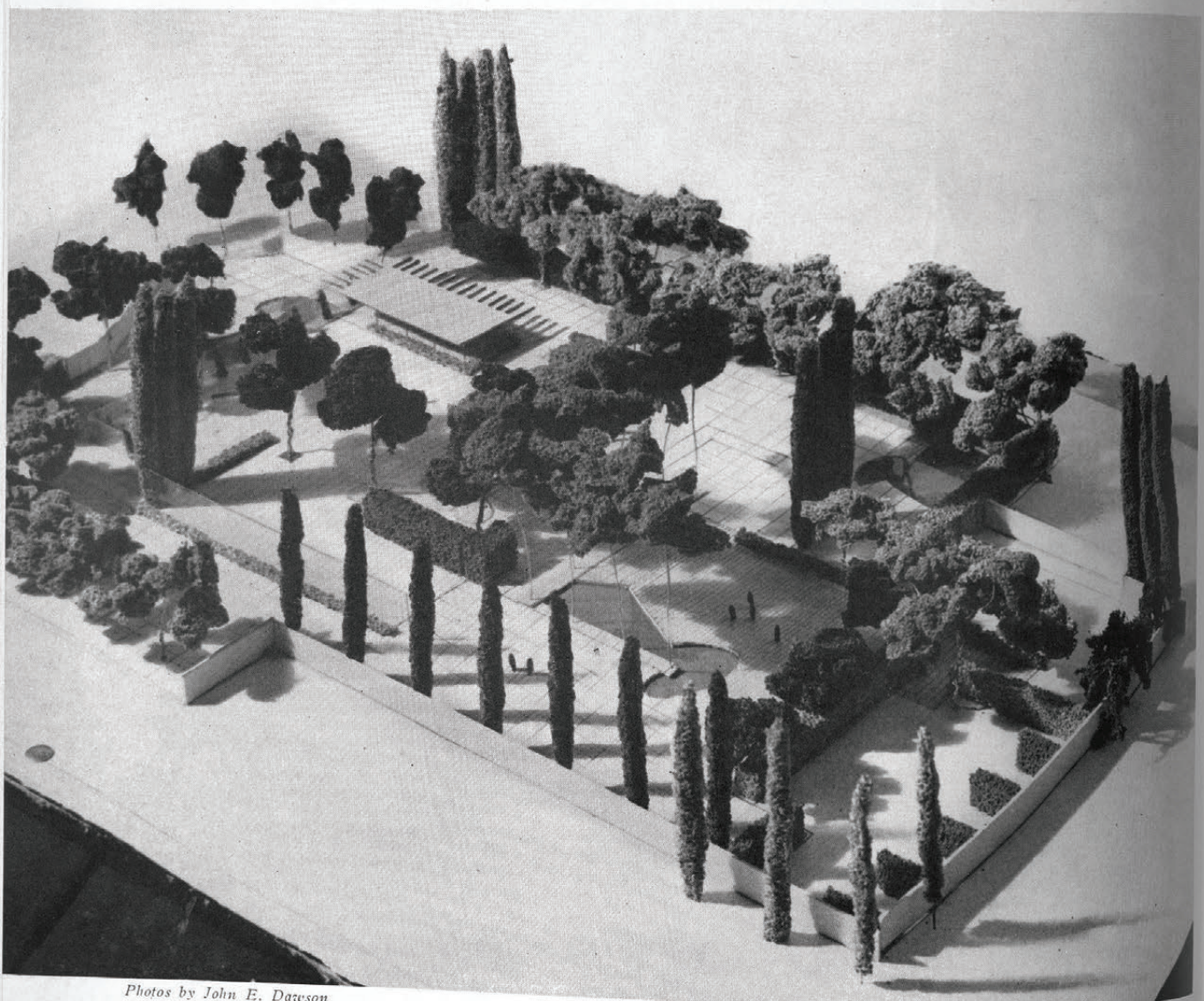


*Choosing plants to fulfil design requirements through their inherent qualities as materials, the author shows in this working model how a space composition in plant form types is achieved through definition of space, without restricting circulation. He refers to it as "sculpture in plant materials; not in the ordinary sense of an object to be looked at, but the constructivist type of sculpture which is large enough and perforated to permit circulation." Transparent glass bricks, plant forms below the eye level, and tree branches above the eye level give a sense of division without obscuring the view, resulting in a three-dimensional composition. The detail opposite shows the architectural division of space*



*Photos by John E. Dawson*

# PLANT FORMS AND SPACE

MATERIALS CREATE VOLUME BY DEFINITION OF SPACE

BY JAMES C. ROSE

SPACE is the constant in all three-dimensional design, but a realization of space is not possible until it is defined by materials. In both architecture and landscape, material plus space create a volume through which human beings circulate and carry on the functions of living. Two material elements placed in close relationship, but not joined, create immaterial form out of the intervening space, and we derive a relation of void to solid wherein materials create volume out of infinite space. Individuals circulating within this volume of space interrupted and defined by material, perceive what is known as the interspatial vista which is apparent from any point within the volume, and in any direction one chooses to look. It replaces the arbitrary axial vista which is apparent from only one line of sight.

