom slopes of a pool should be designed to meet two conditions. The first and most important is that they give safety to the bathers while at the same time providing the desired change in depth. To this end it is recommended that the pool bottom be sloped gently from the shallowest point to the center or deep section with no slope greater than 1 foot in 15. Step-offs are very dangerous and should not be permitted under any conditions in water less than 6 feet in depth.

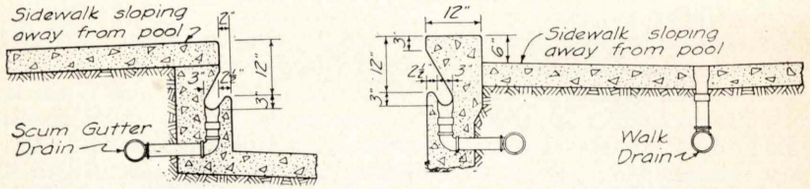
In the past many of the smaller pools have secured the variation in depth of water at the expense of the safety of the bather. Often the floor has been constructed so steep that the bather found it very difficult to maintain his footing. As a result in trying to keep his balance he might very easily be forced into water beyond his depth.

The second consideration of importance in designing pool bottoms is that they drain readily and completely. Usually only one floor drain is provided, hence the entire bottom must slope toward this drain. A minimum slope of ¼ inch to the foot is desirable to insure good drainage and prevent small pools of water from remaining due to irregularities of the surface.

Side Walls. Because of the fact that sloping sides are dangerous and hard to keep clean, it has become the practice to make all side and end walls vertical.

Scum Gutters. A design feature of tremendous importance to the proper sanitation of the pool is that of scum gutters. While there are several uses for such a device its main purpose is to carry off the water skimmed or splashed from the pool and to act as an expectoration trough. Foreign substances floating on the surface such as hair, dust, pieces of skin, and sputum are among the most prolific sources of pollution. To prevent the accumulation of such contamination it it should be frequently flushed into the scum gutters by splashing or by intentional overflow of pool water.

Scum gutters should extend entirely around the pool. They should be so designed that material washed into them will not easily be washed back into the pool. The gutter should be designed to serve as a handhold to swimmers and yet of a shape which will not catch and hold the arms or feet of bathers. It should also be deep enough and have sufficient drains so that the bathers hands or elbows will not come in contact with the wash water in the gutter.



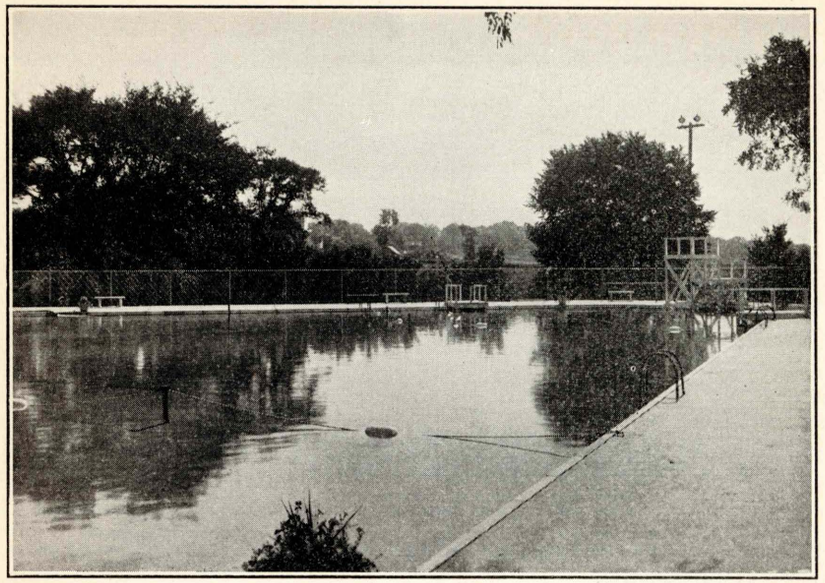
Recommended scum gutter design. Typical pool wall and walkway sections also shown.

This design eliminates the old dangerous pipe rails and ropes which were formerly used as safety aids. Any obstruction such as projecting piping has been found to be a frequent source of injury to bathers.

Properly designed scum gutters serve so well the double purpose of providing an easy handhold for tired swimmers and of carrying off the washings from the surface of the pool, that they should be considered an essential feature of the swimming pool design.

Pool Construction

In addition to being well designed, a swimming pool project demands careful attention to its construction. The continued attractiveness of the pool, its water-tightness, durability, and the ease with which it can



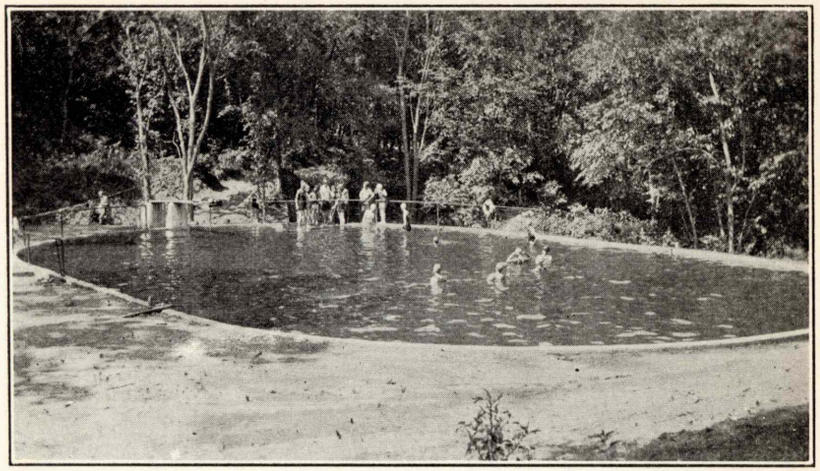
Swimming pool at Marion, Iowa. Diving platforms and safety buoys shown in background. Notice high, fine woven fence around pool enclosure and concrete walkway from pool edge to fence.

be kept clean and sanitary are all dependent upon intelligent construction. Built right the pool should be impervious and durable; it should be easy to keep clean; and the maintenance and depreciation should be negligible.

For ideal construction conditions the pool should be located where the soil is dry and naturally well drained. As these conditions are but seldom found in practice they must be simulated artificially. Sub-drainage is usually necessary, particularly where part of the pool may be below the ground water level. Six-inch open-jointed drain tile are laid around and under the pool to carry off the ground water which might otherwise cause trouble.

Such provision for drainage will insure dry working conditions for placing concrete, and later relief from excessive stresses on the walls of the pool which occur with high ground water and the pool empty. Sub-drainage will also minimize the harmful effect of freezing and expansion of the ground adjacent to the pool walls during the winter months.

How Can A Durable, Watertight Pool Be Secured? An outdoor swimming pool must be constructed of material which will be water-tight, weather-resistant, and light in color. It should be as inexpensive as is consistent with attractiveness and sanitation. Rein-



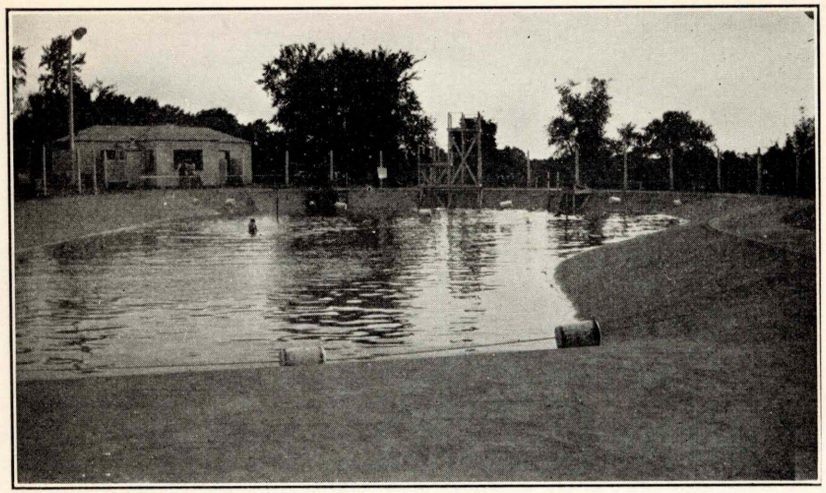
Girl Scout pool at Stone Park, Sioux City.

forced concrete is perhaps the only material which completely satisfies these requirements.

