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Landscape architectural design of the cemetery

Harold Roy Kreiser

Iowa State University

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LANDSCAPE ARCHITECTURAL DESIGN OF THE CEMETERY

by

Harold Roy Kreiser

A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
MASTER OF LANDSCAPE ARCHITECTURE

Major Subject: Landscape Architecture

Signatures have been redacted for privacy

Iowa State College

1957
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INTRODUCTION

The general acceptance of the cemetery, by different societies, as the preferred burial place has made them an expression of culture, consequently numerous forms and various classifications such as monument and non-monument have developed.¹ This practice of burying the dead has also resulted in an enormous acreage of land devoted exclusively to cemeteries. This form of land use does not diminish or remain constant in respect to size but is constantly increasing.² As our society in the United States becomes more urban in character more and more of this cemetery acreage will be located in the metropolitan areas.³ In order for us to make the best possible and most efficient use of this land it is important that it is properly designed and developed.

The profession of Landscape Architecture concerns itself with the design and development of land and the objects placed upon it for the practical and utilitarian as well as the aesthetic potentials inherent in the site. Cemetery design is an important phase of landscape architecture and one in which the landscape architect is vitally interested because of the prominence of this type of land use in and around our cities.

¹See Cemetery Classification, Appendix A, p. 158.
²See Cemetery Acreage, Appendix A, p. 159.
It also affords the landscape architect an opportunity to use his abilities to enrich the scenic attractions of his community and further the appreciation of good, sound landscape architectural development. The relative permanence of the cemetery offers an opportunity to design and guide the development of an area which will exist long enough to reach its maximum esthetic maturity.

The landscape architect's knowledge of the various kinds of outdoor beauty and utility and the means through which they can be economically produced makes his services extremely valuable to the cemetery developer. His services are not alone concerned with studies in plan, section, elevation, planting plans and the esthetic possibilities of the site but also with the financial considerations. Even though the landscape architect is ideally trained to design and direct cemetery development he must rely on his own experience in this field of outdoor development. Very little information in the form of published works is available to him for study and reference. The basic design principles of landscape architecture apply to cemetery design but their application will vary and change according to the demands of our culture and the type of cemetery.¹

Our present philosophy of considering cemetery land as a relatively permanent land use will some day have to be re-

evaluated. We are annually setting aside a sizable acreage of land that will not be used for any other purpose than as a cemetery. Obviously, we cannot continue this policy indefinitely because some day the entire country will be devoted to cemetery purposes. This possibility is extremely remote because we will change our attitude toward the permanence of cemetery land before we find ourselves at the point where there is insufficient land for the living.

The cemetery as designed and developed today closely resembles a park and as such serves as an open space within our cities. Most of the cities in the United States are deficient in park or open-air spaces, therefore, it is desirable to retain and add to the open space acreage rather than reduce it. Several generations after the last burial is made in a cemetery there are very few people interested in the persons buried therein and permission to move the cemetery for city expansion is generally more readily obtainable than while the cemetery is still functioning as a burial place. Instead of exhuming the bodies and using the area for building purposes, the cemetery could be converted into a passive recreation area; thereby retaining it as an open-air space within the city. Such a policy will not reduce the ultimate acreage in cemetery use but it will make the land serve a double function.
Scope and Method of Investigation

Scope

The scope of this thesis, with the exception of the historical background, is confined to cemetery design and development as practiced in the United States. Even though our basic beliefs concerning burials and the disposal of the dead have been inherited from European culture, they have been carried beyond and perfected in a typically American manner. Our cemeteries have been influenced by our American traditions of aesthetic ideals and the American Park Style of Landscape Architecture. These two factors have resulted in some of the most attractive cemeteries in the world.

While recognizing that some segments of the population of the United States adhere to religious traditions other than Christianity, and consequently have different traditions concerning the disposal of the corpse, it is felt that these other religious groups are too insignificant, in number, to warrant their consideration in this study.

Method of investigation

Soon after selecting the subject of this thesis it became evident that very little work had been done in the field of cemetery design. Most of the books written concerning it, directly or indirectly, have been written prior to the 1920's. The Iowa State College Library, while not having all of the
books, has the most important ones. In an attempt to learn more about the literature of the field the Librarian at the Harvard University Library of City and Landscape Planning was contacted. However, this important library of Landscape Architecture was unable to supply much additional information.

The most valuable source of current literature about cemeteries is to be found in the current periodicals of which The American Cemetery is the most important. In order to supplement this source and to learn the feeling of men actively engaged in cemetery work, the writer prepared a questionnaire which was sent to various cemetery superintendents throughout the country. ¹

This questionnaire was sent to 110 cemetery superintendents throughout the United States and Hawaii with a response of 27 percent. Of the 27 percent responding, 66 percent of the cemeteries were of the monument classification, possibly indicating that the personnel of the monument cemetery are concerned with the trend toward the memorial park and consequently more attentive to the furtherance of a study of this type.

The results of this questionnaire and a study of landscape principles, particularly as applied to park design, form the basis for the information presented in this thesis on Landscape Architectural Design of the Cemetery.

¹See Cemetery Questionnaire, Appendix B, p. 166.
We shall therefore, give first consideration to the factors of history and culture which effect cemetery design and then discuss the physical and landscape elements of cemetery design and their influence in the development of the cemetery plan.
FACTORS AFFECTING CEMETERY DESIGN

The landscape design of a cemetery is a process of assembling various functional and esthetic elements to form a utilitarian and beautiful unit to serve as a burial area. The factors which influence the selection of these necessary elements and their assembling are rooted in our past history and the activities of every day contemporary life. The integration of different but essential aspects of our society takes on greater importance today than it did in the past because the United States is becoming an urbanized country. All facets of life are becoming more closely associated with the city and its radiating influence in respect to our appreciation of nature and her inherent beauty.

The cemetery is associated with our religious beliefs and therefore is a reflection of the fundamental dogmas of our religious convictions. Our cultural heritage, embodied as it is in the history of many centuries contains the origin of the practices which we adhere to today in relation to the burial of the dead. In order to fully understand and appreciate the reasons for some of our burial customs as related to the design and development of cemeteries the landscape architect should have an understanding of the historical and cultural development of burial grounds before he attempts to design a cemetery.
Historical Background

Pre-historic

There is no data to refute the assumption that during the earlier stages of the evolution of humanity little or no attention was paid to the disposal of the dead. The deceased were simply abandoned by the wayside, like those of the lower animals. This practice was quite prevalent among some of the tribes of Australia as recently as 1924.¹ Some of the Mongolian tribes of a generation ago followed the practice of tossing their dead to the wild dogs of the forest who lived on nothing but human flesh. Burial of the dead is not necessarily a criterion of advanced civilization; the Seri Indians of the California Gulf, who were among the lowest of known savages, buried their dead.² Nevertheless, the disposal of the dead has occupied the minds of mankind since an early period in the evolvement of civilization.

Early man evidently had no fears of the dead but as he progressed toward civilization his attitude changed. Very early a fear of the dead developed. Demons and evil spirits, it was believed, caused the "long-sleep". Consequently, the

corpse was possessed with evil spirits and in order to prevent these from tormenting the living, the body, demons and all, had to be eliminated. This fear of the dead prompted primitive man to dispose of his dead by various means, sub-aerial disposal, cave deposit, water burial, earth burial and cremation were all used at some period.

The custom of burying the dead has been traced back to Neanderthal Man in the Middle Paleolithic Period.¹ Not only did the fear of the dead lead to burial but also to the marking of the grave so that it could be avoided by the living. The discovery of what is considered the first authentic Paleolithic sepulcher at Solutre in Southern France indicates that Cro-Magnon Man not only buried his dead but erected tombstones at the grave site as long as 15,000 years ago.²

The Iberian race which was distributed over Europe, Asia Minor and North Africa before the Aryans spread over this area, made great ceremonies out of the burial of the dead.³ By the time of the Neolithic Age there is unmistakable evidence to show that the disposal of the dead had become a sacred obligation.

The burial rites which were inspired by fear gradually evolved into ceremonies of pomp and solemnity planned espe-

¹Eichler, op. cit., p. 563.
²Ibid., p. 564.
³Ibid., p. 566.
cially for the dead. The burial customs of the Neolithic Period indicate a considerable mental development as shown by great burial caverns. The graves were lined with stone slabs on the bottom, sides, and top with great mounds of earth placed over the graves and surmounted by megaliths.

Cremation originated in the East among the Aryans as a consequence of their worship of Agni,\(^1\) the god of fire; however, it does not appear to have been universal among them. With the advancement of the Aryans into the territory of the Ancient Iberians, cremation made its appearance in the culture of pre-western civilization and has existed side by side with burial as a form of disposing of the corpse since its introduction.

Historio

The Ancient Assyrians and Babylonians, while acquainted with cremation, generally buried their dead in earthen jars in huge communal excavations. The early Egyptians also followed this practice but the Egyptian belief in immortality led to the practice of embalming the body so that the soul would have a resting place as it passed to and fro between the Kingdom of Osiris and the Valley of the Nile. Cremation was never practiced by the Egyptians.

From earliest time the Hebrews have held an extreme reverence for the corpse and never practiced either cremation or embalming. The Hebrews regarded the human body as composed of perishable clay and therefore favored burial. Their belief that the grave was ritually unclean led to the practice of erecting suitable tombstones so that it might be avoided by the priest. The ancient Greeks like the Hebrews considered the corpse unclean and during the early days, burial was the accepted method of disposal of the dead and was continued until about the third century B.C. when cremation was introduced.

The fundamental beliefs regarding death and funeral customs among the Romans were very similar to those of the Greeks. Like the Greeks, the Romans first practiced earth burial, but later resorted to cremation, which became the general practice in the later days of the Republic. The common practice of burning the dead in the Bronze Age was probably resorted to as a more effective way of getting rid of the ghost than by burial. Nevertheless, it was customary to perform a symbolic burial of the body by the interment of a small part of it, usually a part of one of the fingers.

Roman cemeteries were not public communal enclosures, set apart by themselves, such as ours are today, but were situated along the great highways leading from the cities. The fronts of these cemeteries bordered the road and took the form of long narrow private holdings with imposing monuments along the way. All the roads leading from the city of Rome
had their tombs; the most magnificent of all was the Appian Way. Portrait busts and the custom of roadside burial illustrated the Roman's yearning for continued participation in the affairs of the living and their conviction as to future existence. The tradition of burying the dead in close proximity to the living was followed by the Early Christians and has been continued until comparatively recent times.

The Early Christians adopted some of the Ancient Jewish burial customs which were fused with Greek and Roman customs but gave a spiritual interpretation to them. Early Christians conceived of death as a sleep and the grave as a resting place.¹ Their early burial places were outside the cities in natural caves or in tombs cut out of the rocky hillsides following the Jewish custom. Some of the earliest Christian cemeteries of which we have any knowledge are to be found in the vicinity of Rome. Prior to the Christian cemeteries of Rome the Early Christians made use of the catacombs of that city.

The catacombs had been used by the Romans as burial grounds prior to the Christian Era. With the advent of Christian persecution, the Christians made use of them as meeting places and burial grounds, because the Romans had a strong tradition of respect for all burial places, consequently, the Christians were comparatively safe. The catacombs of Rome

¹Hastings, op. cit., p. 456.
are 50 to 75 feet below the surface, so intricate and extensive in their corridors, passages and windings that they form an endless labyrinth. One authority had calculated that about seven million humans are buried there.¹

The rise of the Church changed the entire complexion of the burial problem. Very early the Church opposed the practice of cremation as pagan and followed the example set by the Divine Redeemer. By the fourth century A.D. cremation was entirely superseded by interment in the areas under the influence of Christianity. Toward the end of the second and beginning of the third century, Christians began to establish meeting places of their own above the ground for worship and also instituted burial places above and beneath the earth. Public burials in the adjoining church yard became the accepted practice because it was believed that the evil spirits which were contained in the corpse were rendered powerless in consecrated ground.

The development of the cemetery or church-yard appears to have had a slow and continuous growth. Burial elsewhere than in or near the domestic hearth, as had been the practice throughout most of the pagan world, would have developed as it did in most Islamic countries, independently of any new religious sanctions. However, the process was stimulated by the Christian practice. The Christian practice of burial

¹Eichler, op. cit., p. 586.
near the church led to enormous sanitary problems and finally resulted in 381 A.D. of Emperor Theodosius forbidding interment within the city of Rome and ordered the removal of all remains. Cemeteries, thereafter, were not permitted in or near the city. This law was followed through the Roman Empire and was embodied in the Justinian Code.\(^1\) The pagan practice of burying near the domestic hearth was so strong that the law was widely disregarded. From this time until comparatively modern times the practice of burial within the church became more and more common until the conditions within the churches became unbearable.

As long as the communities were small the disposal of the dead beyond the city limits caused little difficulty. Until relatively recent times, in Christian and non-Christian communities, the rule was to have the dead buried in close proximity to the living. Churches were built close to existing centers of population and the church-yard—"God's Acre"—was dedicated to the burial of the dead. Tombstones were almost unknown and the use of coffins exceptional, consequently the ground was used again and again.

The growth of urbanization resulted in greater concentrations of population, and existing burial grounds became inadequate. The growth of cities also forced cemeteries

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further away from the center of the town and public sentiment soon became adverse to burial in distant, not easily accessible, cemeteries on the outskirts of the cities. The conflict between intramural and extramural burials, which the Romans had so effectively solved was renewed and burial beyond the city limits was abandoned. The Christian church-yard frequently became a contracted plot of ground in the midst of dwellings, literally packed with bodies.

Before the eighteenth century few burial grounds existed other than those associated with existing churches and cathedrals. The old church-yard of Saint Andrew's, Widford, Hertfordshire, England was in continuous use for at least 900 years prior to its closing in 1903. The area available for burials was less than one-half acre in which it has been estimated 5,000 persons have been buried.¹

The great plague of London in 1665 focused attention to the sanitary dangers of the existing cemeteries and the practice of burying the dead. One of the earliest protests to intramural interment was published anonymously in 1721 under the title "Seasonable Considerations on the Indecent and Dangerous Custom of Burying in Churches and Church-yards"² but the pamphlet had no effect.

The dangers of the cemetery were also apparent on the

¹Ibid., p. 13.
²Ibid., p. 19.
Continent and the various governments took steps to prohibit intramural interment. The Parliament of Paris in 1765\(^1\) enacted a law requiring all churchyards within the city to be closed. Eight cemeteries were to be established beyond the city limits in which tombstones were prohibited—all epitaphs and inscriptions were to be placed on the enclosing stone walls. In 1785 the general disinterment was begun and the bodies transferred to the catacombs.

The extramural interment movement started in the United States about 1806 with the publication of the New York Board of Health Report which advised the removal of all grave-yards from the city and suggested that the space, thus created, be made into public parks.\(^2\) A subsequent law to prohibit intramural burial was passed but not enforced until 1823 when the epidemics of yellow fever and cholera convinced the people of the desirability of cemeteries beyond the city. Mount Auburn Cemetery in Boston, established in 1831, was the first detached cemetery in the United States. Other cemeteries soon followed: Laurel Hill in Philadelphia in 1840 and Greenwood in New York City in 1842.

Prior to this time and even long thereafter the American cemeteries were similar to those of Europe. Individual burial plots were established on farms and near the dwellings of the

\(^1\)Ibid., p. 20.
\(^2\)Ibid., p. 21.
earliest settlers. As churches were built the cemetery became associated with them, similar to the European practice; this practice is still followed in the rural areas today. Burial within churches in America was also practiced but was discontinued during the seventeenth and eighteenth century. The small town or village church-yard presented the same pictures as their European counterparts. Regular rows of mounds, crowded monuments of all descriptions, walled-in and fenced-in burial plots, square sections, an abundance of topiary work and little or no grass prevailed in all the cemeteries.

The development of the rural and suburban cemetery marked a new epoch in American cemetery design and burial customs. Old and well-established ideas began to be replaced and the resulting cemeteries prompted William Robinson of London in his book "The Parks of Paris" to say:

"The Americans are the only people who bury their dead decently and beautifully, that is, so far as the present mode of sepulchre will allow them. For beauty, extent, careful planting, picturesque views and keeping, the garden cemeteries formed within the past generation or so near all the principal American cities are a great advance upon anything of the kind in Europe. They are in some cases as large as national parks and as full of trees and flowers as a choice garden."  

The above statement was made in reference to Spring Grove Cemetery, Cincinnati, Ohio. Spring Grove prior to the

superintendship of Adolph Strauch was very similar to many cemeteries of the time, cluttered with tombstones, individual lot enclosures and grave mounds. Adolph Strauch, a landscape architect trained on the Continent and in England, arrived in America in 1851.¹ Under his artistic guidance and professional acumen Spring Grove was transformed into the model cemetery of the North American Continent.²

Mr. Strauch’s conception of a cemetery was that of a large park in which broad undulations of green turf, stately avenues and tasteful monuments intermingled with trees and shrubs would meet the eye in all directions. With a great deal of persistent persuasion he was eventually able to eliminate the individual lot enclosures, mounds and many of the tombstones and replace them with great expanses of lawns.