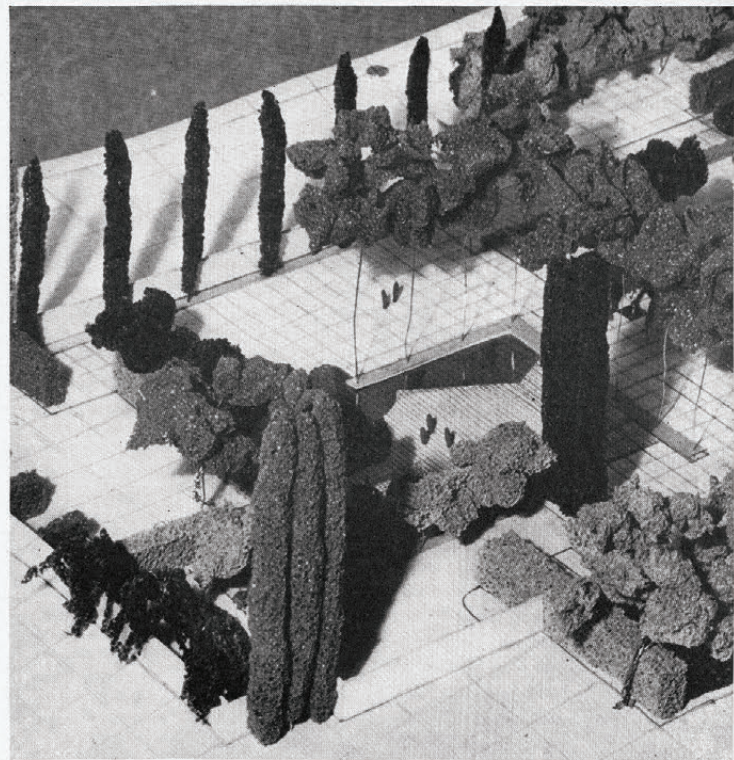
In buildings, we define space mainly with structural material to provide for the functions of living which require shelter. This structural outer shell articulates the form of interior volumes, which are broken into smaller volumes or partial volumes for use and circulation requirements and the best possible relation of void to solid, by which is created a knowledge and feeling of space.