It is possible to secure concrete of definite quality and desired water-tightness. Studies show that the strength, durability, and impermeability of concrete are determined by the proportion of water to cement in the mix. True, the ingredients must be first class,—approved portland cement and clean, sound aggregate; the quality of the water-and-cement paste, however, and not the proportion of sand or stone, determine the quality of the concrete.

For an outdoor pool a paste made up of 5½ gallons of water to each sack of cement is recommended. To this paste should be added sand and gravel or stone until the desired consistency of concrete is obtained. For the first batch trial proportions of two parts sand and three parts by loose volume gravel or stone are suggested (1-2-3 mix). If this mix is too wet, more aggregate may be added; if too stiff less aggregate can be placed in the next mix. It may be necessary to change the proportions of sand to coarse aggregate in order to obtain a dense, plastic and workable mix. The amount of water per sack of cement must not be changed, however, under any conditions, for as mentioned previously the quality of this paste determines directly the strength and other desirable qualities of the concrete. The 5½ gallons of water is composed of the sum of the water added to the mix and that already present as moisture in the sand. Most sand will contain under the condition stated above about ¾ gallon of water; in which case 4¾ gallons should be added for each sack of cement used.

It is of the utmost importance that the concrete be water-tight. For a plastic mix this factor is assured by selecting the 5½ gallon paste. The sand and coarse aggregate available should be proportioned so



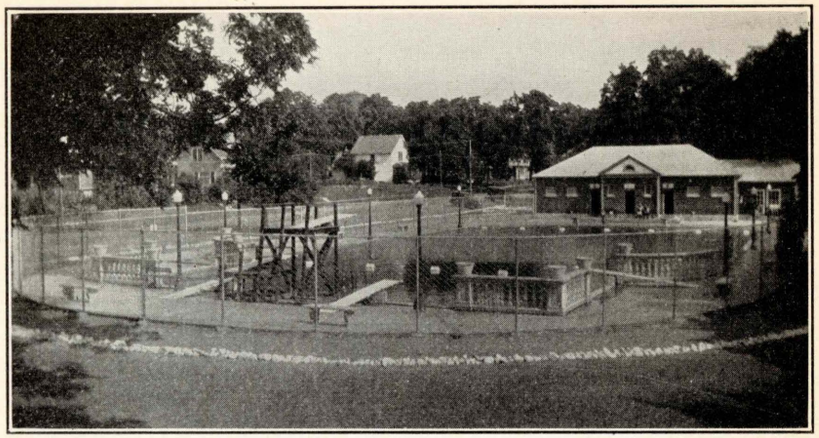
Swimming pool with dangerously steep side slopes, and walkway which must also serve as scum gutter. The water level should be maintained at height of scum gutter for proper sanitation.

that the best plasticity is secured. The proportions of aggregates should be kept fairly low—a plastic workable mix which can be placed and worked easily in the thin wall sections is desired, rather than the stiff but more economical mix which would result from crowding all of the sand and stone possible into the paste.

The difference between an attractive pool of dense, durable, water-tight concrete and one lacking these qualities is so great, and so apparent to even the casual observer after a few seasons of freezing and thawing, that careful selection of the builder is warranted. To place the construction in the hands of an experienced and conscientious concrete contractor is to assure a pool which is economical in first cost and low in overhead.

ADMIXTURES. The advisability of using admixtures to make concrete water-tight is often raised by those building pools. With the use of an arbitrary mix (1:2:4 for example) which is almost universally undersanded, and an excess of water, there is no doubt that admixtures, fillers, water-proofers, and seal coats of various descriptions help to make impervious concrete from mixes which were otherwise defective and leaky.

When a mix has been stated such as 1:2:4 and the builder has not been allowed to change these proportions when they were obviously harsh and unworkable, admixtures have been valuable in making the mix more plastic; however when only the "paste" is specified and the aggregate may be used in any manner to secure plasticity few cases arise where such admixtures are necessary. It is worthy of note that some sands have been stripped of fine material (passing 100-mesh



Courtesy Estherville Chamber of Commerce

The Estherville swimming pool and bath house. Note the spring board and diving platform arrangement at the deep end of the pool, also the wide concrete walkways extending from the pool walls to the high closely woven fence. Concrete benches are provided for the comfort of bathers.

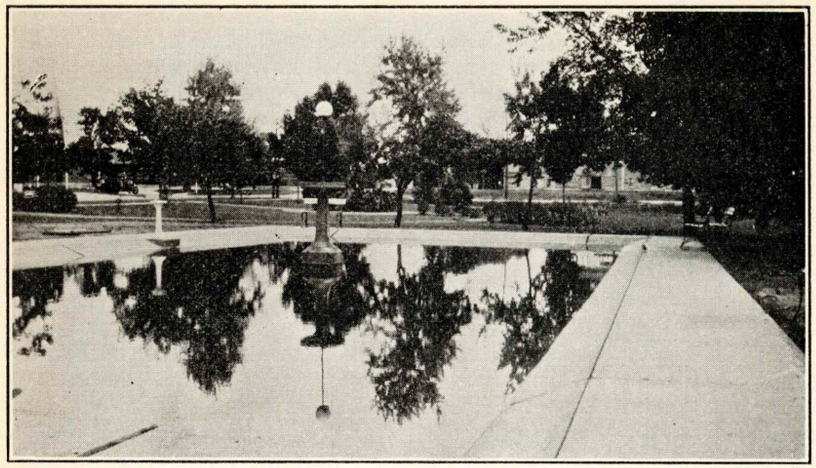
screen) in the washing process. Admixtures, in supplying this fine inert material, have naturally made the mix more workable and watertight. It is evident that the same results can be secured more economically by securing sand which still contains this very small percentage (1 to 3%) of fines, or by adding slightly more cement.

Finishing & Curing. Finishing and curing are of tremendous importance in securing maximum durability and water-tightness of concrete. Finishing should consist merely of that troweling or working which is necessary to secure uniformity and a smooth, even surface. Excessive troweling will bring the cement and water to the surface, resulting in a thin layer of laitance which will check with changes in temperature, eventually scaling and weathering badly. If desired the inner surfaces of the pool walls may be rubbed smooth with a carborundum brick immediately after the forms have been removed. The top of the walls and walkways should be left gritty to prevent slipping.

While concrete attains some measure of strength even in 24 hours, it should continue to improve in quality for a considerable length of time if kept wet; hence, to secure maximum durability and water-tightness of the concrete, careful attention should be given to curing. Newly placed concrete should be kept moist by wetting and protected from the sun and from drying winds for ten days. This is imperative if water tightness is to be secured.

Briefly, for securing water tight concrete these three factors should be carefully observed:

1. Use of a dense paste of water and cement.

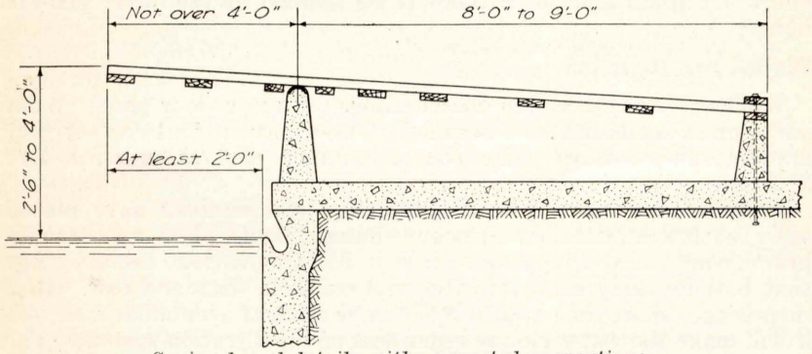


Algona Park pool. Ornamental but sides too steep for a safe wading pool.