The Lawn Plan, as this type of cemetery development was called, influenced cemetery planning all over the country and produced a decided improvement in the esthetic appearance of new and old cemeteries. Mr. Strauch’s ideal of only one monument per lot, however, was not achieved. The general design of cemeteries remained similar to the old established pattern of rigid checker-board subdivisions. The curvilinear road


²See Figure 1, p. 20.
Figure 1. Road map of Spring Grove Cemetery, Cincinnati, Ohio (Map furnished by G. Clyde Gordon, Superintendent)
system Mr. Strauch advocated was accepted in principle but in practice the angular road system prevailed. Mr. Strauch's contribution to cemetery design was enormous and won for him the fitting title "Father of the Lawn Plan Cemetery". Cemeteries became park like in respect to trees, shrubs and lawns even though they still abounded in monuments and tombstones of all designs and descriptions.

There seems to have been little inclination to change the general pattern of our burial grounds until after the establishment of Forest Lawn Cemetery, in California, in 1917.¹ The philosophy of the founder of this cemetery was that a cemetery should portray life rather than death. He conceived the cemetery as a memorial park designed as a humanized but naturalistic park, devoid of the usual type of monuments and tombstones. Individual memorialization was restricted to markers placed flush with the ground. Well designed roads, walks, sweeping lawns, trees and shrubs were the basis for the landscape development with noble memorial architecture, statuary and fountains used to complete and enhance the landscape.

This first real change in the basic pattern of cemeteries met with enthusiastic approval and filled a hitherto undetected need. The esthetic possibilities of this type of cemetery were recognized by cemetery officials and designers. In less

¹See Figure 2, p. 23.
than a generation the idea spread across the country; however its enthusiastic acceptance and rapid spread resulted in detrimental after effects.

As the memorial park idea was developed across the country it resulted in a plain park-like area and in many cases it took on the appearance of a purely naturalistic park, devoid of the historic cemetery atmosphere and therefore, without appeal to the public. The various sections differed only in name—they had a monotonous sameness because the developers were unable, financially, to erect the noble memorial architecture, statuary and other works of art, which were so abundant in the first memorial park. The public still retained the age old custom of desiring some form of monument or memorialization. In order to relieve the plainness of the statueless memorial park, the garden plan was originated.

The garden plan was first developed in 1939 with the intention of relieving the monotonousness of the huge areas within the memorial park by introducing a garden in place of the lacking architecture or sculptural feature of the section. The garden concept in cemetery planning is similar to the garden in other landscape compositions, in that it becomes an intimate enclosure subordinated to the over-all design of the surrounding area.

Gardens as developed in some of the recent cemeteries are generally executed in a formal manner either partially or completely enclosed, with the enclosure planting designed in
Figure 2. Pictorial map of Forest Lawn, Glendale, California
(Map supplied by the cemetery)
such a manner as to effectively bridge the union of formalistic and naturalistic and thus maintain the esthetic, progressive spirit of the memorial park.

Our present day sophistication in the development of cemeteries has been built on the history and the advancing culture of mankind. The fundamental ideas are as basic today as they have been in the past. The expansion and ramification of these fundamental burial customs can only be achieved by a knowledge of what has been accomplished in the past and then related to our present day concepts of life and the method of expressing our twentieth century culture.

Cemetery an Expression of Culture

Practically all phases of human activity are directly or indirectly associated with the cemetery. Cemeteries are the final resting place of the body and as such they become important expressions of the activities of the living. The daily activities of our civilization are influenced by the developing and changing aspects of our society which in turn are reflected in the cemetery and our method of disposing of the corpse. The methods employed to express our religious beliefs and our economic needs and desires as well as our concept for the memorialization of our dead are all culturally defined.
Religion

The most significant aspect of our culture which is reflected in our cemeteries is our religious beliefs, which dominate our expressions of memorialization and our esthetic standards. Recent advances in cemetery management have also brought the cemetery into the realm of the business world; nevertheless, in order to build a successful operation, the cemetery while divorced from the church in many instances is still developed and operated on the basis of religious ethics.

The cemetery as known in the United States has always been associated with the Christian faith. There are no institutions except the churches themselves which reflect in a greater degree the faith and religious life of our country than do our cemeteries. Whether it is a small church burying ground, or a large privately owned memorial park, a cemetery has a unique religious function in the community it serves.

The belief in the resurrection of the body has led to the desire to preserve the corpse and to make the final resting place of the body a place of beauty and serenity. The majority of life's most precious memories eventually become associated with some particular cemetery. At first these memories led to the memorialization of individuals and took the form of individual grave stones, or large more imposing forms of stone work. As our culture became more sophisticated the emphasis shifted from individual memorialization to our present concept
of the memorial park, wherein the entire cemetery becomes a memorial to those people buried there, with little or no personal memorialization.

**Cemetery as a memorial**

The United States Military Cemeteries, particularly those established after World War I and since that time, have greatly influenced this contemporary concept of cemetery development. The World War I Military Cemeteries in Europe were conceived of as both memorials and burial places and developed in accordance with clearly defined principles based on classical simplicity.¹ These principles were embodied in a set of master plans which prescribed memorial and utilitarian features, landscape planting, space utilization and access roads.

The majority of the Civil War Cemeteries were originally planned as simple burial places without any regard to the memorial aspects; however there are some notable exceptions to this statement. The most outstanding is the cemetery established in commemoration of the Battle of Chattanooga, November 23-27, 1863. This cemetery site was selected by Major General George H. Thomas, who took advantage of the pause in the war at Chattanooga to put his impression on one of the most beautiful cemeteries in the National System. According to Chaplain T. B. Van Horn, who acted as superintendent during the forma-

¹See Figure 3, p. 27.
Figure 3. World War I Military Cemetery, Argonne Cemetery, France (Photograph by P. H. Elwood, Landscape Architect)
tive period of development, General Thomas selected the site during the assault of his troops, which carried Missionary Ridge and brought the campaign to a victorious end. The 75 acre cemetery consists of a round hill, rising with a uniform slope to a height of 100 feet. The hill stands within a natural amphitheater of magnificent proportions, inclosed on one side by Missionary Ridge and on the other by Lookout Mountain.

The plan of laying out the grounds was suggested by the undulating terrain. Chaplain Van Horn reported in May 1865:

Where nature suggested avenues they have been made and their curves define the sections. This rule has determined the form and size of the sections. It has given marked individuality to each, and has allowed a well-sustained unity of expression to the whole, as nature has nowhere been opposed.¹

Through the years the Civil War Cemeteries have been transformed into memorials commemorating great battles and honoring the soldier dead buried in them.

The memorial aspects conferred on National Cemeteries, largely by reason of their location, came to be regarded in the minds of thousands of visitors as the proper type of development for all cemeteries. This ideal of memorialization of the cemetery, naturally developed a keener sense and a demand for an improvement in respect to the esthetic qualities of the cemetery with regard to landscape treatment and

memorial art.

Memorial park

The restrained, artistic development of Forest Lawn in California, the leading memorial park cemetery in the United States, has greatly influenced and raised the standards of esthetic expression in our cemeteries. As the communities standards of beauty became more refined, the cluttered monument cemetery with its tombstones of all sizes and shapes located without regard to comprehensive unity became more repulsive. A tombstone or monument, if artistically designed, skillfully executed and provided with the proper setting, becomes a work of art and is always interesting and appealing to one’s sense of beauty and appreciation of the handiwork of man. It is toward this goal that lot restrictions in respect to memorials and private plantings are directed, thus eliminating from newer developments the blight of indiscriminate monument placement.

The modern cemetery contains few signs and symbols of death but instead depicts death in surroundings of beauty that are symbolical of the calm and peace of the life hereafter. Everything has been done to make us forget death itself. All details have been carefully worked out; the symbols have been chosen to express life and hope. The atmosphere of the memorial park presents in every respect the beauty of a public park as well as the peace and quiet of after-life, rather
than the grief and sadness of those bereaved.¹

Financial aspects

The development of cemeteries as in other forms of commercial landscape development differ slightly from those areas in which the financial aspects are not as prominent. In the development of an estate or large private holding the consideration of beauty and the esthetic potential are developed and largely justified on this consideration alone. In the cemetery while the landscape architect is constantly striving to develop the esthetic possibilities of the area, he is also conscious of the fact that all decisions must be made with the idea that the development must produce a fair profit for all money spent in its creation or improvement. The economic potential of a cemetery becomes as important as its esthetic potential. The landscape development has an impressive influence on the financial success of a cemetery. The three basic services the cemetery offers to the public are burial space, beauty and continual care and maintenance.

Burial space is the most important service and the initiating cause of the entire development, the one that justifies the establishment of the cemetery. Beauty and perpetual care are, therefore, secondary in consideration. The desirability of the burial space, thus created, is dependent upon

¹See Figure 4, p. 32.
Figure 4. Sunset Memorial Park, Annville, Pennsylvania
(Photograph by the author)
the size of the lot, its proximity to the entrance, the ease of access by roads and walks and the unobnoxiousness of adjoining lot development. Social prestige of the lot also influences the price obtainable for the grave areas.

Cemeteries are generally developed with three classes or types of burial spaces, high cost, medium cost and low cost lots. While this classification may indicate a reduction in the amount of services rendered and concessions as to desirability in respect to access and definitely in the social aspects of the lot, it should never indicate a reduction in sound landscape development and perpetual care.

The high cost lot sections can be developed from the point of view that the purchaser can afford to pay, not only for the absolute essentials but for the added conveniences, beauty and prestige. These sections should, therefore, be planned as the areas in which the cemetery will spend the greatest amounts of time and money to give distinction and character to its development. Greater unity in the cemetery can be secured if these sections are located throughout the development rather than concentrated in one or several locations.

At the other end of the economic scale are the low cost lots, characterized by a low purchase price and low annual maintenance. The accommodations provided are at a minimum consistent with health regulations, self-respect and efficiency of maintenance. The beauty developed here must be in harmony with the over-all development of the cemetery.
The medium cost lots are naturally a compromise between these two extremes and account for the greatest percentage of the cemetery area.

Various priced lots are a necessary part of any successful cemetery desiring to fulfill the needs of the community in which it is located. Therefore, these lots must be provided for in the initial studies of the design, rather than merely added after the desirable locations have all been designed as high-priced sections. Oftentimes, through ingenious planning, seemingly undesirable areas can be developed into high prestige areas, thereby creating greater beauty throughout the entire cemetery and consequently raising the esthetic qualities of the medium and low priced lot sections.

The net income of a cemetery is seldom commensurate with the expense of development during the early years of operation. The volume of sales increases and the lot prices rise to nearly peak levels after the initial development period. The business cycle of the new cemetery can be divided into three phases: the initial phase, optimum period of efficiency and profit, and the endowment phase. During the initial period grave spaces are sold at moderate rates to stimulate buying and to establish a reputation for subsequent public recognition. The expenses for promotion and development are

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most pronounced during this period; furthermore the endowment fund proceeds are insufficient at this stage to materially ease the burden of maintenance care. The length of this unprofitable interval depends upon the size of the project. The next two-fourths of the cemetery's active life reflects the optimum period of financial return. Considerable parts of the cemetery project have been developed and the esthetic features have been established. The endowment period is a period of administration and maintenance; no longer is there a need for lot selling campaigns and subtle, effective advertising. The endowment fund has increased sufficiently to assure an adequate yield for current and perpetual care.

Preservation of Existing Beauty

The type of beauty to be created or preserved is a decision that must be made before the scheme of the cemetery can be decided upon. Any landscape project that deserves an investment for landscape development also deserves special consideration as to its individuality, as a completely different landscape. Successful landscape development should first of all be functional, both in use and contoural factors, and its pictorial quality planned to enhance these features.

Hubbard and Kimball in their book "An Introduction to the Study of Landscape Design", while discussing the subject of land subdivision for housing projects have made the following statement in regard to preserving or creating beauty:
If there exists considerable natural beauty of pleasant hillside and great trees, and if the lots may be made large enough so that the natural surface of the ground may be to a great extent preserved, then there may be chosen a development of winding roads, of informal planting, of lots so arranged that the lot units and the landscape units coincide as far as may be possible, and the house locations may be so taken as to do the minimum of damage to the natural landscape. If this kind of beauty does not naturally exist, it may nevertheless be chosen as a type to be approximated in the new development.... If however, ... no broad naturalistic effect is possible, then the beauty of harmonious but diversified houses, of tree-shaded streets, with pleasant curves or with pleasantly broken straights, a beauty consisting largely in a general air of decency and well being. This must be provided for in the design, but can be maintained only by properly enforced restrictions and particularly by a proper community self-respect among the lot owners.1

These comments are as applicable to the cemetery as to land subdivision and in great part guide the cemetery developers and the designers in arriving at the proper decision in respect to the character to be developed in the cemetery.

The Cemetery an Integral Part of City Planning

Like all other physical elements of the city, the cemetery must be provided for and given consideration as to location and size so that the proposed location does not interfere with or, better still, is one which aids a good and logical development of the city.

For the purposes of this thesis it will be assumed that

the required studies relative to the necessity of establishing a new cemetery have been carried out and answers obtained to the following questions pertaining to cemetery requirements:

1. How many burials will there be during the next "x" years?
2. How many burials can be taken care of in existing cemeteries?
3. How much new cemetery land will be required?

The allocation of areas for cemeteries must be considered an integral and functional part of general city planning. Cemeteries cannot be considered apart from the uses of land for streets and transportation, for housing, for the probable growth and movement of population, the location of industrial and commercial establishments, the location of public institutions and the location of parks and parkways.

In urban land use statistical summaries, cemeteries are rarely listed separately. They are normally included under "semi-public open spaces". The significance of this grouping is that the cemetery serves as an open space and is therefore, a benefit to the city. Since it is our expressed hope to have our cemeteries resemble parks it is only logical that they should form an integral part of the park system in location and distribution.

Our memorial parks have many of the attributes of a public park, and from some points of view they perform some of
the functions of a park. They admit sunlight and air, provide places for people to walk about and rest, and furnish many pleasant landscape features in the form of lawns, flowers, shrubs, trees and vistas. Some of the public cemeteries throughout the country, in point of landscape beauty, rival the most beautiful of landscaped public parks.

In communities where cemeteries are located on the periphery of the urban development, the cemetery can be an asset in civic design and become a type of land use in the greenbelt concept of city planning. In order for the greenbelt theory to function the area allotted to the greenbelt must be held under public or semi-public control, in land uses such as cemeteries, golf courses or parks which can become relatively permanent land uses.

In determining the location of the new cemetery a thorough study of the transportation situation of the community is necessarily involved. The cemetery should be located so as not to interfere with the opening of future streets and not to obstruct the location of arterial routes. If it is absolutely necessary to locate a proposed throughfare through the cemetery, a liberal, limited access right-of-way should be reserved for the eventual traffic artery. To minimize interference with unforeseen additions to the throughfare network, the cemetery should be rectangular in shape rather than square. If the long axis of the rectangle is placed parallel to radiating arterials, the possibility of eventual interference will
be lessened. If the cemetery is large, it is well to dedicate right-of-ways for streets in accordance with the proposed major street plan, even though they may never be used. Ample reservation for future street widening should be made along all boundaries. In reserving areas for future streets or for the future widening of streets, widths considerably in excess of those used at the time the cemetery is established should be provided.

The distance the cemetery is from the people to be served is more or less a relative matter. Approximately 40 years ago it was thought that access by public transportation was necessary.¹ This meant at least street car access for the urban cemetery; however, with the advent of the automobile this is no longer true. The cemetery should have access by way of principal thoroughfares, although the cemetery need not be adjacent to the major street.

A cemetery 20 miles from a city with access by way of parkways or freeways would be as accessible as another property 10 miles from the city but reached only by an ordinary traffic route. Due regard should, therefore, be given to the question of existing transportation facilities or to the possibility of securing high-speed access in the immediate future before the location of the cemetery is determined.

The direction in which the city is growing most certainly has a direct relationship to the location of the cemetery. The land use plan of the city frequently controls their placement. Commercial or industrial zones are very poor locations because dust and gases in these areas may have a detrimental effect on the vegetation in the cemetery, plus the fact that the emotional attitude of the public is adverse to their placement in these zones. Residential or rural areas are the most suitable locations for the cemetery.

The effect of cemeteries on adjacent property values has never been determined; however, if the cemetery is developed in the memorial park style and provided with the proper safeguards of screening and land use it is logical to assume that they would have the same effect, that of raising property values, as do parks and other public open spaces.

Physical Elements of the Cemetery

The physical elements to be accommodated in a cemetery vary with respect to the size and type of development contemplated. The following list includes all of these various elements associated with the most elaborate cemetery. The individual aspects of these elements and the factors associated with them will be discussed in detail in the following section which gives consideration to: the site and its physical character--the topographic survey--the entrance--circulation--grading--subdivision of the cemetery--water supply and
drainage—cemetery structures—monuments and memorial sculpture and landscape planting. Let us proceed to consider the methods of arranging these elements in the design of cemeteries.
ELEMENTS INVOLVED IN DESIGN AND THEIR RELATIONSHIP TO THE COMPOSITION OF THE CEMETERY PLAN

Careful consideration should be given to landscape design because it constitutes an important part of cemetery planning. It is evident that in determining the design of the cemetery all the general considerations previously mentioned must be taken into account. Design is an arranging of the elements of which anything is composed, to serve a functional use and give pleasurable reactions. The best design will not be produced until the most effective compromise has been reached between the conflicting factors of beauty, efficiency and financial return.