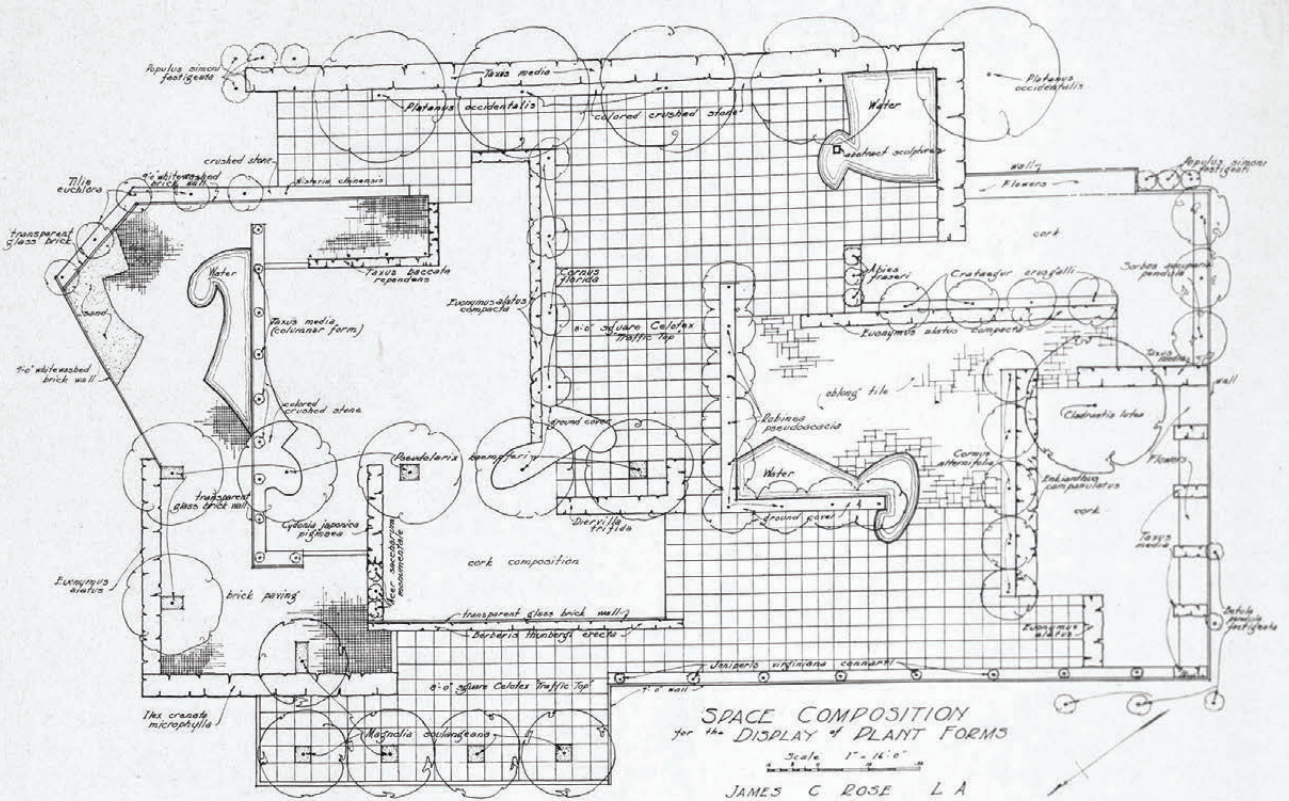
In pure landscape, we drop the structural shell and the volume is defined by earth, paving, water, and ground cover; foliage, walls, structures, and other vertical elements on the sides; and sky, branching, and roofing above. When we move outdoors, the change is mainly one of materials to provide for a different phase of man's activities. Some of the conditions now are largely beyond control of the designer: existing topography, the scale and nature of surrounding country, and the human need for expansion and freedom due to the larger scale of less confined space; but the spatial conception of design remains the same.

## II

PRACTICALLY all the weather-resistant materials of architecture have a landscape use, but plants are the great connecting link between

man, highly-refined materials, and the uncontrollables of the outdoors. Plants enter into the domain of that which is not man-made but man-controlled, and because of their ever-changing qualities, require deeper knowledge and experience in their use than any other material. For example, to use plants intelligently, a landscaper must first know his territory: soil, climate, and indigenous growth. Then he must understand plant forms: not as he would like to have them (or as he might draw them) but as they grow, and to what extent they can be found in variations from the type, or altered and directed by constructive pruning. He must understand the potentialities of each plant: rate of growth, maximum height and breadth, and characteristic effect at maturity. He must know them not as separate forms alone, but also the immaterial form which will result in combination with other





living and architectural materials. He must consider marked contrast in value and color. He must visualize the constant change due to growth and season, and arrange for combinations which, as they change, will create an evolving space effect analogous to recent experiments in sculpture which preserve plastic and interspatial effects while in motion.

It might also be called visual music in which we have form stops of the more constant evergreen and architectural materials, and space and surface variations played in terms of deciduousness, bloom, texture, fall and spring coloring, and bark and branching characteristics. The greatest discipline is required to get spatial combinations of these effects because location, exposure, and soil conditions will alter the normal characteristics, but through the skilful use of plant materials it is possible to add the fourth dimension of motion to landscape design. It is easy! One meets very few architects who do not admit that they can do their own landscaping.

### III

FREEDOM is the catch-word in landscape design. "Ah, wilderness!" murmurs the architect, as he looks at the panoramic view of "billowy foliage" through a thirty-foot expanse of glass with steel supports. "Complete wilderness," he echoes, and the stillness is broken only by the radio and the shrill train whistle at the town station . . .

Despite the extreme discipline and knowl-

The plan of the garden discussed in this article, drawn only as a record, illustrates the direction of circulation by placing of the plant, water, and architectural barriers. Interest is gained through the natural heights and forms of plants at maturity; with utilization of some of the newer paving materials for their exceptional value in outdoor design, providing direction as well as pattern

edge in the arts and sciences which have brought the only freedom we have in our lives, the architect still nourishes the illusion that freedom and wilderness are synonymous in nature. He forgets that every product he uses in his buildings is completely "natural," but refined by industrial processes. If wilderness is such a beautiful thing, and offers such freedom, why not leave it undisturbed, and retreat to a perfectly "natural" cave?

