suitable to the location and in groups necessary in the future grove from a forest and woodscape point of view. Nut-bearing trees, especially, lend themselves to this type of reforestation, as evidenced by the work of squirrels, but trees which bear seeds to some extent may be planted in a similar way.

This method is followed up with the planting of native seedling shrubs and trees from the Park nursery, or by evergreen seedlings purchased from the Department of Forests and Waters, State of Pennsylvania, and in other cases by larger, deciduous trees. The planting locations chosen are those which have no agricultural value, water sheds and eroded areas, or such hills and declivities that in the transformation into wooded slopes, will have esthetic and limited recreational value for hiking trails, bird walks, camps, or nature study. The level areas, usually valuable from recreational standpoints as play areas, are left in their natural condition until such time that they can be properly developed.

Seedling evergreens planted in the County Parks a few years ago are making splendid growth and may be seen from afar adorning formerly bare hillsides.

In keeping with the annual reforestation program, 60,000 Red Pine and 10,000 White Pine were planted in 1931, of which 30,000 Red Pine and 5,000 White Pine were set out in South Park. Of the deciduous hardwoods planted were, 1500 Silver Maple, 800 Sycamore, 250 Red Oak, 100 Black Oak, 1500 Green Ash, 200 White Ash and 200 Sugar Maple, in whip sizes, from the Park nursery.

Shrubs and trees have been planted in connection with the new camp ovens at North Park; Oakdene, Cottonwoods, Hickories and Ledgewood.

In South Park, shrubs and trees have been planted in connection with the Rrefreshment Shelter at Spreading Oak, Stone Manse, Edgebrook, and largely at the Swimming Pool.

Large, desirable shade and ornamental trees, standing in hedgerows and unrelated to future projects, and others growing beside abandoned roads or in the path of projected roads, were dug with ample balls and moved on the Golf Course, for screens and landscape effects. Of the 155 trees moved, but two have died, all others apparently doing well. These trees ran in sizes from two inches to fifteen inches in thickness and were composed of the following species: 53 Sugar Maple, 4 Hickories, 7 Elm, 5 White Oak, 21 Ash, 3 Large-toothed Aspen, 3 Blue Beach, 1 Black Willow, 2 Ironwood, 22 Flowering Dogwood, 30 Hawthorne, 2 Wild Crab and 2 Spice Bush.

Eighty pounds of seeds were collected from Park trees and shrubs and planted, 106 pounds of seed being purchased and stratified for spring seeding. In addition, there are growing 26,035 one-year old native seedlings of many varieties, in the Park nurseries, 17,060 shrubs and trees of lining-out size, 5,809 shrubs of 2-3 foot size, 2,765 of 3-4 foot grade, 3,912 of 4-6 foot size, and 325 of 6-12 foot size.

Dead trees and limbs have been removed in 14 groves, the trees trimmed and spraying done wherever found necessary. All plantings and forest plots have been given necessary care, looking to ther welfare and growth.

WATER SYSTEM

Mains were laid from No. 1 Well, (ground elevation 1012 feet), in North Park to a 15,000 gallon pressure tank on top of Pine Hill, (elevation 1230 feet), and other mains and laterals installed and completed in the early winter, supplying the golf course proper, the horse stable, buffalo preserve and office. This well furnishes 225 gallons of water a minute.

Well No. 2, (ground elevation 1003 feet), drilled 600 feet northerly of Well No. 1, also in the Pearce Mill Valley, at the site of the proposed swimming pool, furnished 110 gallons per minute.

The water from both of these wells, while differing in analysis, show high basic carbonates and salt content, and their reaction upon the greens within a single growing season would prove injurious. There seems no objection to its use for bathing, drinking or filtering purposes at the swimming pool.