The considerations which are inherent in these elements of design are closely allied with the considerations governing the actual process of design. It therefore becomes advisable to discuss these elements together in respect to the esthetic effect they will produce and their functional use in the design. None of these elements can be thought of as a separate entity; they are all interrelated and dependent upon each other. It is therefore believed that the best way to present this aspect of cemetery design and thereby give some indication of their relative importance in the design process is to begin the discussion with the undeveloped tract of land and gradually proceed toward the point where all of the elements are assembled in a composition referred to as the cemetery plan.
The Site and its Physical Character

The boundaries

The shape of the tract and its topographical features are controlling influences in the eventual design and character of the cemetery. From the city planners' point of view the rectangular shaped property is preferable to the square property. This same conviction is held by the landscape architect, but for quite a different reason. To the designer a rectangular or an irregularly shaped piece of property offers more opportunity for an interesting, individual design than does a square or nearly square tract of land. This, however, does not mean that a successful and interesting design cannot be evolved within a square shape. The landscape architect's ability and ingenuity must exert themselves in either case if the most satisfactory solution obtainable is desired.

Care should be exercised to secure the whole of any topographical feature. If there is a lake, stream, or hill, the entire area in which the feature occurs should be secured and not merely a part of it. At the same time special consideration should be given to the fixing of the boundaries. If the property selected is within an area already platted, the boundaries should extend to the streets; if in the vicinity of a roadway, entirely to the road and if along a river or lake, the entire bank of the water course should be secured.
Topography

Whenever the contour of the site suggests an opportunity for developing lakes or taking advantage of existing lakes and streams, they should be capitalized upon since nothing adds more interest to landscape beauty than does water. In contemplating the development of lakes and other water features, care must be exercised to make certain that the water supply will be sufficient and that the subsoil is suitable for the retention of water in the proposed lake.

The contoural formation of the area should have careful attention. A gently rolling tract lends itself more readily to the best landscape effects and to a more artistic expression in the naturalistic style than does a flat piece of ground. However, the term naturalistic style must be considered as relative and be translated into the natural landscape of the area in which the cemetery is located. Honesty of expression must guide the designer; rolling hills would be as incongruent in the desert country as a perfectly level plane would be in the mountainous areas. Where flat landscapes are typical it is the landscape architect's problem to produce a design which emphasizes the particular beauty of this type of landscape.

Gently rolling land, however, is preferable and should be obtained whenever possible. Flat land is undesirable both on account of poor drainage and poor landscape effects. There
is a sameness about flat land which cannot be fully overcome by landscape planting, whereas the gently curved drives winding around the elevated sections on a hilly site add interest and enhance the pictorial quality of the cemetery.

In more rugged terrain gentle hills and valleys may be developed artificially in semblance of the natural forms, but unless handled with detailed care and knowledge of ground forms the deception will be apparent and not worth the expense involved.

Hilly and rugged locations are not as objectionable today as they were at one time. The increase in cremation and the subsequent burial of cremation remains has reduced the required size of the grave spaces, and consequently the necessity for comparatively large areas of relatively even-sloped land. Section widths may also reflect this new trend and be extended beyond the present width of 300 feet, thus reducing the number of roads.

The expense of roads and grading may be more on a hilly area than on a flat area but the saving in the initial cost of the land and the advantage of a strategic location may more than compensate for the added cost of development and maintenance. Nevertheless, the inconvenience and excessive cost of maintenance on very hilly ground is a serious problem and should be avoided as far as possible.

Through the years the public has come to develop a preference for cemeteries built on the higher elevations.
It is, therefore, preferable to have the majority of the area higher than the logical entrance point. In all cases of sloping ground, preference should be given to the sunny slopes, where the ground will be more free from snow and frost in winter than on the north slopes.

Soil

The soil should be one that is suitable for the growth of trees, shrubs and other plants as well as lawn grasses. The best type of topsoil is a sandy loam rather than a heavy clay or gravel. Such a soil is easily handled in grave digging. A sandy loam soil practically drains itself and it is fertile enough for the establishment of a fine turf. A good lawn is essential to the landscape planting of the cemetery and all necessary measures should be taken to develop a topsoil capable of producing a fine grass cover.

The subsoil is quite as important as the topsoil because of the ease in excavating and drainage. Soils with a stony stratum near the surface obviously are undesirable because of the difficulty involved in grave digging. The subsoil should be sufficiently solid to prevent caving but not so hard as to be expensive to handle or so impervious as to retain excessive amounts of water. Good drainage to a depth of 6 to 7 feet is very desirable although the lack of it can be corrected without prohibitive costs.
Native vegetation

The desirability or undesirability of considerable native vegetation upon the land selected for the cemetery is a relative one. Undoubtedly, a more perfect landscape result can be achieved in the end if there is no native growth to interfere with roads, grading, and planting composition. However, it requires years for new planting to mature to the point of producing significant landscape effects and for this reason a reasonable amount of native timber is desirable. Several groups or specimens of well developed trees will do a great deal to give a setting and finish to the new plantings and to form a background for vistas and a foreground to distant views.

Topographical Survey

A detailed accurate record in the form of a topographic survey of the site selected is absolutely essential to the designer. Upon the accuracy of this plat depends the accuracy of the resulting plan prepared by the landscape architect.

Required data

The information that should be recorded on the topographical map should include an accurate boundary survey, giving the legal description of the property, lengths of all sides, the angles and description of any curves. The conformation of the ground should be shown by contours accu-
rately platted from a sufficient number of elevations, with the ridge and valley lines indicated. Contour intervals of 5 feet are usually sufficient in cemetery work, although a smaller interval may be used on more level ground. The location, condition, name and size of all native trees should be recorded, except in cases where the land is well wooded and the loss of trees in any particular location would not be of any importance. In these cases the tree masses may be outlined, but large trees, which are of particular value, should always be noted and located. Groups of native shrubbery or plants typical of the various portions of the area, soil conditions, rock outcrops and the location and elevation of springs, streams and lakes are all necessary information.1

Method of surveying

The method most frequently used in preparing the topographical survey is the one known as cross-sectioning. While the stadia method is much easier and quicker, it is subject to a greater degree of inaccuracies and no definite points from which to take further notes are left on the ground. However, if the cemetery is to be laid out by professional people rather than unskilled cemetery labor the necessity for these permanent ground markers is much less. If the survey is run

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1Sid J. Hare and Herbert S. Hare. Planning and design. In Cemetery Handbook. Chicago, Ill., Allied Arts Publishing Co. [ca. 1921]. p. 16.
carefully the stadia method can produce as accurate a topographical map as the cross-section method.

In the cross-section method the land is divided into squares parallel and at right angles to one property line with stakes set at even distances each way. The usual size of these squares is 100 feet. Elevations can then be taken with a level at these points, at the ridge and valley lines and at any other breaks in the grade between the stakes. Chances for inaccuracy are obviously very small and the work is easily checked. It is desirable to have at least every third or fourth stake an iron rod set in concrete, so that the location cannot be lost. Practically the entire future development of the cemetery can be based upon the original stations. Trees, rock and other features can be readily located from these stations and when the roads and lots are platted they can be related to these points.

Scale

The scale of the topographical plat will depend upon the extent of the grounds, and may vary from 20 to 100 feet to the inch. Forty feet to the inch is a convenient scale for cemeteries of medium size—40 to 60 acres.¹

¹Ibid., p. 17.
Site visitation

The assured accuracy of the topographical survey and the resulting plat does not exclude the necessity for the landscape architect to personally visit the site. Many mental notes of conditions and opportunities, which would be difficult to record on the plat, but which are, nevertheless, of extreme value in designing will be noted by the landscape architect in his personal visits to the site. The opportunities for views and vistas, either distant or within the grounds, which should be preserved or opened as well as those which should be screened, cannot be evaluated by any other means than by actual study on the site.

The Entrance

Today's traffic presents a major cemetery problem which is certain to become more acute in the future. The planning of an entrance must acknowledge this problem and provide an adequate solution to it. For purely psychological reasons the entrance should be located so that the greater portion of the cemetery will be above it. Whenever possible the road should lead up and into the cemetery rather than down and into it. Elevation is a comparative matter and by lowering the point of entrance the rest of the ground seems, in effect, to be higher.
Location

In selecting the entrance site consideration must be given to public transportation facilities, should such conveniences be present and also to the accessibility to the public highway. It should therefore be located at the point most convenient to most of the traffic, on the side toward the city or the main highway. In the past it was considered desirable to have street car lines service the cemetery entrance but this consideration is of no major concern today.

The point of entrance must be determined first and has an important bearing on the design and alignment of the major road system. Future possible entrances should be considered as they will govern certain details in the entire road system; however, the number of entrances should be limited to as few as possible—preferably to one. The control of traffic will be greatly simplified if all incoming and outgoing traffic must pass through the same entrance.

The distance the gate should be off of the highway is a question of safety and practicability. The type of development, the terrain and the esthetic effects desired also have a relationship to the distance the entrance should be set back. Results of the questionnaire showed that superintendents considered a range of from 10 to 100 feet adequate.1 Since

1See Entrance set-back, Figure 18, Appendix B, p. 171.
the location of the entrance is a question of design, arbitrary distances cannot be established. The most practical thing that can be done is to locate the entrance in relation to the over-all design of the cemetery, keeping in mind the function it must serve and thereby satisfying the need of access to the elements both within and outside of the cemetery.

Approach

No feature of the cemetery will attract as much attention as the entrance. This fact should be recognized and every opportunity to create a favorable first impression should be developed. The component elements of the main entrance are roadway, paths, architecture and planting, all of which in varying combinations allow considerable ramifications of design.

Basically the entrance, the gate and the architectural features should be located far enough back from the highway to allow for an open, spacious treatment and a wide, curved approach. In all instances, the entrance should be so developed as to afford adequate visibility in both directions. The width of it is dependent upon the type of treatment and the effect desired, both must be kept in scale with the rest of the development.

The entrance road may be wide or narrow, or it may be divided into two parallel ways, however, under no conditions should it be less than two lanes in width. The road for the
main entrance may come into the cemetery straight or at right angles to the highway upon which the cemetery abuts, or it may come in at an acute angle, but the angle must not be so acute as to interfere with traffic or to spoil the desired landscape effect.¹

Acceleration and deceleration lanes

The entrance and access road must be so designed to accommodate the great amount of traffic, traveling at faster speeds on our highways. The desirability or necessity for acceleration and deceleration lanes at the entrance is an individual problem. It can only be resolved after a study of existing and future conditions at the cemetery entrance have been explored. The design speed of the abutting highway, the number of funerals and other vehicular traffic entering the grounds daily and the length of the main approach road all have an influence on the flow of traffic about the entrance.

Cemeteries adjacent to high-speed freeways or heavily traveled highways could drastically reduce the traffic hazard by the use of acceleration and deceleration lanes. The questionnaire showed 78 per cent of those expressing an opinion, to the question on the desirability of such traffic lanes as favoring them and considering them necessary. Only 23 per

¹See Figure 5, p. 54.
Figure 5. Treatment of the approach drive
cent of those answering the question felt such lanes were unnecessary. As has been mentioned before, the location of the cemetery has a great influence on the necessity or desirability of acceleration and deceleration lanes. This is affirmed in the answers to the questionnaire; those considering them unnecessary were not faced with traffic problems on high-speed highways.

The length of acceleration and deceleration lanes is dependent upon the design speed of the highway and the design speed of the entrance turns.

pedestrian circulation

Not only should vehicular traffic be considered in the design of the entrance but also pedestrian traffic must be provided for in the development. A single walk or, for that matter, more than one may parallel the road, or in cases where a more convenient walk may be provided elsewhere, the walk along the main road may be eliminated.

Architecture of the entrance

While vehicular and pedestrian traffic controls are major considerations in the functional design of an entrance, the architectural features to a great extent set the scale and

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1 See Desirability of acceleration and deceleration lanes, Figure 18, Appendix B, p. 171.
2 See Figure 6, p. 56.
Figure 6. Table of acceleration lane and deceleration lane (Adapted from Elwyn E. Seeleye, Data book for civil engineers. Vol. I, Design. New York, N.Y.: John Wiley and Sons, Inc. 1951.)

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style of the entrance. The architecture of the entrance may consist of gates, piers and some of the buildings normally required in a cemetery such as office and administration quarters. Whether these buildings are placed immediately inside the entrance, made a part of the entrance structure, or placed well within the property is a decision to be made by the designer. In cases where they are visible or a part of the entrance, all entrance structures should be harmonious, consistent and appropriate in scale, style, ornament and general workmanship so as to produce a unified composition. Whatever the treatment chosen, it is better to have it too massive than too small in effect.

The placement of buildings in conjunction with the entrance also creates a problem of parking. The parking spaces should be provided as conveniently to the buildings served as possible. Whenever it is desirable to have the administration building a part or close to the entrance, the parking problem must be handled in such a manner so as not to interfere with the flow of traffic through the entrance.

Entrance planting

As much care should be given to the choice and location of plant materials used at the entrance as to the architectural treatment. Nothing detracts from a dignified and inviting entrance more than a cluttered and inharmonious collection of plants.
Minor entrances

In large, extensive grounds the desirability of more than one entrance often becomes a necessity. Minor entrances to large cemeteries may serve as exits or as convenient entrances to points of interest. Nevertheless, they should be developed so as not to compete with the main entrance in importance. They can be successfully treated in a naturalistic style, with some architectural effects in the form of pillars or gateways and not invite unnecessary use.

Circulation

One of the first considerations in designing a cemetery is circulation. Lots would be of little or no value without ready access. Circulation, naturally, falls into major arteries which carry the bulk of the traffic and minor roads which provide access to the remainder of the ground.

Esthetic effects

Different types of road systems will produce characteristically different esthetic effects, which must be considered in relation to the desired character of the cemetery. A curvilinear system fits and expresses variations of topography while a gridiron system results in regularity which may become monotonous.

Some of the effects a cemetery may have will be due to
the views axially along the roads. Distinct esthetic advantages will, in all probability, be gained from a curvilinear road system which provides straight streets of reasonable length giving good axial views of interesting objects, such as chapels and monuments. Major interruptions of road continuity in this way will be a burden upon traffic, but sometimes an irregular topography may be developed to great advantage with a road system of short straight roads, fitting the topography practically as well as a curved system.

Long sweeping curves are preferable from both the practical and the esthetic point of view. Sharp curves and especially sharp reverse curves are hazardous to smooth traffic flow. Curves appear sharper on the ground than in plan. The appearance and the psychological impression should always determine the degree of curvature rather than the engineering exactness of the curve.

On level land, curving roads are more interesting and more beautiful than straight ones. However, if conditions force or strongly suggest the use of a straight road, there is no rule of good taste that should prevent its use. If there are no obstacles in the path of the road it should be allowed to run straight or only slightly curved. Nevertheless, if this rule were followed through a cemetery, monotony would almost certainly follow. It is often, therefore, desirable to create obstacles such as planting or architectural features which dictate and justify a curve in the road.
Adjustment to topography

Where the roads are laid out on hills the roads should be designed so as to have the least possible gradient and at the same time the least possible cut and fill. Necessary cuts and fills should simulate the natural surface wherever possible. Where there is considerable natural beauty in the form of hills, valleys and trees, and particularly where the hills are small and irregular, a system of curving roads taking advantage of the topography will be more appropriate and more pleasing and certainly much cheaper than a gridiron system.

In areas where the slopes are large and simple and the natural slope is not greater than the desirable maximum gradient of the road, the road system may be laid out with one set of roads parallel to the contours and the other at right angles to them. In any case the roads should lie as nearly as possible upon the natural surface. Roads carefully adjusted to the topography result in great saving in the cost of grading and if carefully designed in both plan and profile will produce the most pleasing results. It is useless to design a beautiful curve in plan if the profile of it when adjusted to the ground will be inappropriate or ugly in appearance.

Where roads run along a hillside it should be remembered

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1See Figure 7, p. 62.
Figure 7. Sunset Memorial Park, Annville, Pennsylvania
(Photograph by the author)
that it is commonly considered a disadvantage to go down into a lot from the road. The road should, therefore, be kept back from the brow of the hillside.

Alignment

In a general way the road system should develop into a series of loops, making easy returns to the entrance, and for this reason all possible future entrance points should be considered in its design. The junction of the interior road system with the entrance drive is a matter of design. The distance the entrance drive should extend into the cemetery before it branches into other roads is dependent upon the type of development.¹ The main consideration in this respect is that it must not divide before it has passed the administration building.

Providing burial space is the primary purpose of cemetery development and the road system provides the access to these grave sites. This however should not be the only consideration in designing a road system. The use of the cemetery area for other uses such as passive and active recreation areas after its function as a burial ground is completed should be considered and the major road system designed and constructed in such a manner that it will serve both functions without

¹See Length of main drive before branching, Figure 18, Appendix B, p. 171.
Surfacing material

Road surfacing materials vary with the part of the country in which the cemetery is located. The desirability of quiet colors in road materials is as important in the cemetery as in the park. Asphalt and bound macadam are, therefore, preferable to concrete which is too severe, cold and glaring.