His architectural mind, preoccupied with that which occurs within the shell of a building, can see no justification for design which has no compulsion of shelter. He forgets that the real purpose of design is to facilitate the activity of men. He forgets that although shelter has compulsion, there is no compulsion whatever about having architects to provide it. Shelter would occur with or without architects just as the landscape is humanized wherever man goes—with or without advice from the landscaper—but if skill and knowledge rather than primitive wilderness contribute to the freedom of men, both professions have ample justification in service.

# MAJOR PLANT FORMS IN VALUES FROM LIGHT TO DARK

AUTHOR'S NOTE: The following is a simplified form palette of plant materials which can be used in the northeastern United States. It is not intended as a list from which plants can be ordered without verification. The spelling of Rebder's "Manual of Cultivated Trees and Shrubs" has been followed and this table—prepared with the cooperation of Homer K. Dodge, of Wyman's Framingham Nursery, and Harlan P. Kelsey, of Kelsey's Highland Nursery—has been checked by Professor Ralph W. Curtis, of Cornell University.

The forms are not necessarily the only ones which the

particular plants assume, but they are sufficiently common as listed to render the classification useful.

The height is that of maturity or where it will serve a landscape purpose from ten to twenty years.

The values are those which are sufficiently common to be worth while listing, but individual selections must be made. These values are considered much as pigments in watercolors, which change when used in relation to light, distance, and other pigments.

No obscure plants are used, all of them can be moved, and tender plants are marked with asterisk.

## COLUMNAR (ratio approximately 8:1 except where otherwise noted)

HEIGHT	LIGHT	MEDIUM	DARK
50' plus	<i>Populus simoni fastigiata</i> <i>Populus nigra italica</i> <i>Quercus robur fastigiata</i>	<i>Acer saccharum monumentale</i>	<i>Abies fraseri</i> <i>Cryptomeria japonica lobbi*</i>
40-50'	<i>Betula pendula fastigiata</i>		<i>Fagus sylvatica fastigiata</i> <i>Juniperus virginiana cannarti</i>
20-40'		<i>Thuja occidentalis</i>	<i>Thuja occidentalis douglasi pyramidalis</i>
12-20'	<i>Juniperus communis suecica</i> <i>Thuja occidentalis pyramidalis</i>	<i>Crataegus oxyacantha splendens (6-1)</i> <i>Ligustrum vulgare pyramidale</i>	<i>Juniperus virginiana schotti</i> <i>Chamaecyparis lawsoniana</i>
6-12'			<i>Taxus media (columnar form)</i>
3-6'	<i>Juniperus communis hibernica nana</i> <i>Ligustrum ibolium</i>		<i>Taxus cuspidata nana (upright form trimmed)</i>

## HORIZONTAL (effect of right angle opposition to vertical form)

HEIGHT	LIGHT	MEDIUM	DARK
50' plus		<i>Quercus palustris</i>	<i>Pinus strobus</i>
40-50'	<i>Nyssa sylvatica</i> <i>Pseudolarix kaempferi</i>	<i>Quercus palustris</i>	<i>Pinus strobus</i>
20-40'	<i>Crataegus mollis</i>		
12-20'	<i>Styrax japonica*</i> <i>Viburnum prunifolium</i>	<i>Crataegus crus-galli</i> <i>Cornus florida and alternifolia</i>	
6-12'	<i>Evonymus alata</i>	<i>Ligustrum ibota regelianum</i> <i>Viburnum tomentosum</i>	
3-6'	<i>Juniperus chinensis pfitzeriana</i> <i>Lonicera morrowi prostrata</i>	<i>Diervilla trifida</i>	<i>Taxus cuspidata nana</i> <i>Juniperus sabina tamariscifolia</i>
1-3'	<i>Juniperus chinensis sargentii</i>	<i>Cydonia japonica pigmaea</i> <i>Juniperus horizontalis</i>	<i>Cornus horizontalis</i> <i>Taxus canadensis</i>

## PENDULOUS (as opposed to vertical and contrasted with horizontal)

HEIGHT	LIGHT	MEDIUM	DARK
50' plus	<i>Acer saccharinum wieri</i> <i>Salix elegantissima</i>		
40-50'	<i>Betula pendula dalecarlica</i> <i>Salix babylonica</i>		<i>Fagus sylvatica pendula</i>
20-40'	<i>Salix niobe</i> <i>Juniperis communis oblonga pendula</i>	<i>Morus alba pendula</i>	
12-20'	<i>Prunus subhirtella pendula</i>	<i>Cornus florida pendula</i>	
6-12'	<i>Forsythia suspensa</i>	<i>Rosa multiflora</i> <i>Rosa setigera</i>	<i>Tsuga canadensis pendula</i> <i>Tsuga canadensis Kelsey</i>
3-6'	<i>Cotoneaster salicifolia floccosa*</i>	<i>Abelia grandiflora*</i> <i>Berberis triacanthophora</i>	<i>Taxus baccata repandens*</i> <i>Tsuga canadensis pendula</i>