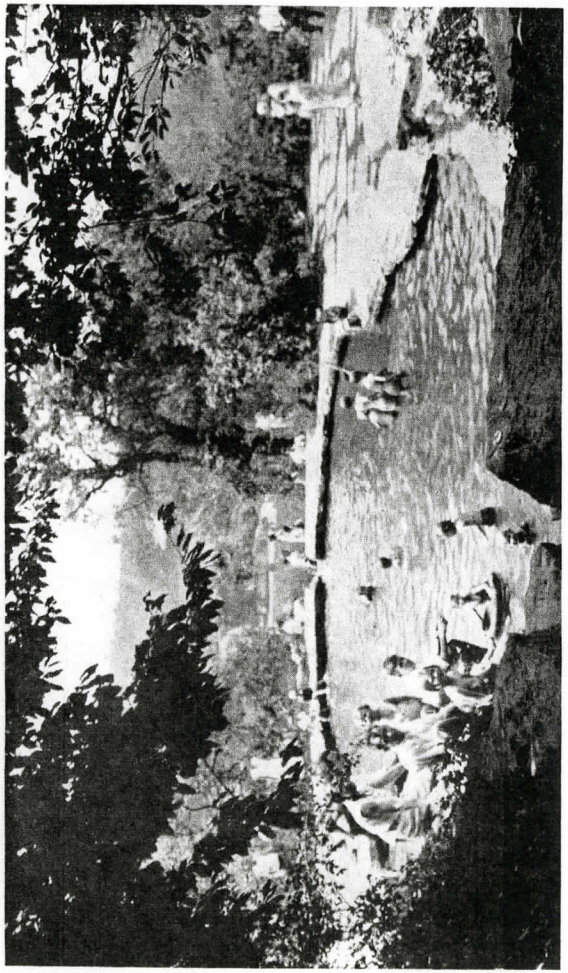
In order to provide a still greater supply of water, sufficient for the entire Park, and at the same time possibly locate a source of water more suitable to plant life, an eight inch well, (Well No. 4), was drilled at Orchard Lawn, directly above the Mount Nebo syncline. Though the well was drilled to a depth of 355 feet, it produced but 50 gallons per minute. Because of its high basic carbonates and salt content, depth of well and insufficient quantity, this well is not to be considered in the future scheme as a segregated unit in the water system for North Park.

Another well, (Wildwood Well No. 3), (ground elevation 956 feet), also of an eight inch bore, was drilled to a depth of 155 feet, near the confluence of the north and south branch of Pine Creek, at the lower end of the Park. An abundant supply of water was encountered, and, on a bailing test, delivered anywhere from 150 to 300 gallons per minute. This water has a lower or nearly one-half the carbonate and salt content of that found in Well No. 1, hence, will prove more suitable for purposes of irrigation on the Golf Course.

It, however, becomes necessary to pipe this water up the valley to the Golf Course, a distance of nearly two miles. It will prove advisable at the same time to provide convenient and necessary outlets along its route to supply other portions of the Park. An extension from this well will be made southerly to a proposed storage tank, (ground elevation of 1182 feet—bottom of tank 1212 feet), on the newly acquired Sample Property. Here a combination steel gravity and pressure tank of 50,000 gallons should be erected to serve the high plateau, (1250 feet elevation), to the south, and, also, the valleys and the Golf Course to the north and east. This tank can be surrounded by a free standing, sixty foot ornamental stone tower, serving as an observation point over the entire Park, the Pine Creek and Wildwood valleys.

The combined minimum capacity of Wells No. 1, 2 and 3 is 485 gallons per minute, with a maximum capacity of 635 gallons per minute, an ample amount to supply all possible needs in the Park for many years to come.

Samples of water taken from these wells have been submitted for bacteriological and chemical tests, and in turn were retested by manufacturers of filtering apparatus, and the results submitted to the



Stone Manse Wading Pool, South Park. Pure Water, Sanitation and Proper Depth Are the Tangible Values of a Successful Wading Pool

agrostologists of the United States Golf Association Green Section, Washington, D. C., the State College of Pennsylvania, and the Agricultural College of Amherst, Mass., to determine the suitability of this water for the purposes of drinking, bathing, filtering, irrigation and vegetation.

That the effects of the water upon the greens could be definitely ascertained, repeated LaMotte tests were made to note its cumulative reaction upon the grasses.

LaMotte tests in simple chart form readily explain themselves:

Alkaline — | — Acid

9 - 8 - 7 - 6 - 5 - 4 - 3

Thus a 7-6 P.H. Test of soils is the most desirable for bent grasses; the symbol P.H. is used in the LaMotte method to dencte either alkalinity or acidity of the soil. Therefore, it is evident that P.H. 9 is dangerous alkalinity, while P.H 3 is too acid, to grow any vegetation.