Major roads

The major or arterial road system is the framework of the cemetery circulation system, and the design and the plotting of it should be prior to that of the minor roads. The location of such important architectural features as the crematory, receiving vault, chapel and cemetery sculpture have an influence on the location of the roads in the system. The arterial roads should be laid out so that the chief points of interest and the most noteworthy features in the cemetery may be reached by the most direct route. Natural features such as streams, lakes and views will dictate the major road pattern to a certain extent because these will become features and should therefore be given easy access. However, the architectural features do not impose the same restrictions, since their location and the road alignment may be adjusted so as to compliment each other.
The arterial road system should be designed for the entire property even though not all of it will be developed at the same time. If the major road system is to function efficiently it must be conceived of as a unifying element; therefore, the problem of future expansion must be given adequate consideration in the initial development studies.

The importance of apparent elevation in the cemetery has been discussed before. The placement of the major roads in the low portions, wherever practical, is advantageous in creating this illusion of elevation. This same principle should also be followed with the minor roads but it is not as important on these; the comprehensive impression of the cemetery is secured on the arterial roads.

Road widths. The width of major roads, of necessity, will be greater than other roads because of their increased traffic load. The immediate traffic load, however, is not the only consideration, further widening will also have to be considered in determining the right-of-way to be set aside. As long as the cemetery is functioning as a burial ground the original road widths, in all probability, will be sufficient, but in the future as the cemetery takes on other functions these roads may prove inadequate and additional lanes will be necessary. Provision must be made for such additions in the original plan and before any grave spaces along the road are sold.

Data secured from the questionnaire indicates that major
roads wide enough to allow for three lanes of traffic or 30 feet is sufficient for cemetery purposes.\textsuperscript{1} Three traffic lanes allow for parallel parking on one side and two lanes for moving traffic. Besides the paved surface the right-of-way must include space for storm sewers, water mains and planting. Present planning allows for a uniform planting and utility strip of 3 to 5 feet along each side of the road. The width of these strips must be sufficient to accommodate the sewer and water mains; however, a uniform strip along the entire road seems to be unnecessary. The planting that will be done in these planting areas must be related to the over-all planting composition. Therefore, a planting strip of various widths, broader where necessary to accommodate planting and only of sufficient width in other areas to place the service lines should be provided. Such an arrangement is ideal in cemeteries where no above-ground tombstones are permitted. In monument cemeteries this irregular planting strip may present a problem because of the monument alignment.

\textbf{Curbs and gutters.} Major roads, except entrance roads, are frequently built without curb and gutter installations. There are two reasons for this policy, expense and the conception that the road should be kept as inconspicuous as possible. Curbs and gutters naturally will raise the expense involved in the construction of the major road system but this expense

\textsuperscript{1}See Width of road, Figure 18, Appendix B, p. 171.
can be distributed in the prices obtainable for the lots along the road and in the reduction of the cost of lawn repair along the roads resulting from parking cars on the road shoulder. Curbs will restrict the width of the traffic lanes to the original design and will assist in maintaining a neat road alignment.

The theory that roads should be inconspicuous in the landscape must be reappraised in light of contemporary living habits. The automobile and its accompanying service requirements must be treated as one of the foundations of our society, and therefore, planned for in our landscape compositions. The necessary roads and parking areas required by our traveling population becomes an important and oftentimes a controlling element in landscape architectural problems, and one of the important considerations in cemetery planning.

The defining of the major roads by the use of curbs and gutters, therefore, becomes an element in the design of the cemetery landscape. Sometimes it is desirable to eliminate the lines created by the roads in order to create large sweeping lawn areas. By lowering the road surface and proper grading this effect can be achieved and should be employed whenever desirable.

Minor roads

The location of the minor roads is equally as important as the location of the major roads since they provide access
to the individual grave sections. The planning of the minor road system should be approached without any predilection in favor of any particular road pattern. The designer should seek the road system which is most appropriate for the contours, one which will most advantageously subdivide the cemetery and will give the best shaped sections. Another consideration which makes the location of minor roads an economic factor is drainage. A road which follows the line of natural drainage presents marked advantages in the disposition of surface water.

**Distance between roads.** Since the minor driveways provide access to the grave sites their location has a direct relationship to the size and shape of the sections. It is generally conceded that the carrying distance of the casket should not exceed much over 150 feet on flat ground and not over 75 to 100 feet on hillsides. This would indicate that the distance between minor roads should be approximately 300 feet. Mechanical casket carrying devices are becoming more frequent and this distance of 150 feet may very well be of little importance in the future and the distance between roads of less importance.

The walking distance for people visiting graves will bear a relation to the width of the sections, which in turn will be dependent upon the topography of the sections. If the gradient is in excess of 15 per cent, the maximum without introducing steps, the distance to the center of the section
should be less on the hilly site than on the flatter areas.

Road widths. The right-of-way for minor roads will be less than on the major system. Less traffic must be accommodated and its speed will normally be slower. The area required for storm sewers, water mains and gutters will remain constant and the planting strip is usually a constant 3 to 5 feet throughout the cemetery.

The questionnaire results show that a road width of two lanes or 20 feet is sufficient for minor roads. Parking on the road will reduce the traffic lanes for moving traffic to one; however, this is not considered objectionable since the traffic load is lighter and the speed of the vehicles is less than that expected on the arterials.

Curbs and gutters. Curbs and gutters are desirable on arterials but they are not necessary on secondary roads. A sod or rubble stone gutter will serve the purpose. With such an arrangement there may be considerable lawn damage along the road in wet weather but the damage can be reduced to a minimum by increasing the traffic lane widths and thus minimizing the tendency to park at the side of the road.

Road grades

Road grades within a cemetery may be higher than road grades outside the cemetery because of the lower speeds. The maximum limit in the per cent of grade tolerable is dependent upon the topography and the climatic conditions in the area.
In areas where severe winters are the general rule the maximum would be less than in areas where snow and ice are less of a problem.

The maximum per cent of grade is therefore a local question which cannot be given a definite answer. The American Society of Civil Engineers has defined a maximum grade as that per cent of grade which will minimize hazardous traffic conditions due to the mechanical limitations of the vehicle. The maximums they have established for residential streets will serve as a guide for the cemetery designer. A 7 per cent grade on major streets and a 10 per cent grade on minor streets are the limits set for safe traffic movement. In the cemetery the grades on minor roads is of secondary importance when compared with access to the grave sites. Every attempt should be made to secure grades of moderate steepness; however, a slavish conformity to a predetermined grade may result in undesirable section sizes and shapes or in too many or not enough roads. The gradient on minor roads may be in excess of those desirable for the major roads. Axial views of section monuments or features can be planned on the minor roads to add interest and beauty to the areas inclosed by the major roads. In such cases a strict conformity to the pre-

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determined grade may be undesirable.

By way of contrast it is interesting to note the maximum per cent of grade reported by the various cemetery superintendents. The local topographic conditions found in the various cemeteries are responsible for the range of 3 to 15 per cent reported.1

While maximum grades on roads cannot be definitely established, minimum grades, on the other hand, must not be less than a per cent of grade which will provide adequate drainage. The minimum grade of 1/2 of 1 per cent is usually required to adequately carry off the surface water.

Road construction

A good cemetery road has no special requirements different from a park road. The materials and methods of construction vary with the soil and climate. The type of road built will be greatly influenced by the prevailing construction practices in the vicinity of the cemetery. Sound construction should be insisted upon because the cemetery cannot afford the necessary expense involved in both the maintenance or the appearance of a poorly constructed road system. The major roads will, because of heavier traffic loads, be of a heavier and more durable construction than the minor roads. It must

1See Maximum per cent of road grade, Figure 18, Appendix B, p. 171.
always be remembered that the traffic load of passenger cars and the trucks used by allied industries is heavier in the cemetery than generally supposed.

Parking

The opinion of those responding to the questionnaire favor on-street parking through the cemetery. There is no serious objection to this policy on major roads and it is certainly desirable on minor roads. The cemetery while still serving as a burial ground, also functions as a park for passive recreation. The main road system if properly laid-out will lead people to points of interest, such as magnificent views and impressive memorials. The convenience of off-street parking areas in such spots, most certainly can be justified; if not, the view seems hardly worthy of the importance given to it by the road alignment and placement. These off-street parking areas need not necessarily be developed in the initial development but the areas should be reserved and set aside for future development. The convenience of parking areas close to adjoining lot sections will also add to the desirability of these sections and will be reflected in the price obtainable for the grave spaces.

Walks and paths

Just as the roads give access to the sections, the individual lots must have ready means of approach from the roads.
In old cemetery plans, paths were provided around all sides of the lots; this obviously was unnecessary and wasteful in respect to burial space. Fifty per cent or more of the land was occupied by the pathways. Later, it was realized that there was no necessity for paths on all sides. There is a tendency today, particularly in memorial parks, to feel that it is not necessary that each lot have access to a path or walk, and that one walk will serve three or four tiers of lots. Such arrangements have a great deal of merit because paths in the cemetery are more or less in the nature of reserve land which will be used very little until the sections become so filled with graves that walking across the lots will be difficult. However, this consideration is only true in monument cemeteries, since in the memorial park there will be no conflict with the headstones. Before the designer can solve the problem of the number and frequency of paths he will have to familiarize himself with state laws in respect to access to the grave sites. Some states have definite regulations covering this phase of cemetery subdivision.

**Path alignment.** No matter what the legal regulations may be concerning paths, they should be kept to the absolute minimum in number, so that as many grave spaces can be provided as possible. The alignment of the paths will, to a great extent, be dependent upon the lotting practice. The esthetic consideration of the path alignment is unimportant since the paths are not paved or defined, and therefore are
not an apparent feature of the design as seen on the ground. It is useless to make ornamental figures or schemes out of the arrangement of the paths and lots on the plan. An exception to this is in the case of a group of lots designed for a lodge or society where the arrangement of the gravestones will make the path scheme apparent.

Where the roads follow circuitous routes to gain good grades, a certain number of paved walkways for pedestrians through the sections as cross-cuts may be desirable. These walks should be designed with the same care that the roadways receive in regard to the adjustment to the ground in plan and profile, in the type of surfacing.

A direct route from the road to the grave is desirable, therefore the main paths should lead across the sections rather than lengthwise.

**Walk widths.** The walk system around buildings, the entrance and some important features deserve careful consideration. These walks are paved and thus become elements in the design of the area involved. In all cases of paved walks they must be of sufficient width for two people to walk side by side comfortably. A width of 4 feet is sufficient to meet this requirement; however the scale of the development will also have a bearing on the width of walks connecting the various buildings. Aside from these walks and those used as short-cuts across the sections none of the other paths should be paved or defined in any manner. In places other than these
the driveway will be just as useful for pedestrians as for vehicles. A well-constructed road forms a very satisfactory walk in all kinds of weather.

Results of the questionnaire show that most superintendents consider a path width of from 3 to 5 feet sufficient in monument cemeteries. However, in memorial parks there is a strong tendency to reduce the width of the paths to the absolute minimum which will provide access to the lots as required by state laws or as demanded by the public.

Bridges

Cemetery bridges include both foot and vehicular types. Natural features such as ravines, rivers and lakes add a great deal of interest to the landscape of the cemetery, but they may also seriously interfere with the circulation system. There should be a proved necessity for every bridge before it is built. The location of roads and paths with respect to views and features, even though a bridge may be required, is sufficient justification to warrant its being built.

Esthetic considerations. Bridge locations must be studied in respect to the esthetic potential of certain sites. Often the bridge becomes a dominant feature in the landscape and every consideration of axial views or panoramic views must be studied at the same time as the functional aspects of its

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1See Path widths, Figure 18, Appendix B, p. 171.
location are investigated. Sometimes a minor change in the alignment of the road or path will result in a more satisfactory bridge site in respect to the pictorial effects and the engineering aspects.

The appearance of the bridge must be such as to present a visible assurance of strength and stability. It is not enough for the bridge to be functionally adequate within the exact knowledge of the engineer. An over-emphasis of the structural elements of the bridge is usually necessary in order to maintain a good scale relationship with the landscape development in the immediate vicinity.¹

Grading

Grading is a matter of artistic judgment. Grading in any of its forms involves the handling of earth and the shaping of the earth's surface for esthetic purposes, construction and drainage. In grading large areas, for lawn purposes, the slope of the ground should be made to resemble the ground that surrounds it and of which it seems to be a part. A level lawn in the midst of a rolling territory will be forced and ill fitted. Long, swelling, easy lines of grade, following a natural drainage course should be sought in any attempt at reshaping the earth's surface.

Grading involves the smoothing of irregularities, but it should not be done so as to bring the earth to a level plane, except, perhaps, in small areas or in formal garden sections. A vast area appearing almost flat is generally uninteresting, for no area is absolutely level. An area which appears to us as level at a little distance, may prove to be a gentle swell when examined at a closer range. Whether long flowing lines or short ones are employed, they should be so graduated as to blend and lose themselves one in the other.

The natural undulations, the gentle rises into banks or mounds or gradual falls into regular depressions all add attractiveness to the cemetery and resemble the natural landscape in character. A certain amount of smoothness and ease is desirable in the ground lines, in the interior parts of the cemetery but a greater degree of roughness and irregularity should be sought toward the outer boundaries, thus assisting in a gradual transition from the developed areas to the land beyond the boundaries.

The treatment of banks or other sloping grounds should be handled in such a manner so that the bank presents a stable, natural angle of repose. Sloping grounds may come down to the drive or walk or they may slope upward to higher levels.

We may find attractive sloping grounds all ready-made for us by nature or we may be obliged to humbly follow her lead and treat more or less artificially our sloping grounds after the fashion practices by the natural forces about us. The hardest part of such work is to keep from exaggerating nature or repeating over and over again
some one of her ways of doing things. It should always be remembered, in landscape architecture, that nature never repeats herself.¹

In general the road should be slightly depressed and the sections slightly crowned and graded to give continuity to the surrounding sections and still maintain a constant grade, sloping in the direction of natural drainage.

The preparation of the grading plans is the function of the landscape architect. Proposed changes in grades can be recorded either by contours of finished grades on the general landscape plan or by elevations at sufficient intervals and by section and profiles on the road plan.

Subdivision of the Cemetery

Sections

The size and shape of the sections will be determined by the general landscape plan and the layout of the roads. Each separate tract surrounded by driveways or the boundaries of the cemetery is considered as a section.

Width. For convenience of reaching the center of the sections it is advisable that these areas having drives on all sides should not exceed 300 feet in width except where the topography makes it absolutely necessary. On the other hand, they should not be less than about 200 feet in width,

both from the economic standpoint and from the esthetic or general landscape appearance. Sections along the boundaries will have a driveway on only one side and should not exceed 150 feet, nor be less than 100 feet in width.

**Length.** The length of the sections is of less importance than the width, and may be of any length the designer may consider suitable to carry out his design. Generally, the rule of having sections not less than three times their width in length is followed. This would produce a section about 900 feet in length in a section having a width of 300 feet. However, the rule will not apply to the sections along the property lines since there will be no driveways to terminate one section or designate the beginning of another. Sections of greater length are not objectional provided adequate cross walks are located at appropriate intervals. Cross walks should be spaced about every 200 to 250 feet in all sections greater in length than 300 feet. The use of long sections provides more burial space and saves the expense involved in the construction and maintenance of large areas of driveway.

**Section unity.** The term section as used up to this point has been used in reference to the area bounded by the minor driveways, the areas in which the individual lots and grave spaces are located. Each of these sections is an entity in itself; however, from the landscape architectural viewpoint it should not be developed as an individual unit, but rather as a subordinate unit of a larger area. These larger
areas will be here designated as super-sections which in actuality are several sections bounded by the major roads.

The importance of this concept lies in the landscape architectural design of monument and memorial sites and in the planting composition of the cemetery as a landscape unit. In all other respects the sections remain as individual units. Through the successful treatment of the individual sections as subordinate units of the super-sections a unity of design can be achieved. The landscape development of these individual sections need not be identical, but instead they should be developed so that they will have some degree of individuality. The degree of individuality must be limited to the extent that a harmonious effect can be achieved throughout the super-section and the cemetery as a whole.

Factors influencing lot and grave spaces

The subdivision of the sections into lots and grave spaces involves important considerations in respect to the landscape effect of the cemetery. Providing the greatest possible number of graves per acre, however, must not dominate or be the only concern of the designer. The landscape beauty of the area is quite as important and has a strong bearing on the desirability of the grave spaces. Every grave unit must have the potential of providing a suitable burial space and adequate space for the erection of tombstones and monuments, should they be allowed, or for the placing of a flush grave
Grave size. The square or rectangle is the most reasonable shape for the lots, since rectangular graves must be accommodated. The size of the hole to receive the casket is dependent upon the size of the rough casket which is normally 2 feet by 7 feet with the extremes being 3 feet by 8 feet. The length of the grave is usually set at 10 feet; this allows sufficient space to accommodate a head marker, the hole for the casket and a slight margin between the foot end of the casket and the lot line. Three and one half to 4 feet is set as the desirable width of the grave; this allows a reasonable space between the casket and the lot line or the neighboring caskets.