2. Use of a mix which is workable, not "wet" nor harsh but plastic so that all parts of forms are filled easily.
3. Do not allow concrete to dry out for at least ten days; start curing as soon as it has set.

Special Equipment

People come to a swimming pool to play. The diving boards, platforms and play devices are therefore an important part of the pool facilities. Diving boards constructed in accordance with standard specifications are among the pools' strongest attractions. Many people prefer diving even to swimming. For this reason diving platforms may also be desirable. While they add to the hazard of diving they also add to the thrill, and are very popular with the better divers.



Spring board details with suggested proportions.

Diving towers must be rigidly constructed and securely anchored with sufficient bracing to insure stability under the heaviest loads. Ten feet above the water level is the maximum height at which diving boards or platforms may be safely placed. All spring boards and diving platforms should be covered with cocoa-fibre matting to prevent slipping.

Steps have been found to be a frequent cause of injury in a pool, hence they are rapidly being superceded by ladders and step holes. The design of either steps or ladders should be such that the danger of accidents is minimized. The facility with which step holes may be cleaned will be an important consideration in their design. Hand rails, leading out over the pool wall, will be needed with either ladders, steps, or step holes.

On rectangular pools ladders should be located at one or both sides of the deep end. Where the distance from the bottom of the pool to the top of the wall is over 2 feet at the shallow end a ladder should be provided there also.

Many new pieces of equipment such as slides and rotary floats have been devised. When properly constructed they are quite safe and certainly heighten the play spirit. They require, however, a considerable space hence are impractical for small pools. Inflated rubber fish, horses, and marine monsters are inexpensive and add to the popularity of the pool.

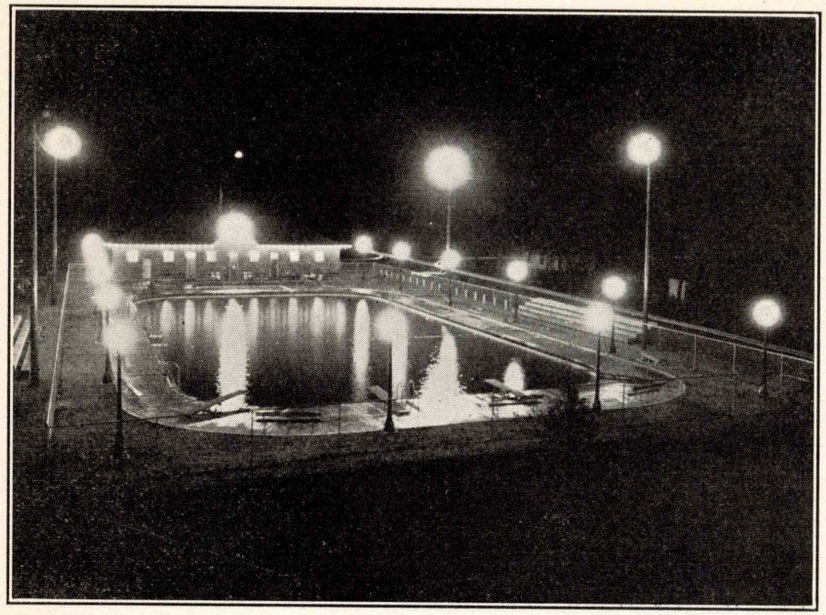
Lighting

Good lighting adds very materially to the attractiveness of the pool, and increases the hours of usefulness. During the hot summer months the evening period between 7 and 10 is frequently the most popular of the whole day. Considerable study and expense is therefore warranted in securing effective lighting both at the pool and in the bath house. Various systems of flood lighting are used at the larger pools where the number of incandescent globes would be excessive. Whatever the system of lighting it should enable the life guards to see clearly all parts of the pool, including the floats, springboards, towers, and other appurtenances without being blinded by the direct glare of light.

Walks and Beaches

Just what are the proper surroundings for an outdoor pool? What about grass lawns and sand beaches? These questions arise in the very laudable endeavor to make the community pool as practical and attractive as possible.

In simulating natural conditions many communities have placed sand beaches around their outdoor swimming pools. The sand beach is heartily approved by patrons altho it has the distinct disadvantage that bathers carry sand into the pool on their suits and feet. In a surprisingly short time a sufficiently large amount accumulates so that it will make the water cloudy regardless of the filtration system. The



Courtesy Portland Cement Association

The Webster City pool at night showing the effective flood lighting.

sand clogs the drainage system and its removal is the source of considerable expense in the course of a season.

A grass lawn around the pool also meets with the approval of the patron, and combined with shrubbery it assuredly does give the pool an attractiveness which cannot be secured in any other way. It has certain disadvantages however which must be considered. Frequent attention is necessary to keep the lawn presentable. It wears out under the use of bathers, and must be kept mowed. The newly mown grass is easily carried or blown into the pool where it gives the water an uninviting appearance.

After experimenting with both the grass lawn and the sand beach, many pool managers have come to prefer a concrete pavement around the pool. Certainly a concrete walkway at least four feet wide is essential around the pool. The walkway should be smooth and easily cleaned, tho with a surface finish which will not be slippery. It is desirable to have the walkway slope away from the pool at a pitch of ¼ inch to the foot for easy drainage. The wall of the pool should extend at least 6 inches above the walkway and should be not less than 1 foot wide. An edge of this size will protect against accidental tripping, and will also form a barrier between the pool and walkway which permits the use of hose pressure for washing.

Without doubt a concrete runway around the pool is more sanitary, and in the long run more satisfactory to all concerned. The area may

Small wading pool adjacent to the swimming pool at Webster City.

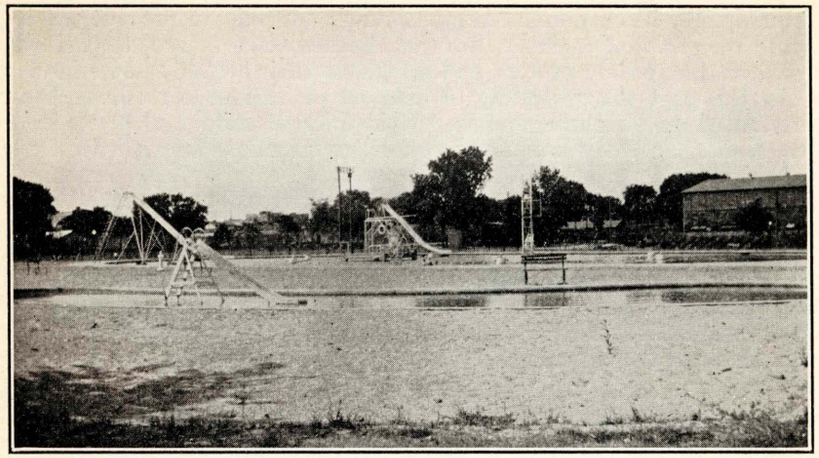
be widened sufficiently so the bathers may rest and sun themselves. Benches placed around the enclosure will add to the comfort of the bathers.

The pool area should be completely enclosed to keep spectators out and bathers in. A person coming in from outside the pool runways will track in dirt and materially add to the contamination of the pool. Many of the older pools were enclosed by the tight walls which entirely shut off the pool from the outside giving the whole a cold, prison-like atmosphere. There are several tightly woven, high wire fences on the market which are much more satisfactory. These fences are serviceable and durable, yet allow the spectators to see the pool without difficulty. With such a fence placed at the outer edge of the pool walkway, the surrounding area may be landscaped, using lawn, shrubbery and trees to give the pool and bath house an attractive setting.

Wading Pools

Wading pools are becoming increasingly popular in conjunction with community swimming pool projects. They permit very small youngsters to enjoy the same healthful play as their elders without the limitations and hazards which they would encounter in a pool designed for older folk.