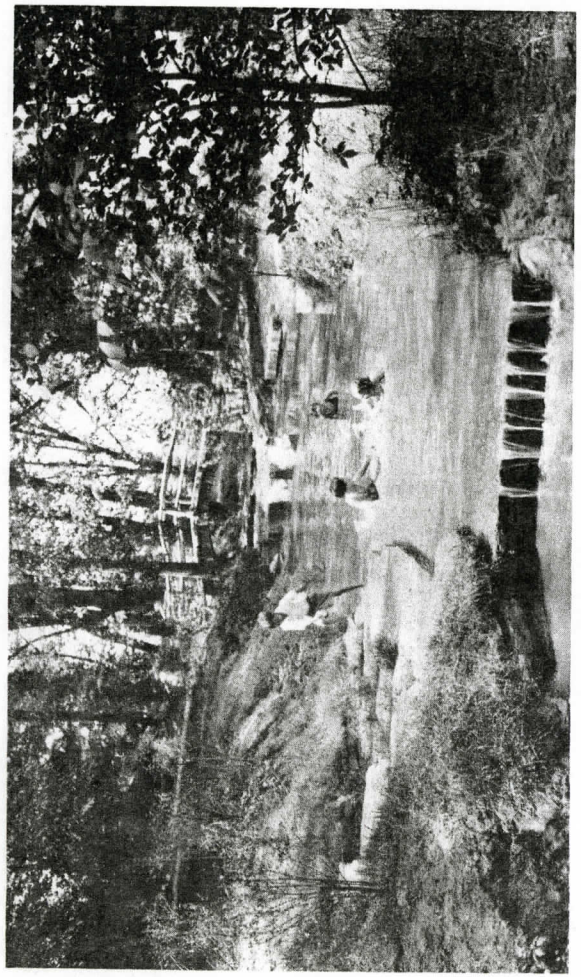
These greens, previous to receiving any artificial watering this past summer, had a P.H. value between 5.5 and 6.0. This figure is close to the optimum value for Bent grass. Since that time, they have received no lime and only acid reacting fertilizers, largely ammonium sulphate, which has been applied in the amount of twelve pounds to a thousand feet. In addition, they have been top-dressed heavily with loam, testing around 5.5.

Watering was not started until around July and then heavily and as infrequently as possible. In spite of these precautions, the soil became strongly alkaline, due to the basic elements in the water, testing as high as P.H. 8.0 and over. These tests were made in November, prior to the winter rains. The grass, of course, has suffered considerably and this condition has made it very hard to control clover and other broad leaved weeds.

At this date a certain amount of leaching has taken place, the tests showing a P.H. value slightly over 7.5. It does not appear probable that leaching will proceed fast enough to bring the desirable degree of acidity by spring. Even should this be accomplished, under the present condition, we would again have the highly undesirable alkaline condition late in the summer under the cumulative effect of regular waterings.

This condition, if not remedied, at least would be greatly improved if water from the Wildwood Well were to be turned into the lines in preference to water from either No. 1 or No. 2 Well.

The present high carbonate and salt content is unquestionably due to the presence of abandoned and unplugged gas wells in this region. A withdrawal of large quantities of water through pumping in the years to come may, no doubt, lower the salt content, but there is no definite assurance thereof. Hence, I feel that a new main from No. 3 Well will partly solve the irrigation problem.



EDGEBROOK, SOUTH PARK
Softening of Shores and the Addition of a Few Stones Idealized This Woodland Brook to Combine Utter Natural Beauty with Intense Human Use

For a matter of record an analysis of the various wells is hereby appended.

	Pine Hill Well No. 1	Swimming Pool Well No. 2		Wildwood Well No. 3		Orchard Lawn Well No. 4
	1 Sample	Morning Sample	Afternoon Sample	Morning Sample	Afternoon Sample 1	Sample
Calcium Carbonate	1.24	2.14	1.96	3.03	2.68	1.24
Magnesium Carbonate	1.84	1.33	0.36	0.82	2.09	Trace
Silica	12.84	1.96	2.12	6.56	5.52	4.72
Iron & Alumina	.84	None	None			.44
Sodium Sulphate	.80	0.43	0.55	0.90	0.24	.80
Sodium Chloride	94.04	59.87	59.87	48.35	63.53	75.07
Sodium Carbonate	21.89	27.70	30.30	19.06	15.72	28.60
Iron Oxide				Trace	Trace	

A six inch well was driven in the sanctuary at North Park to a depth of 125 feet, for hikers and picnic groups. The supply here, however is neglible of perhaps twenty gallons per hour.

Water mains and laterals were laid at Valley Heights, (Sulli's Grove), in South Park, to provide drinking water and connections for future use, all of these with a frost-proof, four foot cover in the following lengths and sizes:

2,000 ft. 4 inch Cast Iron Pipe

530 ft. 1 inch Galvanized Pipe

Extensions were, also, made to provide drinking water to Ridgewood and Twin Hills Groves as follows:

1,253 ft. 2 inch Galvanized Pipe

500 ft. 1 inch Galvanized Pipe

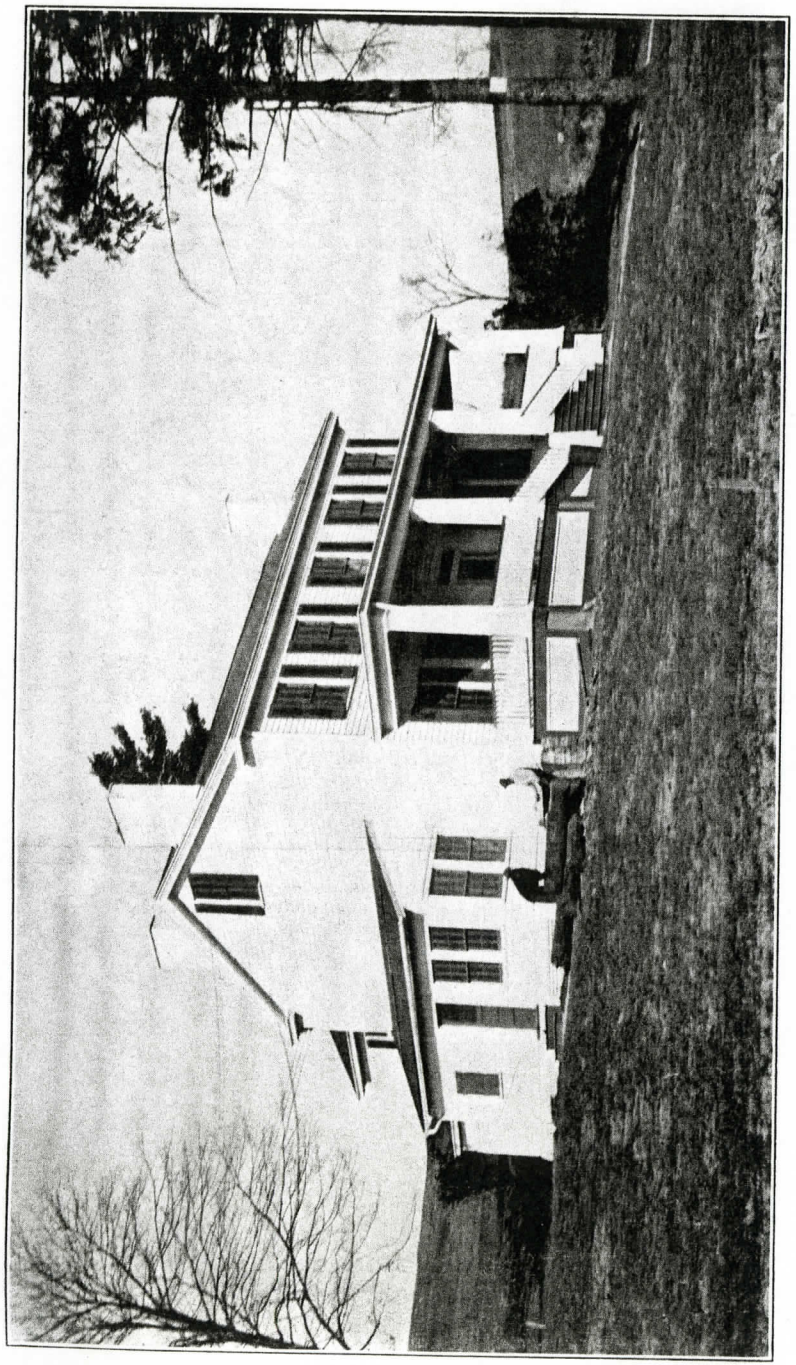
BOY SCOUT CAMP

Considerable work has been done to improve McMaster's Farm Home, given over to the Boy Scouts of Allegheny County as a scout camp.

The grading of the service road known as "Maple Spring Drive" leads past this camp to the south. The sub-grade has been completed and given a temporary base of red dog.

The area surrounding the house has been graded and seeded, and such walks placed as were deemed necessary for a proper circulation system.

The outside of the building has been painted while renovation is still progressing within. A large assembly room has been made possible by the removal of several partitions. This room is being furnished, in that a rough stone fireplace and log mantle shelf have been placed on both the east and west side. The ceiling effect is of hewn beams and the plastered walls tinted in imitation of the early period clay plaster.



Boy Scout Camp Headquarters—South Park

A First Aid room is situated on the first floor, also, a small kitchen for cooking on inclement days.

The upstairs, serving as a dormitory, will be finished in simple, tinted plaster effects, with the individual scout troops furnishing bunks, tables and chairs.

The cellar floor of the west half has been lowered a foot, stone fireplace built, and log seats installed, a flagstone floor laid, which in combination with its exposed beam ceiling, produces the charming effect of a well appointed den, so dear to a boy's heart.

The other portion of the cellar is to be similarly lowered that, in its final, may permit the installation of showers, toilets and wash-room.

An office on the first floor completes the appointment of this building.

The Boy Scout Camp has served as headquarters for detached troops, and assembly on a number of occasions during the past summer.

SERVICE GROUP

To centralize storage of trucks, machinery, etc., service groups have been designed for both North and South Park.

The group in North Park is located in the ravine near the Pearce Gas Well, away from interference of any other activity and hidden in a manner that its presence does not mar the magnificent sweep of the valley, nor intrude itself upon the landscape otherwise.