Types of graves. Cemeteries generally provide three types of grave areas: the adult, the infant and urn grave. The practice of providing a special size grave for the burial of cremation remains will become more prevalent as cremation becomes more popular. The questionnaire showed that an average of 65 per cent of the cremations coming to the responding cemeteries were buried.¹ In some cemeteries a full sized adult grave is allotted to such burials. This practice, while possibly adequately compensating the cemetery for the grave area and its perpetual care, is quite wasteful of burial ground. The grave area for cremation remains can be cut to

¹See Extent of earth burials of cremation remains, Figure 18, Appendix B, p. 171.
a 2 x 2 foot or to a 4 x 4 foot area, depending on the local practice, instead of the 4 x 10 foot area allotted to common earth burials.¹

Sections or portions of sections designed on these modules certainly will become important parts of our future cemeteries as cremation becomes more accepted and as land for cemetery purposes becomes more scarce. Only 52 per cent of those cemetery superintendents answering the question concerning the establishment of special urn sections had such sections. The other 48 per cent made no special distinction in respect to the area in which cremation remains were buried.²

_Urn gardens._ Special areas for the burial of cremation ashes seldom will occupy an entire section. The individual grave spaces are comparatively small, therefore the design of the urn garden will be on a smaller scale than the design of a garden for ordinary burials. Neither will such sections, exclusively devoted to cremation remains, combine very satisfactorily with the design and layout of the regular grave lots because of the difference in space requirements. Urn gardens can very successfully be developed in conjunction with the columbarium or crematory. Many times they are treated in a formal manner and form the immediate setting for these build-

¹See Space allotted to cremation remains, Figure 18, Appendix B, p. 171.

²See Established urn section, Figure 18, Appendix B, p. 171.
ings. The considerations of access to each burial space are the same as for lots; this dictates a design of a formal nature achieving its appeal from the arrangement of walks and grass panels or planting beds.

More rugged terrain can be used for the burial of cremation remains because the grave area is smaller and consequently the level areas need not be as extensive. The problem of subsurface drainage is less acute, since the grave is not as deep, thus lower land can be used than for the other graves before subsurface drainage becomes necessary.

Lot size. For ordinary earth burials the shape and size of the grave will determine the shape of the lots, and the number of graves per lot will influence its size. Through the years the size of lots has gradually decreased. Today's families are smaller and they no longer follow the custom of providing interment property for future generations. It is therefore advisable to design lots for four, six or eight interments as well as larger sized lots for those who prefer to erect monuments. The number of each size provided should be in proportion to the estimated demand for the various sized lots.

The minimum depth of any lot should not be less than 17 feet. This gives space for two tiers of graves without headstones and 6 inches between the borders of the lot and the end of the grave. A 1 foot margin at both ends of the grave
would be more desirable. These small lots should have a frontage of from 8 1/2 to 11 feet at the narrowest part. By placing burials close together this width will allow for three graves and allow 6 inches of space between the outer graves and the lot lines. All lots of this size should be sold without the privilege of monument erection.

Where a large demand exists for small lots it is a good practice to lay out alternately one wide lot having monument privileges and two narrow lots without this privilege. These small lots are known as companion lots. In this way a large number of small lots can be provided and the proper setting and placement of large family monuments can be controlled, giving the cemetery an appearance of spacious, open development. A lot with a frontage of only 11 feet is too narrow to accommodate a monument unless a companion lot is laid out on each side. Two monument lots of 11 foot frontage adjoining each other will bring the monuments less than 10 feet apart, which is too close to provide an adequate setting for them. In fact, no monument should be allowed on lots less than 14 by 20 feet, containing 280 square feet; this space will be sufficient for eight full size graves and a monument. The questionnaire showed that superintendents consider an average distance of 35 feet between monuments desirable.¹

In monument cemeteries where large lots are desirable

¹See Distance between monuments, Figure 18, Appendix B, p. 171.
in order that monuments can be erected the lots should be so spaced and located that adequate safeguards can be maintained so as to prevent the crowding and improper setting of monuments. With the large lots it is not important to divide the area with reference to their division into grave spaces, because the lots are seldom filled to capacity. This however, is not the case with the smaller lots and they should be designed to provide for a given number of graves.

In non-monument cemeteries the size of the lots need not be as generous since no provision needs to be made for the placement of monuments or the necessary planting around them. A lot size of 11 x 18 feet covers an eight-grave lot and a 13 1/2 x 18 foot lot will accommodate ten graves.

**Lot orientation.** Generally it is desirable to have the large lots facing the driveways so that the family memorials and their landscape treatment will form pleasing pictures along the roads. The minimum depth of the front lots along a drive should be 20 feet. This depth plus the planting space of 3 to 5 feet along the road gives a depth to the back of the lot of from 23 to 25 feet. If the monument is placed within a foot or so of the back of the lot and the lots on the other side of the drive are treated in the same manner a distance of approximately 90 to 100 feet will separate the monuments in this direction.

**Graves per acre.** The number of graves that can be pro-
vided per acre of ground is dependent upon the type of cemetery. In monument cemeteries 985 graves per acre is the general figure. Whereas in the memorial park as many as 1,225 graves can be provided in an acre of ground.\(^1\) The area allotted per grave is larger in monument cemeteries because of the additional space required for the erection of tombstones and monuments. More space is also allotted between the graves; however, there seems little justification for this greater distance between the graves other than to provide more space between the tombstones. If the monument privilege is restricted to only a family monument with flush individual grave markers this distance between the graves can be reduced to that used in the memorial park.

Due to the commercial influences in the earlier memorial parks the area allotted to the individual graves was reduced to the absolute minimum. The space between the graves and the area allotted to the grave markers was reduced to the minimum, consequently more graves per acre of land were possible. The trend set by these early parks has been adopted by all memorial parks in laying out their grave units. Since there are no above ground tombstones and memorial sculpture and monuments are limited to those erected by the cemetery the visitor is unaware of the efficient use of the ground.

\(^1\)See Number of graves per acre, Figure 18, Appendix B, p. 171.
Burial gardens. The concept of developing burial gardens in the lot sections originated as a result of the lack of memorial sculpture in the memorial park. Garden development has now become an essential part of the designing of both memorial parks and monument cemeteries. They are developed as gardens of memory for ordinary earth burials, cremated remains and as garden mausoleums. The size of the garden will depend on the type of burials permitted in them. The survey of cemetery superintendents indicates that gardens are being built to accommodate from 100 to 1,500 graves.¹

The general plan of this type of development is to develop a series of gardens, each with its central appropriate feature and designed in such a manner as to be apart from the remainder of the section, combining nature and the art of man but at the same time being in harmony with the landscape treatment of the section. The garden must have privacy and it should not be built as a place of display.

Proper screening with shrubbery is necessary to provide the necessary privacy and transition into the informal development of the section. A real sense of intimacy should prevail in the garden. This is more easily done in a large garden than in the smaller ones. The small garden must, of necessity, be more or less open to the road, while the larger gardens can have a fairly open area at the roadside and by

¹See Graves per garden, Figure 18, Appendix B, p. 171.
proper, skillful planning embrace the idea of bays and prom-
rotories. The garden should also be a combination of nature
and man's handiwork. This can be done by the building of
walls, the construction of small buildings, the outlining of
paths and walks, and the erection of central memorial features.
A limited number of family memorials and tombstones may be
permissible in these gardens provided they are located in
groups so as to prevent crowding and to insure an unobstructed
view of the entire area.

A cemetery made up entirely of gardens may be too
much of a good thing. It seems to me these gardens
should be the jewels of the plan, and more ordinary
and cheaper sections built up around them. ¹

**Single graves.** In addition to the family lot sections,
 provision must be made for single graves. Single graves are
of two classes, the common single grave, which is designed to
be sold at the very lowest price, and the select or preferred
single grave lot. Single graves are often treated as a sort
of disgrace by hiding them as much as possible and using
ground which is inferior because of steepness, wetness or
remoteness from driveways. It was once thought that the least
desirable parts of the grounds should be selected for the com-
mon single grave districts and preferably an area adjoining
the boundary.

The single graves can contribute to the beauty of the

¹Ray Wyrick. Cemetery design. American Cemetery. 26,
no. 4: 23-25, April 1955.
cemetery. In order to get the front monuments farther back from the road, and at the same time avoid the usual plethora of big lots along the drives, the margins of the sections can be plotted in single graves with flush markers. Single grave sections are therefore useful in making borders along the drives, to break up a stone yard appearance in monument cemeteries and in affording long and wide vistas through the middle of the sections. Where single graves are an important part of the cemetery's income, it is well to put special study on the location and arrangement of these graves. The old custom of isolating the single graves in one large section places a stigma on them and hinders the landscape treatment of the area involved.

The select or preferred one grave interment lots will bring a higher price and should be of a larger area than necessary for one grave. Small lots in the more expensive sections can be divided and sold as single graves. In some instances, depending on the location and the local situation, monuments should be allowed on these lots.

Planting areas. The ultimate appeal of the cemetery is influenced by the landscape planting of trees, shrubs and lawn areas. Large reserve spaces in the center of sections are often made for planting. However, sometimes a more effective scheme will result by taking lots here and there throughout the sections for this purpose. In addition to the planting spaces in the lot sections, certain large areas such as whole
sections which contain lakes and important cemetery buildings as the chapel, crematory, columbarium and the receiving vault should be devoted to lawn and planting without any land sold for grave sites. In addition the land adjoining the entrance should be kept free from graves for perhaps 200 to 300 feet and devoted to landscape planting;¹ however, this consideration is not of as great importance in memorial parks as it is in monument cemeteries where tombstones would possibly interfere with the landscape pictures created at the entrance.

The amount of area allotted to planting adjacent to the property line will depend on the type of enclosure or fence used. In no instance should the lots and graves be plotted up to the property line. A reserve strip of from 1 to 100 feet should be allowed for planting and screening the cemetery from the adjacent property.² The width of this planting strip should be so designed that the remaining area between it and the boundary road will divide into regulation size lots and not result in wasted burial space.

Lotting procedure

The method followed in laying out the lots must be one that will utilize the area to the fullest extent and provide

¹Hare and Hare, op. cit., p. 22.
²See Area between fence and graves, Figure 18, Appendix B, p. 171.
the maximum number of grave units. Both the checkerboard and the radial system of lotting or a combination of these two systems are in use.

In the monument cemetery the lotting procedure is made evident by the tombstones, whereas in the park type of cemetery there is no above ground indication of the layout of the lots. One of the main things to be done in dividing a section into graves and lots, in the monument cemetery, is to see that no subsequent grouping or crowding of monuments can possibly occur.

**Lot shapes.** Graves are of a rectangular form, consequently the lots should either be of a rectangular or a square form. Irregular lot shapes represent a certain loss of land and some difficulty in engineering and recording of the lotting system. Careful planning is also necessary to avoid, as far as possible, triangular lots or lots with sharp tapering corners. The loss of land for burial purposes involved in irregular lot shapes oftentimes can be utilized as planting areas, provided the planting plans and the lotting plans are designed as an integral unit.

**Checkerboard system.** The checkerboard system of lotting lends itself readily to the general shape of the grave and produces lots of uniform shape throughout.\(^1\) Graves can readily be oriented east and west by utilizing the regularity

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\(^1\)See Figure 8, p. 92.
produced by this method; however, this custom of grave orientation is not adhered to today and is of little importance in cemetery design. Lots face in all directions and the burial is made entirely with reference to the conditions of the individual lot.

The path area involved in a checkerboard design is much larger than that in the radial system. Not only is the grid-iron system wasteful in path area but also in the amount of land thrown into triangular lots when it is applied to a curvilinear road system. These irregular areas are sometimes left in open lawn or included in the adjoining lots.

Radial system. The radial method of lotting, while being wasteful in burial space, if used along a road with a very small radii of curvature has the advantage of resulting in excellent monument settings. If the area is a circle or nearly so this system produces a very pleasing lotting arrangement, and is ideally suited for the monument cemetery. Monuments may be allowed on the lots facing the road and restricted on all of the interior lots or they may be restricted on the first tier of lots and allowed on the second tier, thus creating a larger area of foreground. These sections can also be developed as the setting for one large monument in the center with all other graves limited to flush markers.

This method of monument restriction, while discussed with

1See Figure 9, p. 94.
Figure 9. Radial system
(Adapted from Cemetery Handbook. Chicago, Ill., Allied Arts Publishing Co. ca. 1921.)
reference to the radially lotted section, is applicable to any other method of lotting.

The use of the radial system of lotting is questionable in the memorial park since too much area is rendered unusable for burial purposes. In areas other than circles, this system results in too much wasted land and a variation of the method is more suitable for the memorial park and equally unsuitable for the monument cemetery where the lotting procedure is more obvious to the observer.

In all sections designed on the radial method, the actual laying-out of the lots becomes more complicated than in the checkerboard system and will require the use of a transite because of the varying degrees of curvature. All lots should be adequately marked at the time they are laid out, since their curved boundaries will be difficult to locate without a transite once they have been lost.

**Variations on the radial system**

Along major roadways in the monument cemetery the lots will be more valuable if arranged in double tiers following the road lines.\(^1\) The laying out of lots in this manner is an adaptation of the radial method; therefore, all lot lines must be erected perpendicular to the driveway. The width of the front of the lots where it is desirable to make the lots

\(^1\)See Figure 10, p. 96.
Figure 10. Variation of radial system
very small and especially where the drive curves outward strongly must be fixed by a minimum width along the inside lot line, since setting the lot lines perpendicular to the drive makes them converge as they approach the center of the section. In such cases it is necessary to space the minimum lot width along the path at the rear of the second tier of lots and letting the frontage of the outside lots come as it will. On the other hand where the drive curves in, the reverse condition will exist, and the minimum frontage must be spaced along the drive and the perpendiculars allowed to strike where they will on the inside rear lot line.

In this method all the graves will face the roads. The irregular spaces caused by laying out the interior area of the grounds in this manner are valuable for planting areas as backgrounds for the monuments along the road.

The interior area of the section formed by this type of lotting can be divided into rectangular plots of sizes adapted to meet the requirements of the lot buyer. Unless this area of the section is very desirable and is well elevated it is best to subdivide it into small lots. Three and four grave lots or lots with a 17 foot frontage and 18 foot depth. Large 12 grave lots can be redivided into half, making two six grave lots, or into quarters, making four three grave lots. All of these small lots should be sold without monument privileges.

Each lot in a monument cemetery should be given frontage on a path; in practice this would place a path every two tiers
apart, approximately 36 feet. Cross walks should be placed at right angles to the paths running parallel to the roads.

While this system avoids the accumulation of triangular spaces along the road it must be remembered that all of the lots radial to the road will contain a certain amount of area unsuitable for burial purposes. Even though this is the case there is a distinct advantage to the cemetery because all of the land is sold and consequently put under perpetual care.

In both the gridiron system of lotting and this variation of the radial system the base lines established in the original topographical survey will be very convenient in laying out and recording the lot arrangement. With lots having straight boundary lines there can be little question as to the exact location of each lot and its boundaries.

Water Supply and Drainage

Both of these are essential to the proper maintenance of a cemetery. Water is needed for the buildings, fountains and for watering purposes over the entire cemetery. Water used for drinking purposes must meet the established standards for health as set by the board of health. If there is a fixed source of supply from the city or other established water works the problem is greatly simplified, otherwise adequate provision must be made to secure a healthful and uncontaminated water source.

For the ornamental water features and lawn sprinkling,
ordinary surface water will serve if adequate provisions are made for its collection and storage. Lakes and ponds can often be used as such water storage areas. While serving a utilitarian function they greatly add to the interest and beauty of the cemetery.

Lawn sprinkling

In climates where the lawns need a great amount of moisture during the hot season, provision should be made for lawn sprinkling systems. Cast iron, steel, transite, or copper pipe are all used in the underground water supply systems. Each type of pipe however has its limitations in respect to durability and a thorough study must be made to determine the most satisfactory type of pipe for the area involved.

In laying out the lots the location of the sprinkler system must be given special consideration. The pop-up sprinklers should be located in the paths. If the cemetery has been laid out without paths, easements should be reserved for these sprinklers every sixth or seventh row of graves. This would make the distance between sprinklers 50 or 60 feet apart. Wherever possible the water lines should be run along the contours rather than across the contours.

Where freezing weather is experienced during the winter, the feeder pipes should be set below the frost line, and other pipes should be provided with drainage or waste valves at the low points. Shut-off valves for cutting off any por-
tion of the system which may be under repair, without paralyzing the entire sprinkler system, will prove a great convenience.

Drainage

The rain water that is not absorbed by the lawns should be directed, by proper grading, to the storm sewer inlets located in the lawn or along the roads. Surface drainage must, therefore, provide for the collection of surface water at definite points or channels and then take it into underground drains before the volume becomes destructive to the lawns and road surfaces. The usual place for the collection of this surface water is along the edge of the roads.