To provide for the little folks in an outdoor swimming pool a considerable area of very shallow water is required. This area should really extend all around the pool so no child may fall into deep water. The bottom must necessarily slope very gradually from shallow to deeper water. Even then there is always the possibility that a small child will venture too far into deep water. It is evident that a separate wading pool for youngsters is desirable for several reasons. It is safer. And in many cases it is cheaper. A real economy is made possible in the swimming pool, in that the minimum depth can be set at 2½ feet



Small irregularly curved wading pool at the Clinton Park pool. Adapted with its shallow water, sand beach and low slide for the very small children.

instead of 12 inches as would be needed for small children. The same effective bathing area can thus be secured in a much smaller pool than would be possible where an extremely shallow wading section is included. A small separate wading pool proves quite a drawing card, where little folk may play and sail toy boats undisturbed, while their elders enjoy the larger, deeper swimming pool.

Wading pools may be almost any shape or size. They are frequently oval or round, with dimensions from 20 feet to 50 feet or over. The depth is usually about 12 inches with shallower water at the edges. Sides may be vertical or gently sloping as on a beach. A wide concrete walkway about the pool is desirable.

The water supply for a wading pool may be identical with that for the larger outdoor pools. As the quantity of water required is small, and a considerable amount of debris, sand and grass gets into the water, it is usual to follow the "fill and draw" plan. If a high degree of bacterial purity is desired a continuous flow of water may be maintained thru the pool, or it may be emptied, cleaned and refilled every day.

SWIMMING POOL SANITATION

How can a swimming pool be made a safe and healthful place for recreation? What are the health hazards and what safe-guards can and should be taken to protect the health of children and adults who use the pool?

These are questions which an enlightened public is asking and which must be answered satisfactorily before a community is justified in going ahead with a swimming pool project. A swimming pool can no longer be considered just a tank of water. We now recognize that the

municipality has a definite responsibility, not only to provide wholesome recreational facilities for the children, but to see that these facilities adequately protect and safeguard their health and welfare.

In the past the spreading of diseases of various sorts have been attributed to swimming pools. Epidemics of mild and acute conjunctivitis, auditory canal and other ear infections, sinus infections, tonsilitis, various types of skin diseases, and even typhoid fever epidemics have been found to be transmitted by either swimming pool water or suits, or towels.

There is, therefore, ample reason for insisting on protective measures to safeguard the health of those who use the pool. As it is practically impossible for anyone to swim and dive without swallowing some water, it naturally follows that swimming pool water must be fit to drink. It must meet the standards of quality which have been set for drinking water.

Maintaining Pure Water

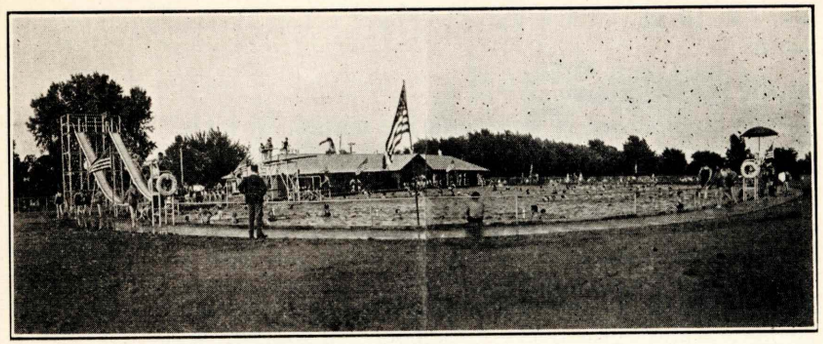
How can water of a sufficiently high quality to safeguard health be maintained? First, there must be a relatively large supply of pure water available for pool use. This may be a well or spring near the pool site, tho most frequently the municipal water system will be relied upon for the pool supply.

Water from wells and the city mains is usually of a quality which may be used directly without filtration or treatment. Spring water should be carefully analyzed before it is seriously considered, and streams may be looked upon with even graver suspicion. In fact, it is very doubtful if a single stream can be found in Iowa whose water may be safely used for swimming pool purposes without treatment. If a stream is seriously polluted it should be immediately dropped from consideration as a source of pool water. City water is a particularly desirable source if it can be utilized at a reasonable cost, because it is ordinarily of excellent quality and can be used without additional pumping. Water for filling the pool can be drawn during the night when domestic consumption is lowest.

Provision is necessary in the design of a pool for complete circulation of water thru all parts of the pool during the bathing period. Without such circulation it is almost impossible to maintain good sanitary conditions at all times, even tho the pool be frequently emptied, cleaned and refilled. For this reason the fill-and-draw method cannot be considered as satisfactory.

Fill-and-Draw Method

In this method the pool is completely filled with fresh, clean water which is used until its quality is no longer suitable for bathing. The pool is then emptied, cleaned, and refilled with fresh water. So much time is lost in draining and refilling, and the total volume of water required to maintain even reasonably sanitary conditions is so great that this method does not make for a very profitable investment. The



Municipal swimming pool at Ottumwa, Iowa.

requirements of the State Department of Health are constantly becoming more strict concerning these pools. The present recommendation of the Joint Committee on Bathing Places of the American Public Health Association and Conference of State Sanitary Engineers is that "the total number of bathers using a swimming pool during any period of time shall not exceed 20 persons for each 1000 gallons of clean water." With a pool 45 feet by 105 feet which may contain about 270,000 gallons of water, this means that 270 people can use the pool before it would have to be refilled. Many pools of this size, however, have several times this number of patrons on a hot day. As a result the pool would have to be emptied in mid-day when the patronage is greatest. And it takes from 8 to 48 hours to refill the average pool. Several reasons are therefore evident why the fill-and-draw method is giving way to the continuous flow plan.

Continuous Flow Method

This method provides for the continuous introduction of pure water at a uniform rate during the time when the pool is being used. A similar amount of water is drawn or pumped out at a point distant from the inlets, so that the oldest water may be drawn out first. The used water in the pool is thus continually being diluted with fresh pure water, the rate being sufficient to maintain the desired standard of water purity. The clean water introduced may be either fresh water from a well or city main, or pool water which has been purified. Either source will give good results, hence a comparison of the relative costs of the two methods should be made. In some localities water may be cheap enough to justify its use in preference to refiltration. In many other communities, however, filtration and recirculation will be found the most economical. In making a comparison of the two methods the temperature of the water must be considered. Pool water must be kept warm enough to permit comfortable bathing. Where fresh cold water is to be used this will mean heating to a temperature of about 72°F before the water is introduced into the pool. With either method

from 5 to 10 percent new water will have to be added daily to make up losses.

Water Purification

With the first cost of water growing continually higher, and the cost of purification equipment becoming relatively lower, recirculation and purification will merit more and more favorable consideration. For swimming pool projects in which this method has been decided upon, several questions are pertinent. What units are necessary in a purification and recirculation system? And how may they best be selected?