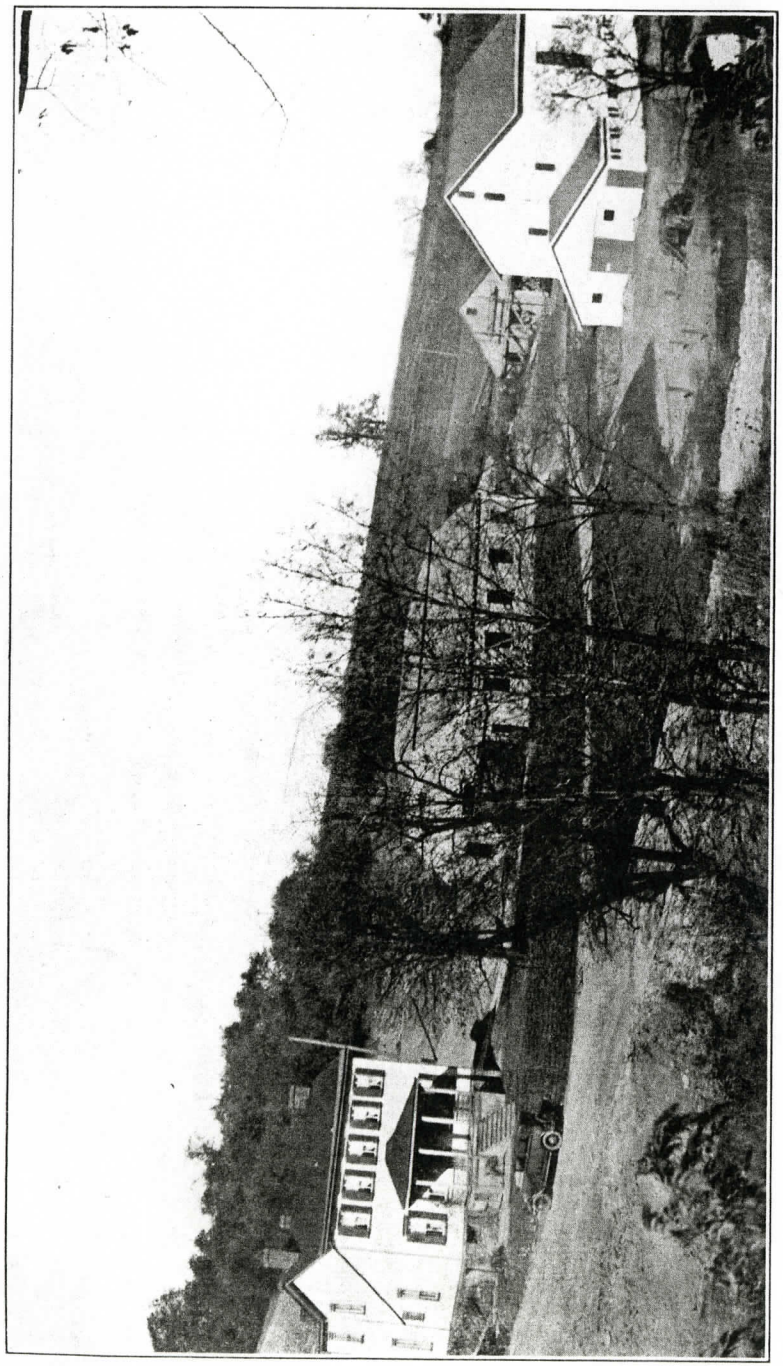
Of the buildings designed are a stable to house the work and saddle horses of the Park, a residence for the stable boss, a large garage, work shop, a blacksmith shop, carpenter, painter, plumber and electrician shops, each in separate units, granary for seeds and feed, storage for cement, lumber and fertilizer. All of these materials at present are inadequately and scatteringly housed.

In North Park the walls of the garage have been raised to the plate. The roof is to be completed under contract, as well as all other buildings in the coming year. Much of the building material is on hand.

In South Park it has been possible to utilize the Swiantek Farm Buildings to house the stable foreman, and the barn to stable the work and saddle horses. A large garage has been finished as well as the work shop and blacksmith shop, leaving the other buildings to be completed by contract the coming year. All buildings are of cement blocks.

This new arrangement is found very convenient and practical, in that it permits over-hauling of machinery, equipment and small tools by monthly men on rainy days, who otherwise have been unable to render much service on such days for want of proper facilities.

Golf service buildings have also been designed, to be let on contract for South Park, conveniently and unobtrusively located at the Triangle Grove where they are detached from all other traffic or



Service Group—South Park

Park activities. These buildings follow the design of pleasing woodland cabins, that they may become a part of the Park landscape.

A well house for No. 1 Well at North Park has been built of log and stone, and another for Well No. 2 has been partly constructed.

STONE QUARRIES

Stone quarries were operated both in North and South Park to furnish necessary building materials, slabs, and flagstones for rock work, paved areas and stepping stones.

The best supply in North Park was found just above Pine Creek, on the newly acquired Sample tract. This stone, however, does not compare in size and uniform layers with that found in South Park.