In the case of side-hill roads, if they are so constructed that there is little reason for making a gutter on the lower side to catch the slight run-off from one half or the entire width of the paved area. This run-off can run on to the lot sections without damage. Roads pitching to both sides and those roads in valleys naturally have to be drained from both sides, and any constant or intermittent flow of water from springs in the valleys must be provided for.¹

If sufficient room is provided between the edge of the road paving and the lot lines and where grading permits, a sod gutter is preferable on the minor roads. In a width of

¹Hare and Hare, op. cit., p. 27.
3 to 5 feet a depression of 3 to 5 inches can be secured with a dip so slight, as to be hardly noticeable and into which the grades of the lots will merge naturally. The drain inlets will be concealed in the grass and thus will not be obstructive to the landscape picture.

The distance between inlets, their size and the size of the pipe carrying off the water, will be dependent upon the road alignment, the degree of the slope on the lawn areas, the extent of the area to be drained, the rainfall and the type of soil.

In cases where sod gutters are impossible or inadvisable, a flat concrete or cobble stone gutter without a curb 18 to 24 inches wide is probably the next best choice. Such a gutter will maintain the informality which is desirable on the minor cemetery roads.

Along major roads curbs and gutters should be constructed and the drain inlets made a part of these permanent gutters. There are several forms of drain inlets with iron grating suitable for cemetery use. Where there is a danger of clogging the sewers, either from road material or from other sources, catch basins should be built in conjunction with the drain inlets.

The storm water sewer system is usually not too complex and the pipes should be located along the roads, so that if any repair may be necessary the road pavement does not have to be disturbed. In places where it is necessary to cross
the lot sections with the storm sewer pipes, a special right of way should be provided whenever it is impossible to follow the paths. These drains may empty directly into a brook or lake since they contain nothing but surface water; however, this is not true of subsurface drainage systems.

Subsurface drainage

Subsurface drainage may not be necessary in all instances due to the porous soil condition or due to the lack of ground water. Places obviously in need of under drainage can be economically drained by a system of tile drains 6 inches or more in diameter, laid 1 foot below the bottom of the graves and following the path lines wherever possible. These drains are in constant activity, tending to dry out the ground. The disposition of this water must receive careful consideration, since it is contaminated and cannot be emptied into streams or other water courses. This water should be emptied into a French drain or some other appropriate underground drainage system.

Cemetery Structures

The various types of structures commonly found in a cemetery will vary with the local conditions and the size of the cemetery. Some buildings such as administration and maintenance buildings are required by all cemeteries, especially those not affiliated with an organization such as a church
or a city. In these cases, particularly if the cemetery is not adjacent to the sponsoring organization, it is best for the administration and service buildings to be located in the cemetery. The need for other buildings, such as the receiving vaults, chapel, columbarium and crematory will depend on the type of service rendered to the public by the cemetery.

**Style of architecture**

When considering cemetery architecture, which includes memorial sculpture, the permanent nature of the cemetery and its significance in the community should be a dominant influence on the style and character of all structures. The cemetery, due to the function it serves, is closely tied to our religious convictions and every effort should be made to incorporate this motif in our planning.

The style of architecture used in cemetery buildings will naturally reflect the current philosophy of architectural expression. Our present concept of organic design has almost eliminated the feeling that certain historic architectural styles are most appropriate from an aesthetic point of view. The Gothic and Classical styles of architecture were once believed to be the most expressive and the only appropriate styles of design to be used in cemetery and other sacred buildings. The thorough acceptance of our contemporary architecture has dispelled this feeling and new cemeteries are reflecting the trend by erecting buildings of contemporary
design.

The merits of the various architectural styles as applied to cemetery design are of minor importance to this discussion. The important consideration is that all buildings and architectural features should be harmonious both in style and materials. Durability and permanence are of the greatest importance in cemetery structures of every character and should be insisted upon whenever new construction is contemplated.

Administration building

Regardless of the immediate or projected size of the cemetery the administration building should be so located as to be convenient to the entrance. Close proximity to the entrance is important because through the years many visitors may come to the cemetery by public conveyance and secondly it is important from the standpoint of meeting funeral processions and escorting them into the grounds. In some instances the administration building and other service buildings can be made an integral part of the entrance treatment or grouped at the entrance as units in the design. It is a real landscape architectural problem to get the buildings conveniently located to the entrance and yet allow a good landscape effect that will not be too much dominated by the buildings.

The location of the main structures near the main entrance tends to simplify the road system, at least in small
properties, and makes use of this portion of the grounds which should be primarily ornamental and should not be used for burial purposes. Even though the office building should be located conveniently to the highway it should be far enough back and within the cemetery to permit the average funeral cortege to get off the highway and into the grounds before the first car reaches the entrance of the administration building.

**Maintenance buildings**

In the location of the maintenance group, consideration must be given to the availability to the main highway, circulation and convenience to present and future areas to be serviced. The provision for future expansion is important in the service area, because as the cemetery becomes established more equipment and maintenance supplies will have to be housed and accommodated in this area.

The necessary maintenance buildings and storage yards should be grouped in the least conspicuous place, where they can be secluded from the remainder of the interment sections and not interrupt the road system. The maintenance group will include storage space for all the lawn and landscape maintenance equipment, grave digging apparatus, trucks and other motorized equipment. Monument placement and maintenance equipment, the storage of tombstones and grave markers, should the sale of these items be a part of the cemetery's service,
will also be a part of this group of buildings.

The practice of cemeteries operating greenhouses for the benefit of the public and for raising plants for the cemetery is generally frowned upon by cemetery superintendents. The expense involved in operating a greenhouse is in excess of the value received both in a monetary sense or in the service rendered to the public.¹

Caretaker's residence

In some instances it may be desirable to have the caretaker's residence located in the cemetery; however, there seems to be little justification for such an arrangement other than for security reasons. If this residence is in the cemetery it should be adequately screened from the remainder of the cemetery and provided with easy access to the entrance and outside highway. The caretaker's residence should more properly be located outside the cemetery but in close proximity to it. Whether or not it is the cemetery's responsibility to furnish this residence is a problem of local concern and will vary according to the general practice of neighboring cemeteries.

¹See Greenhouse Justifiable, Figure 18, Appendix B, p. 171.
Service buildings

The size of the cemetery and the completeness of the interment service it renders to the community determine the necessity for public mausoleums, columbariums, crematory and chapel. Many people still prefer to bury their dead above ground and for this reason public mausoleums must be provided in addition to permitting the erection of private mausoleums.

The chapel. The chapel was once considered an essential unit of cemetery architecture; however, today there seems to be some doubt as to the desirability of the chapel in the cemetery. Seventy-seven per cent of the superintendents responding felt that the use made of the chapel did not justify the expense involved in their construction and maintenance.¹ Some of the reasons for this small use of the chapel are that funeral directors have publicized the use of their funeral parlors for performing the funeral service and church officials are strongly advocating the home church of the deceased as the ideal place for the funeral service. While both of these influences are very important today because the majority of funerals are of the earth burial type, they will become less of a consideration when cremation becomes more popular. Chapels are sometimes built in conjunction with crematories. This practice has a great deal of merit. It combines two very

¹See Chapels used enough to justify expense, Figure 18, Appendix B, p. 171.
closely allied functions and it also gives the cemetery the opportunity to render the service of a chapel to those who wish to make use of it. The design of such structures is an architectural problem and therefore beyond the scope of this thesis.

Crematories. The performance of cremations is a function which belongs to the cemetery and should, therefore, be conducted under the guidance of the cemetery. The crematory should be located in the cemetery rather than in some other area outside the confines of the grounds. The crematory and chapel can often be made the feature of either a formal or informal development of roads, walks and flower beds in the vicinity of the entrance or it can be set informally near the center of the grounds. In any case, the site should be determined at the time the road system is designed, because it is important to have ready access from this building to all parts of the grounds as well as from the entrance.

Columbariums. Not all cemeteries will have a crematory but all cemeteries of any size should have a columbarium. This building can also be built in conjunction with a chapel and the same considerations pertinent to the location of the chapel will apply to the columbarium. Developing urn gardens around the outside of the columbarium will give patrons the choice of earth or above ground deposit of cremation remains and these gardens will be quite desirable in respect to the landscape treatment of these buildings.
Receiving vaults. Every cemetery no matter how small should have a receiving tomb where bodies may be temporarily stored. The receiving vaults can be constructed as an integral part of other buildings, thus eliminating the necessity for a separate building. Receiving tombs should be located in reference to the ultimate size of the cemetery, since easy access from this building to all parts of the cemetery is highly desirable.

Gates and fences

The degree of security necessary in a cemetery is open to a great deal of discussion. The cemetery superintendents surveyed in the questionnaire felt that the cemetery should be well protected by gates and fences. Seventy-three per cent of the answers received felt that fences were necessary and 96 per cent stated that they locked their gates at night. The majority of the superintendents answering were associated with monument type cemeteries in which the opportunity for possible vandalism is much greater than in the memorial park type of cemetery. It seems doubtful if the same security measures are desirable or even necessary in the memorial park. The location of the cemetery, however, will have an influence on the answer to this question of fences.

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1 See Fences necessary, Figure 18, Appendix B, p. 171.
2 See Gates locked at night, Figure 18, Appendix B, p. 171.
Cemeteries located in the open country may need fences to prevent cattle from wandering into the grounds but in residential areas a boundary treatment of shrubbery seems more appropriate and sufficient to mark the cemetery boundaries. When a more substantial barrier is necessary the wire fence seems to be the preferred choice as compared with masonry or hedges. The ordinary cyclone type of wire fencing seems hardly appropriate immediately around the entrance and a more decorative type of fence or masonry wall should be used. In more remote areas the cyclone fence if properly planted with shrubs and vines is quite satisfactory.

The enclosure of the cemetery as just discussed related primarily to the utilitarian need of fences or walls. The opportunity of using fences or walls as architectural elements in the landscape pictures should not be overlooked. An occasional view of a well landscaped and well maintained fence or wall is very picturesque, especially where the character of the landscape changes, as it does along the cemetery property line. A fence will prepare the mind for new impressions and afford an easy transition to the views beyond the grounds.

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1 See Type of enclosure, Figure 18, Appendix B, p. 171.
Monuments and Memorial Sculpture

The monument is no longer accepted as an essential feature in the cemetery of today. The word monument as used here refers to a structure dedicated to the family and is usually more pretentious in size and style than the more simple memorials or tombstones erected at an individual grave. The old time graveyards with their assortment of inartistically arranged monuments and tombstones often give the impression of some unusually large, untidy and badly arranged stoneyard.¹

Our modern park-like cemeteries with their broad stretches of lawn, curved driveways and artistically arranged groups of trees and shrubs, highlighted with several well chosen and properly located pieces of memorial sculpture, have a greater appeal to our present generation than do the cemeteries in which no restrictions are placed on the erection of monuments and tombstones.

Our best authorities on cemetery planning find it difficult to harmonize monumental structures with their conception of the ideal cemetery, which they visualize as a park-like enclosure dedicated to the dead for a final sleeping place, as the name implies, so beautiful, quiet and restful in its aspect as to afford not only comfort and consolation to the bereaved, but a certain degree of pleasurable anticipation to all who contemplate the hour when they, too, shall join the great majority.²

¹See Figure 11, p. 112.

Figure 11. Inharmonious grave stones, Pine Grove Cemetery, Wausau, Wisconsin (photograph by the author)
Even though planners and a great number of other people have this conviction, there nevertheless remains a large percentage of our population who prefer to perpetuate the memory of their departed by erecting monuments and tombstones. Since we find this sentiment we will have to conclude that both the monument and the memorial park type of cemetery will be in demand and will continue to be established.

The problem of monuments is chiefly restricted to the monument cemetery; however, the principles governing design and location of them are also applicable to the memorial sculpture and section features found in the memorial park cemeteries.

**Setting and location**

The influence of the environment on the monument itself and the effect produced by the monument on its surroundings are important considerations to the landscape effect of the cemetery. The impression may be disagreeable and disturbing or suggestive of repose depending upon whether or not their relationship is harmonious. If given a proper location and artistic setting a monument may be so harmoniously adapted to its environment as to be regarded as a component part of the landscape, thus creating the impression that without it the scheme would be incomplete.

Many excellent monuments, beautiful in design, have proven to be a disappointment merely because they were
inappropriately located. One monument of inharmonious design may ruin a large area or create a discord by dominating all other structures in the vicinity.

More than one monument of similar design should not be erected in the same vicinity. Few obelisks or spire-like monuments should be seen from one vantage point. An obelisk is usually misplaced if erected in the foreground, especially if it is close to the driveway. It is seen to best advantage if provided with an appropriate background of trees and shrubs and located on a gentle slope on comparatively high ground at some distance from the road. The elevation of the ground on which the monuments are placed is quite important. An obelisk itself may appear to be in a hollow or on a level area, but in such locations it generally detracts from the landscape.\footnote{Ibid., p. 328.}

The gentle undulations of the ground should be preserved in appearance. This effect may be retained and accentuated by selecting low monuments for the lower levels and higher designs on the more elevated ground. The crest of a sharp rise, particularly when it is close to the roadway suggests low monuments.

Spires erected at the distant end of gradually narrowing valleys or vistas generally present pleasing pictures. On the other hand, a valley or vista may be ruined in its effect if a tall monument is placed in the foreground.
Very broad styles of monuments such as the exedra should not be placed in the foreground except on very large lots at an abrupt corner of a section or in the open lawn. These designs, in most instances, should be given a place in the background where a proper setting of shrubbery may be introduced without detriment to the other lots in the rear.¹

There should never be uniformity of sizes in any group or locality because this would be as unsatisfactory as uniformity of design. Variety within well-ordered and artistic limits is most desirable.

Design

Every monument should be designed for its own particular lot; however, oftentimes this is impractical because of financial reasons in which case the lot should be selected to provide a proper setting for the monument, which in reality implies that the lot and the monument should be selected at the same time. When the lot must be purchased from the ground available, the monument designer should study the lot and its surroundings and design or suggest a type of monument that will harmonize with the proposed setting. For the best results the landscape architect should be called into consultation and the planting, grading and other lot improvements carefully planned, so that the lot, monument and planting will be

¹Tbid., p. 361.
a harmonious, unified composition.

**Restrictions**

The maximum development of cemetery beauty is possible only when the design of the monument is suited to its particular location and where the adjacent landscape is in harmony with the lines, color and construction of the monument. The ideal situation is to permit monuments on certain lots where proper settings have been provided and to eliminate them on others where open areas or long vistas are desirable. The decisions as to where monuments are to be allowed should be made by the landscape architect and recorded on the plans prepared by him.

The considerations outlined for monuments also apply to tombstones. The disunity in our monument cemeteries is primarily due to the incongruent assortment of tombstones rather than to the family monuments. Some monument cemeteries have attempted to solve the problem by insisting that all grave markers be flush with the ground, thus eliminating all tombstones. The success of such a policy will depend upon the attitude of the public patronizing the cemetery.

It is the cemetery management's responsibility to develop the grounds as designed by the landscape architect and consequently all monument and tombstone designs should be subject to their approval before they are erected. Not only should the cemetery officials insist upon an appropriate
design but also on a durable material and sound construction.

Sculpture in park cemeteries

The question of memorial sculpture and section features in the memorial park is greatly simplified because all features are erected exclusively by the cemetery association and the setting and sculpture design is planned for in the original design of the cemetery. Only the finest examples of sculpture should be erected. In their planning the same procedure as used in planning for public monuments should be followed. On these assignments the sculptor works in collaboration with the architect who develops the architectural features and the landscape architect who plans the setting.

When a sculptural feature is located in a section, no matter how large or imposing the statue may be it should always be given an ample and dignified setting. Such a setting is often accomplished by the use of flagstone terraces or by walls and steps, and with a suitable planting of trees and shrubs.

The use of too many statues, no matter how artistic they may be, should be avoided because a profuse use of them would naturally show a dearth of ideas and produce a feeling of monotony in the memorial park. The ideal memorial park is the result of a tasteful and restrained combination of art and nature.
The charm and beauty of the cemetery or, for that matter, any other landscaped area belongs to a great measure to the arrangement and character of its planting. All planting must be done to bring out the character of the natural landscape of the cemetery, its hills and valleys, water features and other scenic features.

Landscape style

The landscape character most readily obtainable, most fitting and the simplest to maintain in the cemetery is that known as the pastoral landscape or American Style. This type of landscape is found in many of our famous parks and consists of wooded areas, large open lawns with specimen plantings of trees and shrubs concentrated in strategic locations in respect to the pictorial effects desired. Hubbard and Kimball in their book "An Introduction to the Study of Landscape Design" give the following explanation of the pastoral or the American Style of Landscape Design:

This American style of landscape design traces its origin directly to the English landscape school, but in the American work the designers sought with much more appreciation the preservation and interpretation of natural character. The English designers have desired to express the magnificence and taste of the owner in a composition of natural ground forms and trees modeled after the beautiful English countryside, rather than to suggest the freedom of little-humanized Nature in which a man might lose his consciousness of self. The choice of indigenous plant material, the study of the
arrangement of this material in accordance with its own character and of that in the landscape in which it appeared, is therefore an important consideration in this American style. The landscape characters, however, the "natural" landscape scenes, which this style usually seized upon to enhance and reproduce, are seldom the unhindered work of nature, more usually they are the scenes of pasture and woodlot, shrub-grown walls, and elm-dotted river bottom, which are partly the result of man's activity in the less intensively used farm land. This mode of treatment of the landscape on large areas has not only the esthetic advantage which has been pointed out, but also the economic advantage that thus it may make use of much existing beauty of land-form and vegetation, and thus it can be consistent with land lying beyond its boundaries and so give a still greater sense of freedom and extent.