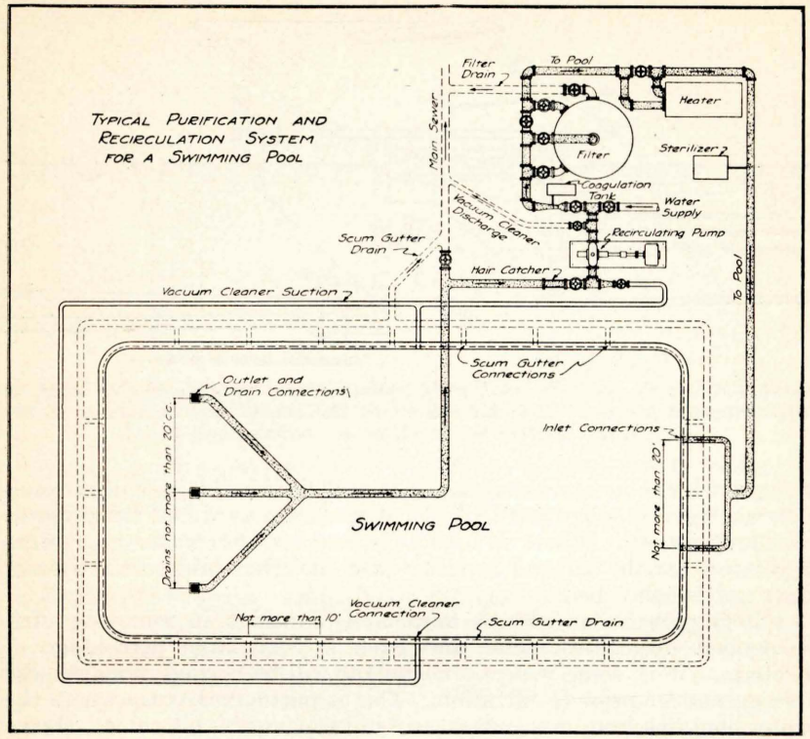
A pool purification system usually consists of pumps, filters, disinfecting devices, heaters, haircatchers, and the necessary piping from the outlets and to the inlets of the pool. In addition, a suction cleaner is usually connected with the recirculation piping. The system and all of its component parts should be designed to supply the volume of purified water which may be needed by the pool with a minimum of frictional resistance. This means that equipment such as the pumps and filters must have a capacity such that even under the most adverse conditions the water in the pool will have a turnover ratio of at least two, and where heavy bathing loads are anticipated, the turnover ratio should be three or more. The equipment should be housed in a suitable structure, such as a wing of the bath house, where easy access may be had for inspection and operation. It should be operated by a competent attendant who is thoroughly familiar with the equipment, and who understands in a general way the principles of water purification.

Pumps. A pump is an essential in a pool recirculation system. What type of pump, then, will give best results, and how should it be driven?

Centrifugal pumps are given preference for use on swimming pool circulation systems, altho some plunger pumps are in use. The type of filter will influence the selection of pumps, in that where pressure filters are used the pumps must be designed to deliver the required volume of water under the maximum head which will develop in the filters. Where a suction cleaner is connected to the pump suction, a pump must be selected which will develop a strong vacuum. With multiple filter units it is advisable to have pumps in duplicate with cross connections to permit washing of one filter with the effluent of another. Where filters are located at an elevation higher than the water line of the pool it is necessary to place a check valve on the pump suction.

Electric drive for swimming pool pumps is preferable.

Filtration. To be inviting, pool water must be clear, sparkling, and free from sediment. Sand filters have the remarkable property of imparting these qualities to water passed thru them. Filtration catches all of the floating impurities, greatly lowers the turbidity by retaining much of the fine suspended matter and reduces very materially the danger from waterborne infections. Water is returned to the pool after



filtration and final sterilization in a state of clearness and purity often superior to the quality of the raw water supply. Thus filtration can largely be credited with making it possible to "swim in drinking water."

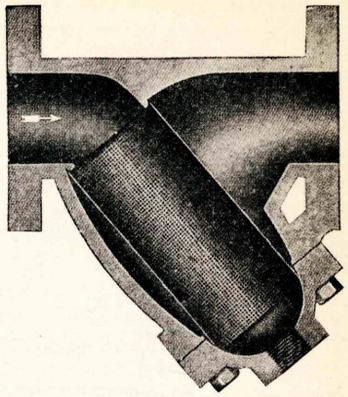
It is hardly necessary to go into the details of filter design here. It is enough to mention that they should be able to handle on days of heavy bathing load three or more times the total volume of water in the pool. This means that at such times the filters and recirculation system must be operated 24 hours a day and on the basis of 100% efficiency. If the filters are allowed to become only 50% efficient or are operated only half of the time it is evident that the result would be the same as if the system were only half as large. A maximum permissable rate of 3 gallons per square foot of sand surface per minute has been set by sanitary authorities.

Batteries of two or more filters are preferable to one large unit, as they permit of continuous filtration even tho one filter may be out of operation for cleaning or repairs.

Pressure filters should be equipped with gauges to show the pressures on the inlet and outlet of each filter so the loss of head can be determined. Open gravity filters should be equipped with loss of head

passes thru the strainer from the outside. This small piece of equipment prevents hair, lint, etc. from reaching the filters, hence is a real aid in lengthening the time between filter washings.

Suction cleaners are provided at many pools by which the settlings can be cleaned from the floor and walls of the pool. This equipment works on the principle of the vacuum cleaner, pulling the dirt into the suction pipe, from where it is wasted into the sewer or pumped on to the filters. Several connections around the pool, preferable below the water level, are desirable for ease in using the cleaner.



Haircatcher for removing sticks, hair and larger objects from the water as it goes to the purification equipment.

Heating the Pool Water

In very few outdoor pools in Iowa will it be found necessary to heat the water. Heat from the sun and from summer winds will usually warm the water to a comfortable temperature within a few hours after filling. If a heater is installed it should be of a type which will heat the water as it passes thru the circulation system. Blowing steam into the pool, or installing coils directly in the pool cannot be recommended. Heating equipment may be considered a pleasant luxury but hardly a necessity for the average Iowa community pool.

Disinfection of Pool Water

Is disinfection of swimming pool water necessary? If it is, what are the most effective and economical methods of disinfection? The answer to these questions is simple and definite.

First, disinfection is necessary. While efficient filtration removes almost all of the harmful bacteria and infectious material, there are times when the filters may not be working properly and when disease producing bacteria might be carried thru and back into the pool. And again, filtration, while it may largely remove harmful organisms, cannot combat in any way new pollution which may be introduced into the pool after filtration and before the water may be recirculated back to the filter. The community has a responsibility in protecting the boys and girls who use the pool from this hazard to health and even life.

Hence it is evident that some form of disinfection is needed, preferably an agent which will not only destroy any lurking bacteria which may get thru the filters, but that will also continue to have a mild disinfecting action on the water after it is carried back into the pool.

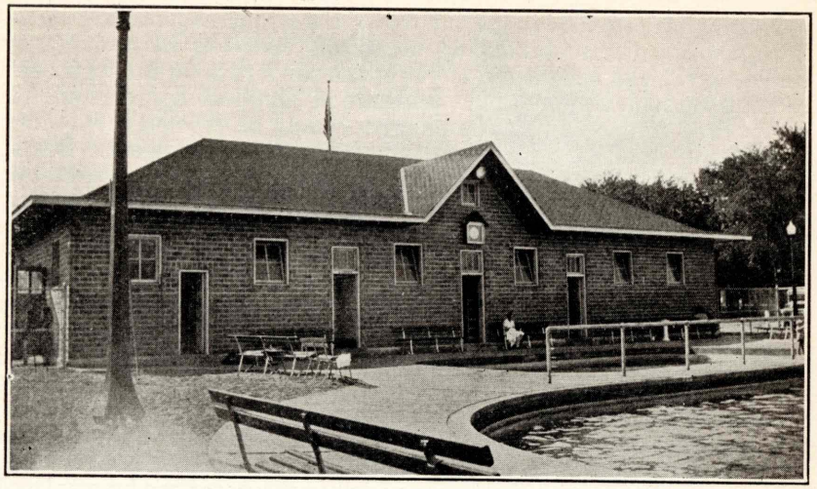
Nature has provided in the sun one of the strongest purifying agents known. No disease producing organisms can long exist under its direct rays. The beneficient effect of the sun's rays on the water of a swimming pool are but little understood and less appreciated. If every drop of water in a swimming pool could be exposed to its direct rays there would be no need for any other purifying agent. Strong sunlight is not always available however and the call of the swimming pool to youth will not be held in abeyance by the whimsey of nature, so we must search farther for a more dependable safeguard of the purity of our swimming pool water than "Old Sol."

Chlorination. Perhaps the most satisfactory method of disinfection in use today is that of adding chlorine either as a gas or as a water solution. With proper chlorine apparatus the water can be thoroughly sterilized as it comes from the recirculation system and filters back into the pool; such apparatus has the additional advantage of permitting a residual amount of chlorine to be maintained in the pool at all times which will sterilize immediately any dangerous pollution introduced by the bathers. Modern chlorine apparatus is designed so the amount of chlorine added to the water can be regulated very accurately. With a residual of 0.1 to 0.5 parts per million available chlorine, protection is given against pollution introduced into the pool, yet the amount is so infinitesimal that the dosage should not be apparent to the bathers either thru the chlorine smell or by irritation of the membranes of the eyes, nose, mouth or throat. Treatment with chlorine is recommended by health authorities wherever there is any appreciable bathing load or where bathing suits are worn.