Here an unlimited supply still remains at the original McMaster Quarry that can be made available for immediate use at any time.

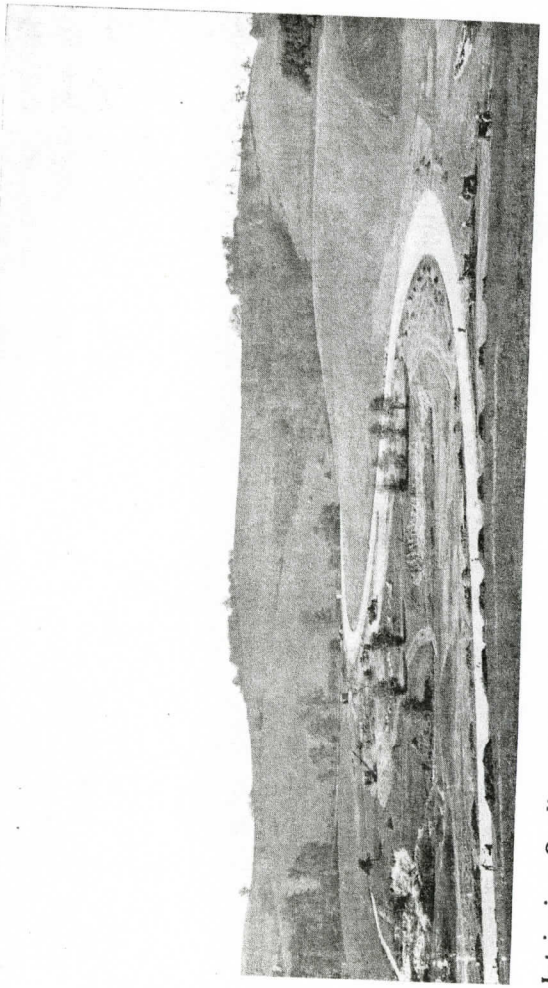
PARK DRIVES

That the drives partake of a true park and landscape character, the cardinal principles adapted eliminate all theoretical methods of location in the alignment of roads. Super-elevations are based on traffic speeds of twenty-five to thirty-five miles per hour, to discourage high-speed traffic. No maximum or minimum radii are established for curves, and their degree of curvature is largely determined by topographical conditions. Tangents are used sparingly; all road alignments meeting the natural contours of the ground.

Major roads are of four lane, thirty-six foot width and secondaries of three lane, twenty-seven foot width, while minor or service roads are made of two lane, twenty foot width, with two foot shoulders or berms to permit a later widening. All embankments in as far as possible are graded to retain natural repose, a method that leaves scarcely a scar on a twenty-five percent hillside. Gradients are held to a maximum of twelve percent. Careful studies, however, with little exception, make possible gradients not exceeding ten percent.

To determine surfacing material that in the final would present park character and good roads, careful studies were made of the various methods of construction. Standard specifications of the macadam-penetration, as advocated by the State of Pennsylvania, were selected as the most suitable and economical for our needs. This consists of two, four-inch base courses of air-cooled slag, a local by-product of the steel mills, with a three-inch penetration surface course, producing an eleven-inch roadbed when completed.

Since there are from fifteen to twenty miles of roads of various width to be built in each Park at a cost for North Park of $35,500.00 per mile for thirty-six foot, $26,700.00 for twenty-seven foot and $19,800.00 for twenty foot roads, (extra cost due to longer haul), and a cost for South Park of $29,000.00 for thirty-six foot, $21,750.00 for twenty-seven foot and $16,191.00 for twenty foot roads, for road materials only, exclusive of grading, a policy has been adapted to build the first four-inch course as a starter, treat this with an applica-



Intriguing Quality of Park Drives in No Wise Bars Complete Safety Factors of Curvatures or Gradients and Invariably Imparts Greater Naturalness

tion of bituminous material and add the remaining seven inches when funds became available. This method has proven entirely adequate so far and the roadbed has stood up under severe traffic. It is also possible, with this method, to use any other surface course, that in the meantime might prove more practical.

The sub-grade of Kummer Road from the County Bridge in North Park to the former Toogood farm, has been completed, a distance of 3,000 feet, exclusive of drainage and slopes. This road is of the usual thirty-six foot width and is the entrance to the Golf Course and the proposed swimming pool beyond. But 2,100 feet of sub-grade remain to be built to connect with that portion of the road completed around the Golf Course a year ago.

Ingomar Road, (1.15 miles), from the County Bridge to Babcock Boulevard, was in a deplorable condition. The road, where possible, has been somewhat widened and retreaded, using the mixed-in-place method of surfacing with slag and tar, and after, filling all holes. Such re-surfacing has proven very satisfactory and has stood up remarkably well under heavy traffic.