In the smaller suburban places where the buildings are visible if not dominant and where it is quite impossible to produce exactly the effect of a free landscape, this style takes on itself a somewhat different manifestation. Even in the compass of an area of half an acre, there may be an open irregular lawn surrounded by promontories and bays of planting and broken by two or three free-standing trees. Such an arrangement need make no attempt to imitate the natural forms which have inspired it. It may be obviously man-made and may contain arrangements of plants and flowers not native, but the design may still suggest free landscape by the natural character of the plant material and its informal arrangement, and may still, thus in its small compass be a more restful thing to its suburban owner than any purely formal design might be.¹

Beyond some possible formality at the entrance, there is little question about the informal or naturalistic style of landscape development being the most beautiful and most appropriate in the remainder of the cemetery.

Expressing topography

The desirability of creating an impression of high ground in the cemetery has been commented upon previously. Rising ground may in appearance rise still higher, by planting it with trees of humble growth toward the bottom and gradually taller ones toward the summit. An additional mark of the inclination of falling ground may be obtained by placing a few trees in the same direction as the slope which will point out the direction of the descent, whereas plantings across a descent will in visual effect bolster-up the ground, and check the fall. Placing trees obliquely across the slope will often divert the general tendency to accentuate the slope of the ground. The ground will to some extent assume the direction of the trees and they will make a variety not a contradiction. Hedges or low continuous plantings carried across uneven ground render the irregularities more conspicuous, and frequently mark little inequalities which would otherwise be unnoticeable. If a line of trees runs close to the edge of an abrupt fall, they will give the change in elevation added depth and importance.¹

Wooded areas

Whenever wooded areas exist in the cemetery area, considerable study should be given to them before any decision

is made as to their removal or thinning. Some people prefer to have burial lots among the trees and if properly thinned these areas can be transformed into attractive burial sections. Large tree masses are desirable parts of the pastoral landscape scene and therefore, any existing tree masses should be utilized in the development of the planting composition of the cemetery. The natural outline of a woods is seldom an artistic line, it is therefore the task of the landscape architect to reshape this outline and relate it to the pictorial composition he is developing in the other areas of the cemetery.

The first requisite of a wood's outline is irregularity. Long straight lines of trees or a succession of easy sweeps and gentle rounds are both unnatural and inartistic. The true beauty of a forest's outline consists more in breaks rather than in sweeps, in angles rather than in rounds, and in variety instead of succession. The outline of a woods is a continued line and small variations do not save it from monotony. One deep recess or a bold prominence has more effect than numerous irregularities. These divide the outline into parts, but no break is made in the unity. A continuation of the woods remains, only the form of it is altered and the extent is also seemingly increased.¹

¹Ibid., p. 215.
Planting composition

The recognized principles of landscape planting composition apply to the cemetery as well as to other landscape developments. Any scheme of landscape development depends for its final success largely upon the vegetation; however, the design of the roads, paths and grading cannot be neglected. Planting in some instances will obscure bad curves and grades but it should never be relied upon to justify these weak points of design. An intelligently designed landscape must be a comprehensive unit, so that the roads, grading, planting and any construction will be arranged in proper relation to each other, and result in a complete picture from various points of view.

Unity, harmony, rhythm and variation, all elements of design, when properly combined will produce the open spaces, distant views and secluded, intimate areas so desirable in the cemetery scenery. The application of these principles in cemetery design are similar to those used in parks. The scale of development in a park is similar to that of a memorial park cemetery.

Large areas of lawn and tree groupings, as well as shrub and flowers are used to produce esthetic effects which may be used, with variations, over and over again, as far as their combinations of high and low plants and the contradictions or contrasts of color and form will permit. One mass will,
for a moment, conflict with another and then flow over and blend with it. There should be sharp contrasts and then gradually the smoothest blendings of these planting masses.

The various types of masses should be allowed to assert themselves freely throughout the landscape instead of a group of high and low growths, a single specimen or a small group of trees may stand out almost alone with a few attending shrubs in the vicinity. Farther on there may be a different kind of tree standing on the edge of a solid group with a few scattered shrubs around it. Then again there may be single specimen trees standing entirely alone without any accompanying planting. Such trees whether out in the middle of a lawn area, or near a path or road are valuable features in the landscape. They lend dignity and character to the bays and promontories of the planting masses, more so than any other members of the association of trees and shrubs growing in the area. When these specimen trees are combined with shrubs an effect of distance is often produced which is of great value in the landscape picture.

After the general planting plan has been made it becomes a question of establishing unity of details through the various plant masses. The designer should start by first disposing certain plant types in the design as if he were blocking in the outlines of a picture, indicating the main and controlling features of the group. To mark this distinctive character only a few varieties of trees, shrubs and flowers
are necessary, the ones that assume such distinctive forms that the eye instinctively singles them out in any group. However, it is not only necessary to punctuate, as it were, with marked trees and shrubs, the outlines of each group, but also of the groups within the main group so that the distribution of these familiar construction features may direct the eye to the actual composition of the design and produce a unity throughout all of the planting. ¹

**Screening.** Since the cemetery is a land use different from that of the city or its surrounding land uses it should be screened from the adjacent land or the public highway. Complete screening, however, is as undesirable as no screening at all and the decision as to which views should be screened and which should be developed must be made before the composition of the planting can be determined.

The method of screening the boundaries should be as varied as possible. In some places the trees and shrubs should run along the boundary for several hundred feet obscuring the outside landscape and in other places it should be made narrower and lower so that views of the outside country are possible. In other places these distant views should be made visible under isolated trees standing among but high above the shrubbery.

¹Ibid., p. 206.
Distant views

Apart from this enclosure, which is necessary for protection, very interesting features of distant landscapes can be incorporated into the cemetery scenery by the arrangement of trees and shrubs as framing elements. Distant views of great extent lying beyond the actual grounds produce an appearance of measureless extent. However, these views must be so managed that one is not aware of the intervening cemetery boundary. Views out of the cemetery into the open country-side may be allowed to remain open, but it is undesirable to let the spaciousness of the cemetery depend upon these views, since the cemetery may some day be surrounded by the city. Special features such as views should never be seen twice in the same way. Through the proper placement of trees and shrubs the extent and direction of views can be controlled.

Scale of effect

In the monument cemeteries the scale of the landscape effects are of necessity smaller than in the memorial park cemetery. The monuments and tombstones limit the extent of the open lawn spaces, thus making them smaller units. These smaller lawn areas should be treated as individual units which is often accomplished either by a continuous planting of low growing trees, evergreens and shrubs or by irregular mass plantings, so located that the view across a burial section
is broken or obstructed and thus forming vistas where some object of interest can be made a feature in the landscape. The vista, in monument cemeteries must be used with caution because they are apt to become simply a monotonous continuation of stone work. Monument restrictions must be placed on lots lying within the vista in order to maintain an open lawn area.

**Monument backgrounds**

No feature of planting composition is of greater importance in the monument cemetery than the formation by planting of suitable backgrounds for monuments. A proper setting for a well designed monument is as important as the design of the monument itself. The best results come from planting the areas where monuments may be erected before the lots in the section are offered for sale. By doing this it is possible to preserve at least to some extent the vistas and various effects of light and shade.

The background or bands of planting should follow irregularly the lot lines forming interesting curves and recesses and should be of sufficient width to provide a proper background for the monument.\(^1\) In some instances it may be necessary to reserve whole lots for planting. Planting reservations through the center of the sections may be good in some

\(^{1}\)See Figure 12, p. 127.
Figure 12. Section planting plan (Courtesy of Earl C. Grever, Landscape Architect)
places, but it is often better to take certain lots at places and connect them with narrower strips of planting along the borders of the other lots.

**Plant material**

The plants that can be used to carry out the landscape effects of our plant compositions will depend upon the region and the local situation. The vegetation of a new place should conform to the character of the existing growth peculiar to the region. However, the planting need not consist of only those species native to the area. There are many trees and shrubs of kindred habit, hardiness and appearance but of foreign origin that will unite with those native to a specific territory. The spirit and nature of the scenery should be made the key to the harmony of the planting.

The flora of the United States is so varied that it requires considerable study and familiarity with the local plants to prepare a planting plan of artistic merit. The great variety of available plants enables the designer to select plants for color effects of flower, foliage, bark and fruit, as well as low, medium and high growing varieties and plants of round, pyramidal, columnar or spreading growth habits. The plants suitable for landscape purposes naturally separate themselves into the following broad divisions: evergreen trees, deciduous trees, evergreen shrubs, deciduous shrubs, vines, perennials and annuals.
Evergreens occupy a position and perform a function of great importance in the landscape picture. They produce the solid effects, the strong shadows and the continuous color throughout the season. Evergreens form an all year positive feature in the landscape and therefore, require pleasing arrangements of form and color in their immediate vicinity.

Besides the type of foliage, form and color of deciduous trees and shrubs the more positive character of the trunk, branches and twigs, bare in winter and early spring, must be considered in developing the planting. All these separate qualities in a tree or shrub must be handled in a sympathetic way in the composition of a year-round landscape.

Perennial plants play a subordinate but an important part in our planting schemes. They should be treated in the same general way as the tree and shrub masses. Perennials are used in colonies or in clusters at the feet of shrubs and trees, or as ground-cover plants in the shrub groups.

Plant materials, buildings, roads and all of the other elements previously discussed constitute the essentials which are involved in developing the plan of the cemetery. The composition formed by these elements should always be an expression of sound landscape architectural design and planning, which ultimately is manifested by the actual landscapes produced but may, in part, be shown graphically in plans.
THE CEMETERY PLAN

The plan of the cemetery is the reality of the process of design and is a composition of the various elements discussed in the previous sections of this thesis. Design is a process of predetermining the form and function of an object or an area in which the individual units are arranged and brought together in a functional and pleasing manner. There are two types of design—economic and esthetic. In economic design the utilitarian needs of an area or object are the most important, whereas in esthetic design the ability of that which is brought into reality, to give and produce pleasurable sensations, is the controlling factor.

In the art of landscape architectural design, as in all other forms of successful design, both forms of design are integrated and form the foundation upon which the ultimate success of the creation must be judged.

The design of a cemetery is a landscape architectural problem in which the economic factors are all too often given greater emphasis than is justifiable. If the problem of designing or creating a cemetery is attacked from the standpoint of the inherent landscape character of the site the esthetic features of the site can be allowed to dominate the design and at the same time produce an economically profitable business venture.

The various aspects involved in cemetery design have
been discussed in previous chapters. All of these various and sometimes conflicting considerations must be brought together in a harmonious and unified composition in which the sum total of all the parts is greater than the value of the individual units. The success in arranging these various functions and the ultimate success of the cemetery plan as a landscape unit lies in the experience and skill of the landscape architect.

Design

The design of a cemetery can naturally be approached from various angles. The method whereby the landscape character of the site becomes the controlling influence on all decisions of composition is far superior to the one in which the dominant factor is the size and shape of the individual grave units. Naturally the grave size is important and will influence some of the final detailed aspects of the design. Nevertheless, in the preliminary studies the means through which the inherent landscape character of the area can best be expressed are of much greater value in arriving at a successful solution.

The relative importance of the individual elements, the entrance, administration buildings, service buildings, burial areas and maintenance area in respect to their relation to
each other can be expressed in a schematic diagram.\textsuperscript{1} However, the theoretic sequence of arrangement cannot be adapted to all sites. The cemetery, as is any other work of landscape architecture, is a dynamic entity and consequently every situation requires an individual solution based on the uniqueness of the site.

Basically all suitable cemetery land can be classified into three broad general types: the flat, the gently rolling and the hilly. The topography of the site will dictate and give form to the cemetery elements. By studying the topography of the site and the location of the site in relation to the center of population to be served, the schematic design of the cemetery can be developed,\textsuperscript{2} taking into consideration the native vegetation and natural features such as streams and views.

As has been mentioned previously, relative elevation within the cemetery is an important aspect of the design. The entrance and particularly the major road system should be so located that the burial areas appear, if not in reality, to be on a higher elevation than the roads. If this can be achieved for both the entrance and the main roads the solution to the plan is greatly enhanced. However, the entrance must of necessity be located in relation to the center of

\textsuperscript{1}See Figure 13, p. 133.

\textsuperscript{2}See Figure 14A, p. 135.
Figure 13. Schematic diagram of cemetery design

Burial Areas
- Lots and graves
- Circulation
- Service buildings
  - Chapel
  - Crematory
  - Columbarium
  - Mausoleum
  - Receiving vault
- Natural and man-made features

THE CEMETERY
Figure 14. Evolution of the cemetery plan on flat topography

A. Schematic plan developed after a study of existing conditions and the relation of the site to the center of population being served

B. Design of the road system in respect to the contours of the area

C. Final cemetery plan
population and the accessibility to the highway. Consequently
this consideration takes precedence over that of elevation.

On a flat topography the road alignment of both major
and minor drives will be relatively simple and more regular
than on more rolling terrain. As the topography becomes
rougher the road system becomes more complicated; nevertheless, simplicity in alignment should be the guide. When the
road system is designed to complement and express the topo-
graphy simplicity will generally be the natural result.
Figures 14B, 15B and 16B illustrate this fundamental prin-
ciple of simplicity in road systems when the alignment is
dictated by the topography of the site.

On flat areas the road system will reflect the economic
aspects of section width and the philosophy of the designer
more than it will on rolling terrain. Figure 14B illustrates
the influence of the rectangularity of the grave sizes. The
roads are generally straighter and more uniform in spacing
than the roads in Figures 15B and 16B where conformity to
the contours has resulted in a curvilinear road system.

When natural features such as a stream exists on the
property, and the possibility of building a lake or in some

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1See Figure 14, p. 135, Figure 15, p. 138 and Figure 16, p. 140.

2See Figure 14, p. 135.

3See Figure 15, p. 138 and Figure 16, p. 140.
Figure 15. Evolution of the cemetery plan on rolling topography

A. Schematic plan developed after a study of existing conditions and the relation of the site to the center of population being served

B. Design of the road system in respect to the contours of the area

C. Final cemetery plan
Figure 16. Evolution of the cemetery plan on hilly topography

A. Schematic plan developed after a study of existing conditions and the relation of the site to the center of population being served

B. Design of the road system in respect to the contours of the area

C. Final cemetery plan
other manner featuring the water, the major road system should be so designed that it will lead traffic to this point of interest. Figure 16B\textsuperscript{1} shows a possible solution for directing traffic to the lake and back again to the exit without necessarily retracing the approach route.

In the location of the service buildings such as the chapel, crematory, columbarium and receiving vaults, the consideration of easy and directness of approach from the entrance must be a dominant factor. Nearness to the entrance is of secondary importance in contrast to directness of route and access to the burial areas. These service buildings can become points of interest in themselves or they can be subordinated to natural features.\textsuperscript{2} Figure 16B illustrates the location of the chapel as an element in the development of a lake. At first glance it may seem unnecessarily remote from some portions of the burial areas and particularly from the entrance. In this instance it seemed justifiable to sacrifice a central location because of the excellent view and the adaptability of this area of the cemetery to the chapel site. Such decisions must be made from a landscape point of view and justified on the basis of the advantages to be gained.

\textsuperscript{1}See Figure 16, p. 140.

\textsuperscript{2}See Figure 16, p. 140.
The subdivision of sections into lots and grave spaces must be done in such a way that the greatest number of usable grave spaces can be provided. Figures 14C, 15C and 16C illustrate an adaption of the radial method of lotting.\(^1\)

The Cemetery Converted into a Park

From the standpoint of an attractive landscaped area and an open space in the city, the cemetery serves a valuable service as a passive recreation area in addition to its function as a burial space. It is, therefore, an asset to the city and should be continued after it no longer functions as an active cemetery. In the past, cemeteries have often become neglected after they were no longer used as burial areas but with the practice of perpetual care the future maintenance of the cemetery is assured. The present consensus maintains that a cemetery should not be permitted to unduly hamper the living and on such grounds cemeteries can be relocated to make way for city expansion.\(^2\) The unsightliness of neglected cemeteries is often used as a justifiable reason for moving the cemetery out of the city. Nevertheless, this is not universal in the United States. Whether or not this feeling will continue in the future is uncertain; however, it is the

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\(^1\)See Figure 14, p. 135, Figure 15, p. 138 and Figure 16, p. 140.

writer's opinion that the cemetery after it is no longer used as a burying ground is a priceless asset to the community not only as an attractive bit of landscape art but as an open space within the crowded city. These cemeteries should therefore be preserved not necessarily intact as a cemetery but converted into a use taking advantage of the beauties that exist. Since the cemetery resembles a park in character, it seems only natural that they should be converted into passive recreation areas.