Hypochlorite of lime or hypochlorite of soda are still used occasionally for swimming pool disinfection. They are very effective when applied continuously, but are hard to handle. When exposed to the air these chemicals change rapidly in chlorine content, and thus diminish in value as disinfectants. When applied intermittently they can be considered only as a makeshift. Such application does not permit accurate control of the residual chlorine content with adjustments for heavy bathing loads.

Ultra-Violet Rays. A second agent used to sterilize pool water is the ultra-violet ray. By this method the water must be repeatedly exposed in a thin film to ultra-violet rays. To be effective the water must be clear and nearly colorless. In Iowa considerable difficulty may be experienced due to precipitation of iron and other mineral salts on the quartz tubes, thus making them opaque to the actinic rays. Under favorable conditions this process is satisfactory in sterilizing the water. There is no evidence however to show that it provides any residual disinfectant against pollution introduced by the bathers. As this direct infection from bathers is by far the most dangerous, the ultra-violet ray method cannot be recommended alone for the safe treatment of pool water.

Ozone. Apparatus for sterilizing the water with ozone is also in use at some pools. Reports would indicate that it is reasonably satis-



The Webster City bath house. Economically but substantially constructed of face-tile. Purification and equipment room shown at the left.

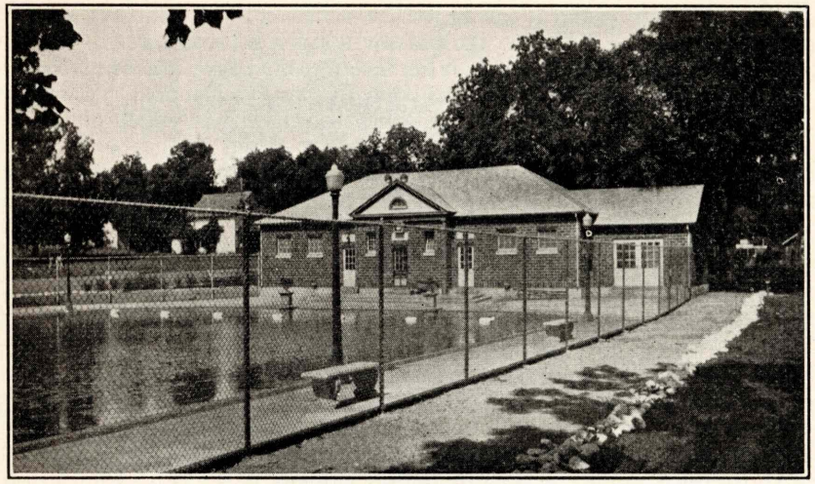
factory as a sterilizing agent, altho there is no evidence to show that it has any residual protective effect after the water has been treated. Hence with present data it cannot be recommended as a pool disinfectant.

Copper Sulphate. Treatment with copper sulphate alone will not give proper bacterial control. It is, however, very valuable when used with other approved disinfectants in controlling the growth of algae in swimming pools. A dosage of ½ pound of copper sulphate to each 10,000 gallons of water is suggested. The chemical may be placed in a cheese-cloth bag and dragged thru all parts of the pool until it is dissolved. Two or three treatments a week may be necessary in mid-summer.

Costs. Little accurate information is available for comparing the costs of different methods of pool disinfection. Under average conditions, however, the chlorine apparatus will be much cheaper than either the violet-ray or ozone equipment. Operating costs will be less, and the cost of chlorine will nearly balance the cost of electricity for the other methods.

THE BATH HOUSE

A bath house is a necessity to properly accommodate the patrons of an outdoor swimming pool. Housing facilities are required for the office, lockers, dressing rooms, showers, toilets, laundry and any other accessories such as a refreshment stand. The structure need not be expensive, but it should be attractive and of a type which will harmonize with the plan of the pool and its setting.



Estherville bath house. Construction of face-tile. Purification, equipment housed in wing on the right. The concrete walkway, bordered by a high closely woven fence enclosing the pool area, is also shown. Landscaping, which includes grass plots, shrubbery, trees, sand and stone promenade, all outside the pool enclosure so dirt or grass will not be carried into the pool.

The shape of the bath house is influenced somewhat by the shape of the pool and its location on the site. The bath house may be placed along one of the long sides of the pool or it may be at an end or corner with the wings along each side. From the standpoint of safety it is important that the exits from the bath house be located at the shallow end of the pool.

Interior Plan

The interior design of the bath house is determined largely by the units which must be included and their arrangement to facilitate the handling of bathers. The most efficient design is one in which progressive procedure thru the bath house is made possible, thus permitting maximum crowds to be handled with the least congestion. The arrangement should be such that the patrons come to the cashiers window first, where they are given tickets for lockers, suits, towels and any other supplies needed. Next they pass to the supply counter where valuables are checked and all supplies called for on the tickets obtained. From this counter the men patrons should pass to a dressing room on one side and the women to the other.

A popular arrangement is that in which the entrance, cashiers window, check room, and office are located in the center with wings on each side containing dressing rooms, toilets, showers, and purification equipment. Naturally the size of the bath house must be such that the various units may be accommodated with provisions for handling the maximum crowd expected.

Two different plans of caring for the street clothes of the bathers are in common use. With one the patron is given a basket, retires to the dressing room where he puts on his bathing suit, then places his street clothes in the basket, and checks it on the way to the pool. With the other method the patron receives a key to a locker in which his street clothes can be placed. He retains the key while in the pool. This second method is easier for the attendants but requires more locker space.

Dressing Rooms

Dressing rooms should be light, roomy and attractive in appearance, and should be constructed so that they may be easily and thoroughly cleaned. It is very desirable that the walls and partitions of all dressing rooms be made of smooth impervious material. If wood is used all cracks and joints should be filled and the surface kept finished with paint. Floors should be of smooth, finished material, impervious to moisture. To permit of easy washing they should all slope ¼″ to the foot to floor drains. Junctions of floors and walls should be finished with rounded joints. Every room and hallway needs good ventilation and lighting.

Shower Rooms

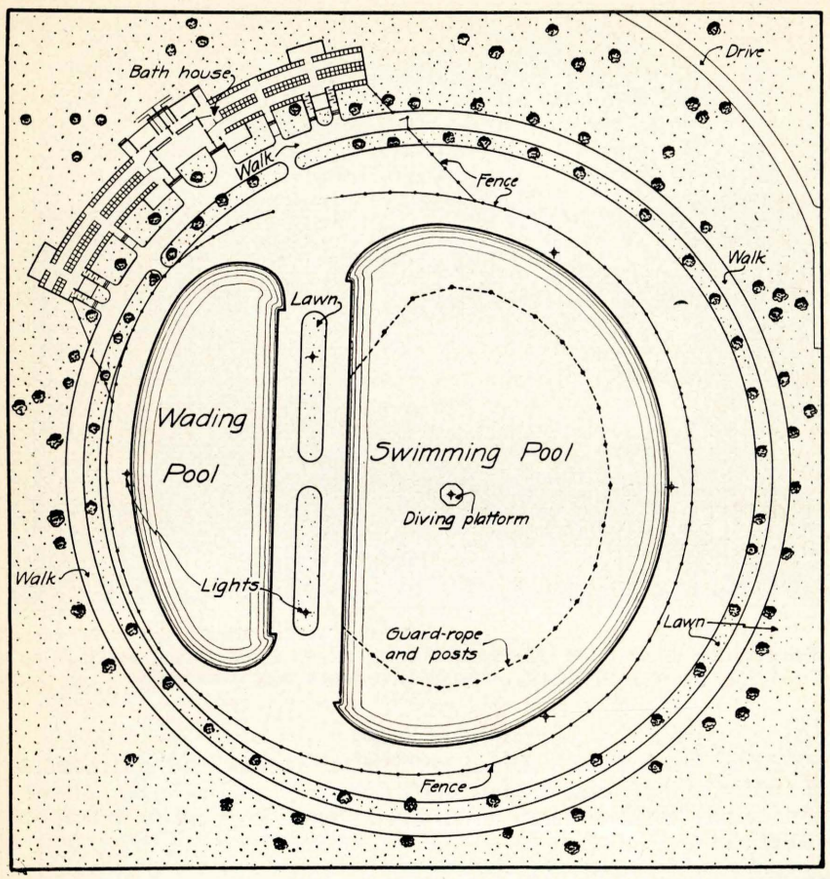
Shower rooms should be located between the dressing rooms and the pool. One shower to each 40 bathers expected at the time of maximum load is the minimum which should be provided. Both hot and cold water are essential. A Bidet or upward flow spray beneath each shower is also desirable. Adequate lavatory and toilet facilities must be provided, the number being about the same as the number of showers recommended.