This method of re-surfacing was used by us for the first time in Allegheny County and the City of Pittsburgh has thought well enough of it to adopt it in their specifications.

Devil's Elbow has been eliminated and a straight connection made in place.

Portions of the North Park drives in need of retreading were so repaired, while all other roads were re-surfaced with a light coat of slag and tar.

Catfish Run Road, with its red dog base, at South Park, at present the main artery from Library Road through the Park—an old township road connecting farmsteads only, and too narrow for passing traffic—was, also, full of holes and in very bad condition. It has been apparent from the outset that this road will have to be abandoned in its entirety, within a few years, to give the narrow Catfish Run Valley greater value. Hence, its upkeep should be made as economical as possible until a permanent drive can be built. With this in mind, the old road has been widened four feet, a temporary and wider bridge built at its intersection with the Miller Road and its entire length of 12,000 feet retreated with slag and tar, resulting in a most satisfactory surface and an artery able to handle the intense traffic to and from the Swimming Pool.

The sub-grade of Maple Spring Drive, (McMaster Road), in South Park, a service road, has been completed and is ready for storm sewers and road materials. This drive has a length of 3,500 feet and a width of twenty feet. A light base of red dog has been partially spread over it to make it serviceable during winter and early spring, when it will receive its primary surfacing of slag and tar.

An additional thousand lineal feet of sub-grade was completed on East Drive, a major road, which completes the connection between Brownsville Road and that portion encircling the Locusts. The Linhart Road in consequence has been closed and in part abandoned.

One thousand lineal feet of East Drive, twenty feet in width, was surfaced with a four-inch bed of slag and penetrated with one gallon

of tar to the square yard, for a riding surface and dust treatment. Five thousand lineal feet, graded in 1930, has been surfaced with red dog for temporary use.

The sub-grade for the parking area of the North Park Club-house entourage, accommodating 225 cars, together with its drainage, has been completed, ready for a macadam base the coming season.

FARMING OPERATIONS

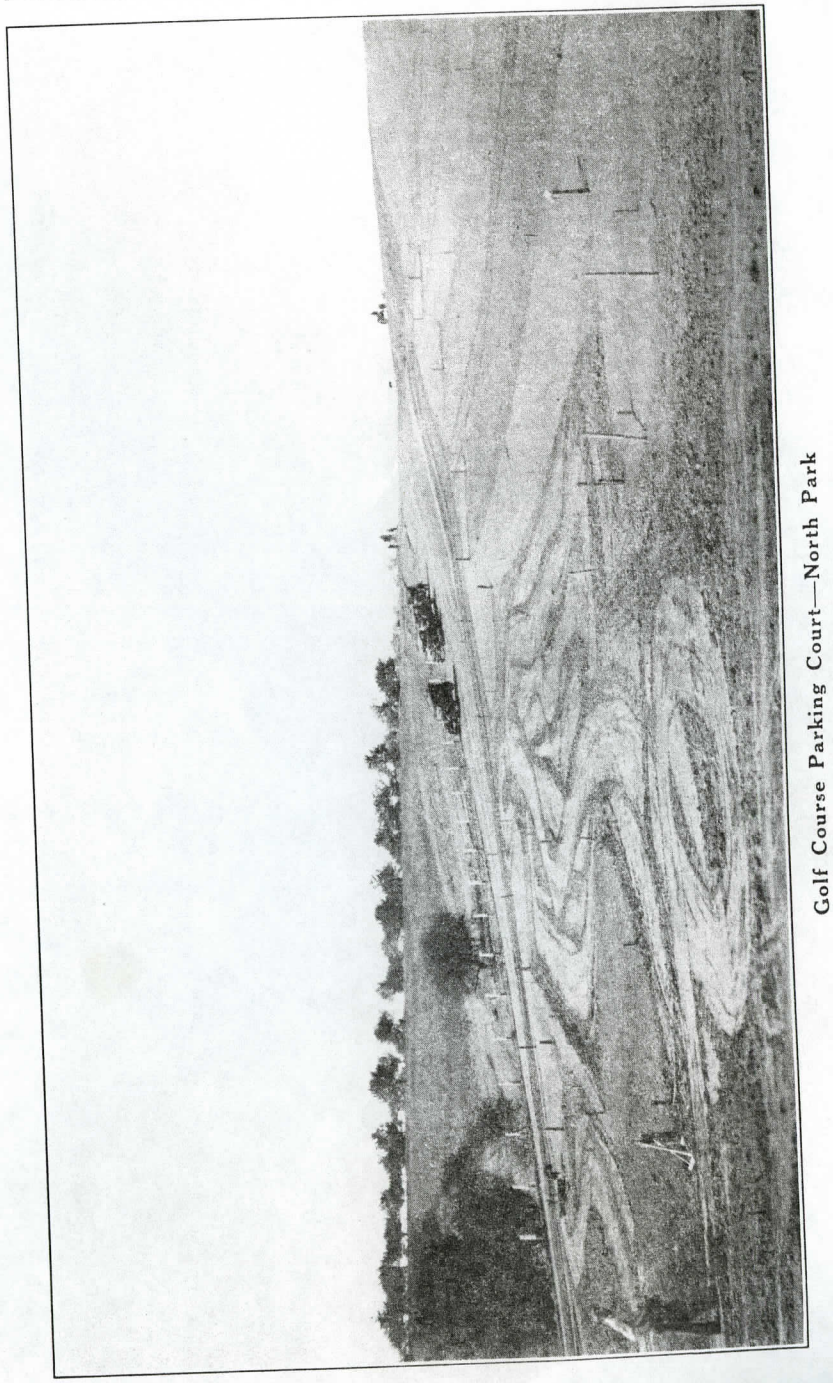
It has been found expedient to confine all agricultural activities to the cutting of hay, since the time of plowing, seeding, cultivating and harvesting of crops is coincident with the busiest Park season, calling upon the resources of the Park organization at the time of its greatest activity.