The sentiments connected with a cemetery are rather hazy and unattached approximately three or four generations after the last burial has been made in them, unless some famous person is buried there. After an interval of this length, the cemetery could be converted into a park without undue adverse comments from the citizenry. Graves of famous persons could be turned into shrines and made points of interest in the park and other monuments and statues of less prominence would be eliminated. The individual tombstones will have to be removed and the flush grave markers could either be removed or remain without interfering with the feeling of the park atmosphere. In cases where the tombstones and flush markers are removed a small permanent marker flush with the ground and large enough to inscribe a number on it should be placed at each grave. All of the burials within the cemetery would be keyed according to this number system, making it possible to locate any grave should the occasion arise to
find the exact burial place of an individual after the cemetery has been converted into a park.

Figure 17 illustrates how a cemetery could be changed into a park provided the original design was conceived of and executed with such an eventual conversion in mind. The major road system of the cemetery forms the park road system with all or most of the minor cemetery roads eliminated. In the original design sufficient road right-of-way and parking area should be reserved so that the park can function efficiently without interfering with the burial areas. The views as developed for the cemetery would serve as the attractions in the park.

It is the writer's belief that while such a scheme may seem quite radical, at the present time the groundwork has already been laid for a reappraisal of the public's opinion in respect to such a theory. In 1947 a park-cemetery combination was designed and executed on a 25 acre peninsula in Pacific County, Washington. Both functions were designed as a landscape unit but functionally separated and independent of each other. By accustoming people to enjoy life and play next to a cemetery it seems to be a relatively easy transition to having the public accept the practice of participating in

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1See Figure 17, p. 146.

Figure 17. Transformation of the cemetery into a park

A. Original cemetery plan

B. Major road system of the cemetery has been converted into the park road network by eliminating most of the minor cemetery roads

C. The eventual park as developed from the cemetery
a passive form of recreation in the cemetery.

The conversion of the cemetery into a park will result in an efficient use of the land involved and bring some much needed recreation areas into the heart of our cities. Since the cemetery was originally endowed by perpetual care, the cemetery after its conversion into a park will not require public money for its maintenance and repair because the perpetual care fund would carry on this work. Such a practice will of necessity require some enabling legislation on the state level to make the use of such money available and to define the extent and coverage of perpetual care on cemetery lots.
CONCLUSIONS

The design and layout of a cemetery is one of the important aspects of successful cemetery operation. It is the hope of the writer that the basic elements of cemetery design that have been brought together, defined and coordinated, will clarify the scope of this essential phase of cemetery management. As a result of this study it is hoped that the landscape architect will become aware of the importance of developing this phase of the profession. Cemetery design gives the landscape architect an opportunity to express himself in one of the important and lasting landmarks of our society and of its culture.

The author is hopeful that the suggestions set forth will stimulate interest for further detailed studies and investigation both in design of cemeteries and related aspects of cemetery management such as perpetual care and its ultimate influence.

Research in the general field of cemetery operation is greatly hampered because of inadequate statistical records concerning cemeteries and the final disposition of the dead. The writer strongly recommends that state vital statistic bureaus initiate a system of recording not only the date of death and cause but also the method of disposing of the corpse and the location in which the remains have been placed. In addition to this suggestion, some agency either county or
state should ascertain the amount of land devoted to cemeteries in its jurisdiction and the exact location of all of this land.

In reviewing the problems of cemetery design, certain definite conclusions can be reached:

1. The ever present business aspects of cemetery management requires an economical and esthetically satisfying development which can only be achieved through the skill and experience of the site planners and landscape architects.

2. The site selected should be one suitable for cemetery purposes and integrated into the regional plan or city plan in such a way that the cemetery will always remain an asset to the city and its functional future growth.

3. Memorialization within the cemetery should be restricted to the best and most artistic examples of sculpture and monuments.

4. All cemeteries should be so located and designed to become an integral part of the city or regional park system and the access to them related to the parkway network of the urban area.

5. The design of the cemetery should always be approached from the angle of expressing the landscape character of the site and then fitting the fixed cemetery requirements of graves and lots into this
6. Ultimate use of the cemetery area will influence the arrangement of the various cemetery elements. What this eventual use will be cannot be ascertained at this time but if, as suggested, they be converted into passive recreation areas after they are no longer used for burial purposes, the original design should reflect this eventual use. A cemetery should therefore be designed as a park and the minor roads, grave sections and cemetery buildings fitted into and related to this basic plan. Even if the cemeteries are never converted into parks this approach will result in the best and most satisfactory cemetery composition.


De Forest, A. S. Family burial plot, the Harvey S. Firestone memorial at Columbiana, Ohio. Landscape Architecture. 37, no. 1: 22-25. Oct. 1946.


Hare, Sid J. and Hare, Herbert S. Planning and design. In Cemetery Handbook. Chicago, Ill., Allied Arts Publishing Co. ca. 1921. pp. 9-34.

Hargrave, Herbert R. Statistical report of the Cremation Association of America from January 1, 1934 to December 31, 1953. Fresno, Cal., Cremation Association of America. 1954.


ACKNOWLEDGMENTS

Material published by certain organizations has been of outstanding aid in the preparation of this thesis. Although credit has been given for all quotations from this material, it has not always been shown for the ideas which have been obtained from these publications. These organizations are:

The American Cemetery Association

The National Monument Association

The writer wishes to express appreciation to Professor John R. Fitzsimmons, Head of the Department of Landscape Architecture at Iowa State College for the suggestion of the topic and his guidance and assistance throughout the course of the work.

Particular thanks and appreciation is extended to those cemetery superintendents who cooperated in the questionnaire and shared their experience and knowledge on cemetery management with the writer.
VITA

FATHER: Lloyd Hiram Kreiser

MAIDEN NAME OF MOTHER: Stella Elizabeth Ditzler

BIRTH: Route 2, Jonestown, Pennsylvania, October 17, 1925

ELEMENTARY SCHOOL: Ditzler Grammar School,  
Route 2, Jonestown, Pennsylvania

SECONDARY SCHOOL: Jonestown High School  
Jonestown, Pennsylvania

HIGHER SCHOOLS: Pennsylvania State University, University  
Park, Pennsylvania, B. S. in Horticulture,  
major in Landscape Design, June 1952,  
Iowa State College, Ames, Iowa

PROFESSIONAL PRACTICE: Landscape Architect  
Boone Gardiner Nurseries  
Louisville, Kentucky  
Landscape Architectural Consultant  
Pennsylvania Department of Welfare

IN CHARGE OF MAJOR WORK: Professor John R. Fitzsimmons
APPENDIX A

Cemetery Classification

The custom of establishing definite burial grounds has a pre-historic origin and is universal among all people who bury their dead. The word cemetery is derived from the Greek verb meaning "to put to sleep", a cemetery is literally a sleeping place, a place of temporary rest. In its original connotation, therefore, it is devoid of any suggestion of the dreariness which eventually became associated with it.¹

In the United States cemeteries are generally classified as monument or non-monument cemeteries depending on the type and extent of personal memorialization allowed within them. The National Cemetery Association in a report on cemetery acreage, in the United States, in June of 1955 reported 12,000 active cemeteries in the country. An active cemetery was one which had a telephone. Of the 12,000 cemeteries, 10,000 were monument, 1,000 a combination of monument and non-monument sections and 1,000 non-monument memorial parks.²

Another classification makes the division on the basis of ownership. Using ownership as a criterion of grouping, we find cemeteries designated as institutional, municipal, and


private, either individually owned or incorporated, without any regard to the type of memorialization allowed in them. The cemetery as known in American culture has become one of the most permanent of all land use types; once established the area involved is generally dedicated and set aside in perpetuity.

Cemetery acreage

The amount of land devoted to cemetery purposes in the United States has never been accurately determined. Official records as to the area and extent of burial grounds are not kept by civil authorities, consequently any determination as to the extent of this type of land use is only approximation.

In the previously quoted report by the National Cemetery Association concentrating on active cemeteries, many small cemeteries throughout the rural areas were obviously eliminated since they did not have a telephone listing and many cemeteries which are no longer in use were also neglected. The 549,190 acres of land devoted to cemetery use and owned by the 12,000 active cemeteries represents an area two-thirds the size of the State of Rhode Island. This is, however, only a partial figure of the over-all total acreage devoted to cemetery purposes in the United States.

Under our present system of burial the number of graves per acre of burial space is between 885 in monument ceme-
1,600

teries and 1,225 in non-monument cemeteries. 1 Assuming that an average of 1,000 graves per acre will compensate for those corpses cremated and also give a reasonable number of graves per acre based on the fact that the majority of burials take place in monument cemeteries, 1,481 acres were required to bury the 1,481,091 corpses during 1950. 2

In a 1950 population projection report of the United States Bureau of the Census, the population for the country was set at 225,000,000 by the year 1975. 3 Assuming that the death rate of 9.2 per 1,000 population of 1954 4 will remain stationary and that we will have a constant and equal increase in cemetery needs during the period from 1950 to 1975 it will require an average of 1,775 acres annually to meet our cemetery requirements during this period. This annual increase will add an additional 44,475 acres to our present cemetery acreage by 1975. Most of this land will be located in and near our metropolitan areas.

1See Number of graves per acre, Figure 18, Appendix B, p. 171.


Urban cemetery

The trend away from a rural toward an urban civilization in the United States has gradually increased since the beginning of the twentieth century. The past decade has witnessed an accelerated move toward urbanization and it is not unreasonable to expect greater migration toward metropolitan centers within the next several decades.

This great influx of population into the cities has magnified existing deficiencies in our cities, and at the same time created new problems due to the fact that services which were previously supplied at various and scattered locations throughout the countryside must now be provided in a concentrated manner and within a definite geographic area.

Even though the total acreage devoted to cemeteries will not be any larger in an urban than in a rural society, it will, however, be concentrated within the metropolitan region or even within the city. Cemeteries which a decade ago were located beyond the city find themselves encircled by the city today and oftentimes they become obstacles to the expansion of the city. Cemeteries are, therefore, becoming important and prominent features in the landscapes of our cities; their location and design are of the utmost concern to landscape architects and city planners. The value and function of a cemetery after it has served its primary purpose, that of a burial place, is dependent upon its design, development and
location in respect to the growth and efficient functioning of the city.

The Changing Aspects of Cemetery Design

Perpetual care

The desire to provide for the maintenance of cemetery lots through the medium of perpetual care funds has given added emphasis to the aesthetic qualities of the cemetery. The neglected cemetery, which causes so much dismay to all interested persons will be non-existent after perpetual care becomes universal. Not only does this trend result in providing maintenance for active, functioning cemeteries but also results in attempts to recondition and beautify old abandoned cemeteries.

In no phase of cemetery work is the experience and skill of the landscape architect and those of the other design professions more essential than in the work of reconditioning these neglected cemeteries. The ideals of design which influenced their original development are no longer considered the best, consequently the existent land use pattern must be brought into harmony with present ideals of cemetery design by the ingenious and comprehensive application of design skills.
The automobile

The automobile has permeated all phases of American life and culture and its influence is also felt in the cemetery. Vehicular circulation, therefore, becomes a major consideration; the drive alignment and lotting procedure are dependent upon easy access and the flow of traffic throughout the cemetery. The higher speeds of the auto as compared to horse drawn vehicles has resulted in planning on a larger scale than was hitherto considered necessary. The vistas, so highly prized in all landscape developments are becoming simpler in detail, larger and more panoramic in treatment due to the fact that less time is available to appreciate their beauty while traveling in an auto than while in a carriage. Similarly, other developments in American life are affecting cemetery design.

Cremation

The changing temperament of American society concerning the disposal of the corpse will become more pronounced in cemetery design as cremation becomes more universally accepted. Actual current figures on the annual rate of increase in cremation are not available because of the Cremation Association of America's policy of refraining from publishing current figures for public consumption. However, by studying published reports, it is obvious that it is on the increase and all
indications point to further increases in its popularity. The Cremation Association of America, in a 1954 statistical report,¹ reported an increase of 12 per cent in the number of cremations for the period 1949 to 1953 as compared with the 1944 to 1948 period.

The public continues to look to the cemetery to provide the proper facilities for the disposal of crematory remains, either in the form of columbariums or earth burial. From all indications earth burials of cremation remains are most prevalent; 65 per cent of the cremations at the cemeteries whose superintendents responded to the survey were buried.² This trend influences not only the design of the cemetery in respect to individual grave sizes but also the type of territory in which the cemetery can successfully be located. The desirability of comparatively flat land will not be as important when the grave size is cut to 4 x 4 feet instead of the present 4 x 10 feet. Even though cremation is on the increase, the greatest portion of cemetery land in the foreseeable future will be devoted to the burial of the corpse.

¹See Table 1, p. 165.

²See Extent of earth burial of cremation remains, Figure 16, Appendix B, p. 171.
Table 1. Statistical report of the Cremation Association of America from January 1, 1934, to December 31, 1953.

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<th></th>
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<td>11,407</td>
<td>24</td>
<td>12,784</td>
<td>12</td>
<td>15,277</td>
<td>20</td>
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<td>Territory of Hawaii</td>
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<td>6,319</td>
<td>51</td>
<td>8,375</td>
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<td>Non-reporting Crematories (Estimated)</td>
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<td>-6</td>
<td>4,785</td>
<td>7</td>
<td></td>
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<tr>
<td>Grand Total</td>
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<td>24</td>
<td>226,227</td>
<td>24</td>
<td>264,002</td>
<td>16.5</td>
<td>299,202</td>
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Adapted from a statistical report submitted by Herbert R. Harrieve, Secretary, Cremation Association of America, 1620 W. Belmont Avenue, Fresno, California. The submitted figures of each individual crematory have been kept confidential, and added to its geographical area.
APPENDIX B

Cemetery Questionnaire

Landscape Architecture Studio
Iowa State College
Ames, Iowa

1. What is the most desirable distance a cemetery should be removed from the center of population?

2. Is it desirable to have acceleration and deceleration lanes at cemetery entrances? ________ What length should they be?

3. Is it desirable to have entrance structures, gates etc., set back from the cemetery entrance? ________ How far should they be set back?

4. How far should the main entrance drive extend into the cemetery before branching into other driveways?

5. What should the maximum grade be on driveways? ________ On lawn sections?

6. Is it desirable to have patrons park on the roadway? ________ Is it desirable to increase the width of the road to provide parallel parking? ________ To provide parking space at appropriate intervals? ________

7. What is the most desirable width for driveways?

8. What should the distance be between the monuments and the roadway in a monument section?

9. What is the accepted width of sections in new developments? ________ Is there a tendency to increase this width?
10. What is the average length of sections, provided the contours of the area are such as to permit unlimited length? ______. What is the minimum length a section should be?

11. Are grass paths being eliminated in recent cemetery designs? ______. If not what should their width be? ______. How many graves should be provided between paths?

12. Is it customary, in newer developments, to provide a fence around the property? ______. Are they necessary? ______. What type are most satisfactory—Wire ______. Masonry walls ______. Hedges ______. Others ______. How high should they be?

13. Do cemeteries which have fences and gates lock them at night?

14. How much area should be provided between the fence or wall and the first grave? ______. Is it preferable to have this area planted with shrubs ______ or left in open lawn?

15. What size lots are most in demand by the folks of average means? ______. Wealthy people ______. Poorer classes ______

16. How many grave spaces as a rule are provided per acre in: Memorial park cemeteries ______. Monument cemeteries ______. Garden type cemeteries ______

17. What type of permanent markers are most desirable for marking the corners of individual lots?

18. Do new cemeteries consider the added expense of construction and maintenance of pools and lakes justifiable?
19. What percent of a 100 acre tract should be devoted to:
   Roads
   Paths and walks
   Plantings (shrubs)
   Plantings (trees)
   Service and administration
   buildings

20. What is your feeling concerning the construction of chapels—they should___or should not___be encouraged?

21. Are chapels used sufficiently to justify the expense of construction and maintenance? ______ Are new cemeteries building them?

22. Is it desirable to build chapels in connection with columbariums? ______ Do you have this type of a structure?

23. Are special earth burial sections set aside for the remains of cremations? ______ What is the customary space allotted to individual burials? ______ To what extent are cremation remains deposited within the soil?

24. Is the maintenance of a nursery by a cemetery justifiable? ______ Are many cemeteries maintaining a nursery?

25. Are greenhouses justifiable for supplying the cemetery with bedding plants? ______ For supplying cut flowers to patrons? ______ Do you maintain and operate a greenhouse of either purpose? ______

26. To what extent should patrons be restricted in respect to doing private planting on individual lots? ______ What restrictions do you place on this type of activity?

27. Do you consider the "Garden Type" of design a significant design form? ______ or merely a temporary revolt against the Memorial Park Type of design? ______ Is it a compromise, of sufficient merit to last, between the Memorial Park and the Monument type of development?
28. Are Garden Type developments being designed in a garden-esque manner (annual and perennial flower beds etc.)? or merely enclosed with suitable shrubs and hedges?

29. What is the average number of graves in a typical garden?

The name of your cemetery

Number of developed acres

Number of undeveloped acres

Age of the cemetery and its type

Size of the city in which it is located

Average number of burials per year

______________________________
Signature

______________________________
Address

Additional comments:
Figure 18. Tabulation of pertinent questionnaire data
<table>
<thead>
<tr>
<th>Cemetery No.</th>
<th>Cemetery</th>
<th>Location</th>
<th>Superintendent</th>
<th>Type</th>
<th>Age</th>
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