Equipment Room

A separate room is needed in the bath house for housing water purification equipment, and for storing chemicals and cleaning equipment. The small heaters for warming water for the shower baths can also be placed in this room.

THE COST OF THE PROJECT

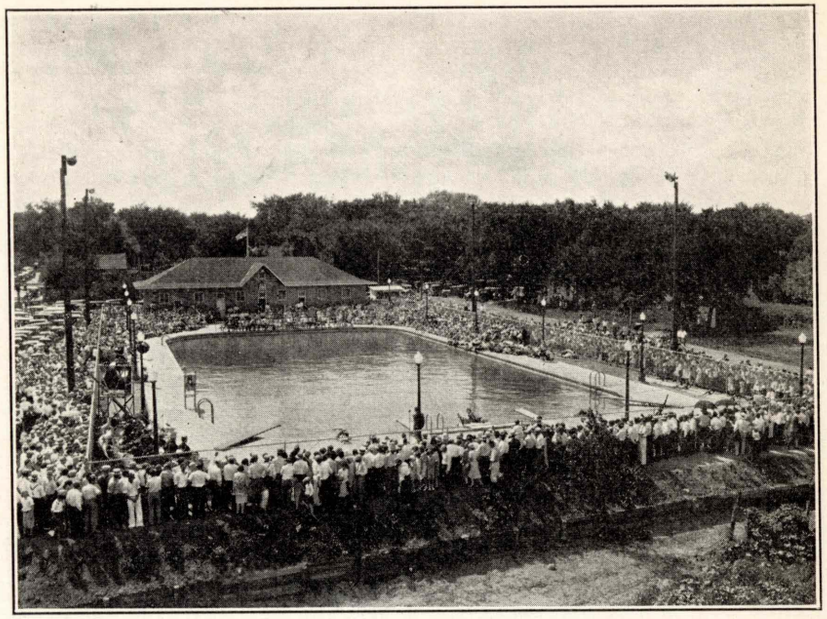
The four major parts of a swimming pool project, namely, the site, the pool proper, the bath house, and the purification equipment all enter into important consideration in determining the total cost. The relative cost of each part will vary a good deal in different localities and with the elaborateness of the design. The pool and the bath house present the greatest opportunity for varying the cost. For identical needs the pool may be simple in design and moderate in cost or elaborate and expensive. Likewise the bath house may be ornate in design and constructed of costly materials or simple in plan and built of materials having a low first cost. The funds available must necessarily dictate the elaborateness of the design.



Plan of a municipal swimming and wading pool project.

The Pool Site

Occasionally a suitable site may be donated by public-spirited individuals or by a park board. Usually however the site must be purchased. Naturally all of those factors which influence the price of real estate will be operative in determining the cost of the pool site. Chief of these is the location. To be situated close in where it is readily accessible to all is important, and while a site so located will cost more it will also bring in an appreciably larger revenue than where the pool is remotely located. On the other hand a site in the business district, near railroad yards or in a factory section is undesirable. Its cost may be excessive, and it will have the added disadvantages of



Courtesy Webster City Chamber of Commerce

Webster City pool at the opening ceremony. A well advertised, enthusiastic opening will boost the pool attendance very materially.

collecting dust and soot, of being subject to the noises and distractions of traffic, and of being a contributory cause of accidents, as patrons, particularly small children, cross busy streets in going to and from the pool.

The Pool

The general design and size are the two major factors which affect the cost of a swimming pool. When these have been worked out, with the special requirements of the community in mind, an engineer or contractor who is familiar with local prices of labor and material can furnish a preliminary estimate of the cost of the proposed pool.

Definite, well worked out plans will enable a contractor to determine accurately the several items which must be considered in constructing the pool. Such plans are therefore a factor in securing reasonable bids on the project, as it will not be necessary for the contractor to include a sizeable contingency fund in his bid to cover unknown quantities and conditions. The contractor's detailed estimate of cost will include such items as clearing of site, excavation, concrete materials, form lumber, reinforcing steel, valves, piping, accessories and labor.

Swimming pool at Marion. The bath house and purification equipment room are shown in the background.

The Bath House

Of all of the component parts of a swimming pool project, the cost of a bath house can be varied most widely as the funds available dictate. A small frame structure may be constructed if necessary which will serve temporarily at a very low cost. On the other hand if funds will permit a substantial building may be erected of stone, brick, tile or stucco which will blend into an attractive setting for the pool, giving the whole an air of permanence and solidarity which is a distinct asset. In the long run the cost of the various types is nearly the same, the low first cost of frame construction being overbalanced by a high depreciation and replacement cost. On the other hand the more permanent types of construction with a higher first cost have a very low maintenance cost.

Purification Equipment

Equipment for purification and sterilization of pool water is being recognized as a most necessary and important part of the capital investment in the pool project. It provides an economy over the old method of refilling with fresh water, and gives assurance that the health of the patrons is being protected and the continued popularity of the pool safeguarded.

Purification and sterilization equipment for pools has become so well standardized that the cost for any particular installation can be estimated very closely.

FINANCING

Outdoor swimming pools may be financed in many different ways. Among these are from public funds, by community subscription, thru selling pool memberships, and by commercial interests.

Public Funds

Fortunate is the municipality which has funds available to finance the construction of outdoor swimming facilities for its people. Many public pools are located in park areas, and it is sometimes possible to finance all or part of the pool project from funds allotted to the park board. In other towns special bonds are voted and issued to cover the cost of constructing the pool.

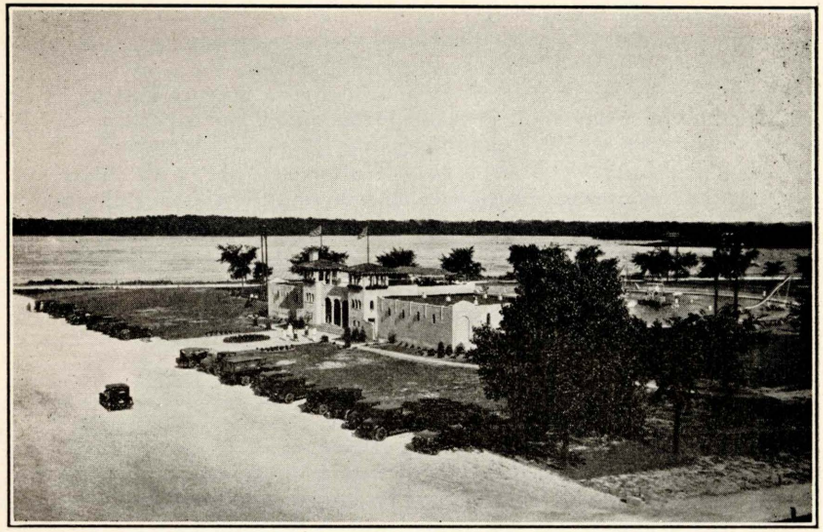
A number of Iowa municipalities have built swimming pools thru public funds. Webster City has financed the construction of a sizeable public pool, face-tile bath house, and complete purification equipment, thru a bond issue. Estherville has likewise built a well designed, attractive and permanent pool, bath house and purification system thru public funds. Among the smaller municipalities, Vinton is an example of a town of 3400 which has constructed a pool, part of the cost being raised by a bond issue and the remainder thru city funds.