It, too, has been found cheaper to purchase oats and corn from localities better suited to these crops, both climatically and topographically, since the thin soils of our steep hills require considerable commercial fertilizer to produce average crops.

One hundred twenty-five tons of hay were cut in South Park and 150 tons in North Park. Anticipating the time when most of the Park land has been seeded down and reforested against further erosion, and as forage can be grown on limited areas only, Sudan grass has been grown experimentally in both Parks.

This forage not only produces a much greater tonnage per acre but can be sown and harvested at a period not conflicting with the more intense Park season. The buffalo, too, seem fond of it, and further trials will be made to determine its nutritious value. Ten acres of this crop was harvested in North Park and five acres in South Park.

There are at present ten work and six saddle horses in North Park, ten work and five saddle horses in South Park. Together with 37 buffalo and 125 deer, this large family consumes a considerable quantity of hay and grain. Steps should be taken to so reduce the deer herds and perhaps the bison, to keep down the number of dependent mouths.



Golf Course Parking Court—North Park

MISCELLANEOUS

Locust borers have done untold damage to locust trees in the Parks, until a healthy tree is a rare sight. The ravages of this pest, in part or wholly, kills trees of every age, leaving in their wake stark silhouettes of trees once bowers of graceful foliage and the soft beauty of life. That this enduring timber should not be wasted, saplings, limbs and trunks of suitable size or form, are saved.

The smaller poles and limbs are used to transform into rustic park benches and picnic tables, their seats and top boards supplied in pecky cypress. This not only produces an interesting piece of furniture of character, but durability as well. The Park force has turned out 150 tables of this kind and 41 benches. Fifty other picnic tables were also built by carpenters. Logs and heavier pieces are used in the building of the smaller Park structures and impart a mellow air of soft rusticity, hard to find in other woods.

All four inch branches trimmed from trees, dead trunks or stumps, and the waste lumber from razed buildings, are sawed into firewood for the many camp ovens. No less than two hundred fifty cords of such wood has been gathered the past year and burned to the last stick by Park patrons. It will not be long when measures will have to be taken to curtail the wood consumption of individuals and picnic groups, who seem oblivious to a near shortage of this commodity at this time.

The Ray McKinney House, in North Park, on account of defective chimney, burned to the ground on the eve of its occupancy by the stable boss. In consequence, the Eisenbach Barn was remodeled to house the work and saddle horses, where a residence for the stable boss was available close by for his accommodation.

At North Park the Irwin, Sample and Kummer houses were dismantled, also the Toogood and Rolshouse Barns.

In South Park, a number of worthless buildings in the Sulli group, were torn down.

Carpentry and masonry repairs were made on Park Buildings wherever necessary and a number of buildings painted in both Parks.

I desire to express my appreciation to Stanley L. Roush and his staff of the Bureau of Architecture, for their courtesies, help and supervision in the completion of the Swimming Pool, who at all times showed consistent interest, sympathy and understanding; to Messrs. Freeman, Groh and Betz in making specification in connection with a number of projects and materials of the Parks, and for chemical tests of water submitted to them for analysis from newly drilled wells; the County Solicitor, Mortimer B. Lesher, and his able assistants, all of whom have been helpful in many legal problems; and Controller Woodside and his staff. Their assistance has been timely, invaluable and freely given.

I further wish to express to your Honorable Board my sense of obligation for your kind and sympathetic cooperation, friendly counsel, unfailing patience, and for the confidence reposed in me.

Expressions of appreciation are, also, tendered to all members of the staff organization, police and workers, all of whom have rendered loyal and efficient service.

Respectfully submitted,

PAUL B. RIIS,
Director, Bureau of Parks
Allegheny County



Indian Squaw and Papoose