Community Subscription

Where public funds are not available, many communities have found it possible to construct a swimming pool thru public subscription. It is usually necessary for some organization such as the Rotary Club, the Kiwanis Club, the Lions Club, the Chamber of Commerce, or the American Legion Post to take definite responsibility and leadership in pushing the campaign thru to successful completion. One organization may take the entire responsibility or occasionally several will join in promoting the project.

Vital community interest in the project is necessary for its success. To secure this interest it will be advisable to plan and conduct a very definite educational campaign. The recreational and civic aspects of the project should be explained; the possibilities of a pool in the way of healthful play and body building exercise for young and old are of interest to the people of a community, and they are entitled to know the "why" and "how" of a project which they are being asked to support. It will be well to explain the different units which are necessary in the complete project, the reasons for building a pool of certain shape and size, the essentials of a community bath house, and the need and importance of adequate water purification facilities. All of these factors explained thru the newspapers and by word of mouth will aid very materially in the response of the community.

After this preliminary preparation, a thoroughgoing campaign for contributions may be energetically carried thru. With the community



Courtesy Clinton Chamber of Commerce and Beil Studio

Clinton bath house and swimming pool. Attractively designed and placed in a beautiful park setting beside the Mississippi River.

heartily backing the project some may wish to donate materials, equipment, labor or professional service. By accepting these contributions everyone is enabled to have a part in this community endeavor, and the total amount of money needed to complete the pool is thereby lessened.

The American Legion Post of Marion, Iowa successfully carried thru such a campaign in 1930 for a complete pool, bath house, and purification equipment. The firemen of Dension sponsored the $16,000 pool project in that city. It is worthy of note that this pool has paid for itself in three years.

Pool Memberships

A somewhat different method of financing has been followed in several Iowa towns. Instead of securing public subscriptions, season or life memberships in the pool have been sold. These memberships entitle the holders to use the pool without charge. Operating expenses are met thru revenue from patrons who are not members.

To be successful the same general principles must be followed which were mentioned for promoting a swimming pool project by subscriptions. Public interest and enthusiasm are essential, followed by a campaign which thoroughly covers the community.

Commercial Pools

Many swimming pools have been built as purely business enterprises. When well located and intelligently managed they have often

netted a splendid return on the investment. With the added incentive of profit a number of private pools have been better managed and more attractively maintained than many public pools.

An admission fee is charged at practically all pools. This fee is set at an amount which will cover current operating expenses, and in many cases, pay off the indebtedness on the pool. A publicly owned pool is usually placed on a self supporting basis. After all obligations on the pool have been met the fees may be reduced till they are merely sufficient to cover running expenses, and provide for suit, towel and equipment replacements, general maintenance such as painting, and other miscellaneous expenses.

POOL AND BATHHOUSE REGULATIONS

Purity of Water

Fresh or purified water must be added to the pool at a rate which will provide 1000 gallons of clean water for each twenty bathers. Weekly bacterial examinations will give a check on the quality. To safeguard the patrons the pool water should be of a quality which will meet the requirements of the State Department of Health.

The appearance of the pool water and its freedom from surface contamination will be materially augmented by keeping the water level in the pool at the height of the scum gutters. Floating matter may thus be flushed to the gutters and thence to the sewer.

Emergency Equipment*

A. Pole hooks, ropes, buoys, and other necessary life saving equipment must be provided and be readily accessible at all pools.

B. A first aid kit containing aromatic ammonia, tincture of iodine, sterile gauze, absorbent cotton, surgeons' plaster, and bandages of various widths should be provided for emergency use at all public bathing places.

Supervision of Bathers*

A. A swimming instructor, or other qualified attendant should be on duty at the pool side at all times when a pool is open to use by bathers. Such attendant should be in full charge of bathing and have authority to enforce all rules of safety and sanitation.

B. An attendant should be on duty at the shower room or entrance to the pool to inspect all bathers for skin diseases, open lesions, etc., and to insure that a proper cleansing bath has been taken.

C. At public bathing beaches one or more life guards should be on duty during all bathing hours.

D. Swimming pool attendants and life guards should be capable swimmers, competent in life saving methods and in methods of artificial resuscitation.

E. No bather should be permitted to enter the pool room or pool

*Reports of the Joint Committee on Bathing Places of the American Public Health Association and the Conference of State Sanitary Engineers.

netted a splendid return on the investment. With the added incentive of profit a number of private pools have been better managed and more attractively maintained than many public pools.

An admission fee is charged at practically all pools. This fee is set at an amount which will cover current operating expenses, and in many cases, pay off the indebtedness on the pool. A publicly owned pool is usually placed on a self supporting basis. After all obligations on the pool have been met the fees may be reduced till they are merely sufficient to cover running expenses, and provide for suit, towel and equipment replacements, general maintenance such as painting, and other miscellaneous expenses.

POOL AND BATHHOUSE REGULATIONS

Purity of Water

Fresh or purified water must be added to the pool at a rate which will provide 1000 gallons of clean water for each twenty bathers. Weekly bacterial examinations will give a check on the quality. To safeguard the patrons the pool water should be of a quality which will meet the requirements of the State Department of Health.

The appearance of the pool water and its freedom from surface contamination will be materially augmented by keeping the water level in the pool at the height of the scum gutters. Floating matter may thus be flushed to the gutters and thence to the sewer.

Emergency Equipment*

A. Pole hooks, ropes, buoys, and other necessary life saving equipment must be provided and be readily accessible at all pools.

B. A first aid kit containing aromatic ammonia, tincture of iodine, sterile gauze, absorbent cotton, surgeons' plaster, and bandages of various widths should be provided for emergency use at all public bathing places.

Supervision of Bathers*

A. A swimming instructor, or other qualified attendant should be on duty at the pool side at all times when a pool is open to use by bathers. Such attendant should be in full charge of bathing and have authority to enforce all rules of safety and sanitation.

B. An attendant should be on duty at the shower room or entrance to the pool to inspect all bathers for skin diseases, open lesions, etc., and to insure that a proper cleansing bath has been taken.

C. At public bathing beaches one or more life guards should be on duty during all bathing hours.

D. Swimming pool attendants and life guards should be capable swimmers, competent in life saving methods and in methods of artificial resuscitation.

E. No bather should be permitted to enter the pool room or pool

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enclosure, unless an attendant or other competent person is present. Solo bathing must be absolutely prohibited at all pools.

F. Whenever a pool is empty, entrance of all persons except pool attendants must be effectually prevented.

Personal Regulations*

A. All persons using a swimming pool must be required to take a cleansing shower bath in the nude, using warm water and soap, and thoroughly rinsing off all soap suds, before entering the pool room or enclosure. A bath after donning a bathing suit should not be permitted.

B. A bather leaving the pool room or enclosure for any reason should take a foot bath before returning. A bather leaving pool to use toilet should be required to take a second cleansing bath before returning.

C. All bathers should be instructed to use the toilet and particularly to empty the bladder before taking cleansing bath and entering the pool.

D. Any person having any skin disease, sore or inflamed eyes, cold, nasal or ear discharges, or any communicable disease must be excluded from a public swimming pool.

E. Persons having any considerable area of exposed sub-epidermal tissue, open blisters, cuts, etc. should be warned that these are likely to become infected and advised not to use the pool.

F. Spitting, spouting of water, blowing the nose, etc., in the pool should be strictly prohibited. Bathers should be instructed that the scum gutter is provided for expectoration.

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HOME ECONOMICS
INDUSTRIAL SCIENCE
VETERINARY MEDICINE

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Extension courses are conducted at various points throughout the state.

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