BROAD AND SPREADING (with trunks exposed through foliage)

HEIGHT	LIGHT	MEDIUM	DARK
50' plus	<i>Platanus occidentalis</i> <i>Gleditsia triacanthos</i> <i>Populus alba</i>	<i>Quercus alba</i> <i>Quercus macrocarpa</i>	<i>Gymnocladus dioeca</i> <i>Quercus rubra</i>
40-50'	<i>Cladrastis lutea</i> <i>Salix alba</i>	<i>Pbellodendron sachalinense</i> <i>Celtis occidentalis</i>	<i>Pinus thunbergi</i> <i>Pinus strobus</i>
20-40'	<i>Malus (common apple)</i> <i>Magnolia soulangeana</i> <i>Sorbus decora</i> <i>Halesia tetraptera</i>	<i>Pbellodendron chinense</i> <i>Chionanthus virginica</i> <i>Prunus avium</i>	
12-20'	<i>Caragana arborescens</i> <i>Amelanchier laevis</i> <i>Laburnum alpinum*</i> <i>Albizzia julibrissin*</i>	<i>Cornus florida</i> <i>Magnolia glauca</i>	<i>Pinus montana</i> <i>Cercis canadensis</i> <i>Viburnum sieboldi</i>
6-12'	<i>Enkianthus campanulata</i> <i>Myrica carolinensis</i> <i>Euonymus yedoensis</i>		<i>Pinus mugo mughus</i> <i>Rhododendron hybrids</i>
3-6'		<i>Cotoneaster divaricata</i> <i>Paeonia suffruticosa</i>	<i>Kalmia latifolia</i>

ROUND OR OVAL (more solid with regular outline)

HEIGHT	LIGHT	MEDIUM	DARK
50' plus	<i>Acer saccharum</i> <i>Acer pseudo-platanus</i> <i>Catalpa speciosa</i>	<i>Aesculus hippocastanum</i> <i>Prunus sargentii</i> <i>Fagus americana</i>	<i>Acer platanoides</i> <i>Tilia vulgaris</i> <i>Fagus sylvatica riversi</i>
40-50'	<i>Acer rubrum</i> <i>Betula alba</i>	<i>Tilia cordata</i> <i>Fraxinus lanceolata</i>	<i>Tilia euclora</i> <i>Magnolia acuminata</i> <i>Carpinus betulus</i>
20-40'	<i>Sorbus aucuparia</i>	<i>Aesculus carnea</i> <i>Cercidiphyllum japonicum</i> <i>Crataegus mollis</i>	<i>Pinus montana</i>
12-20'	<i>Crataegus pruinosa</i> <i>Malus arnoldiana</i> <i>Malus floribunda</i> <i>Sorbus decora</i>	<i>Acer tataricum</i> <i>Cornus florida</i> <i>Syringa japonica</i>	<i>Evonymus europaea</i> <i>Cornus mas</i> <i>Ilex opaca*</i>
6-12'	<i>Hibiscus syriacus</i> <i>Berberis verna</i> <i>Lonicera fragrantissima*</i>	<i>Magnolia stellata</i> <i>Berberis dielsiana</i>	<i>Calycanthus floridus</i> <i>Vaccinium corymbosum</i>
3-6'	<i>Thuja occidentalis globosum</i>	<i>Azalea poukanensis</i> <i>Evonymus alata compacta</i>	<i>Pinus mugus</i> <i>Ilex crenata microphylla</i>
1-3'	<i>Viburnum opulus nana</i>	<i>Berberis thunbergi minor</i>	<i>Taxus canadensis stricta</i>

IRREGULAR AND PICTURESQUE

HEIGHT	LIGHT	MEDIUM	DARK
50' plus	<i>Gleditsia triacanthos</i> <i>Quercus montana</i> <i>Gymnocladus dioica</i>	<i>Robinea pseudoacacia</i> <i>Acer rubrum</i>	<i>Pinus strobus</i> <i>Pinus nigra</i> <i>Fagus sylvatica pendula</i>
40-50'	<i>Ginkgo biloba</i> <i>Juglans regia</i> <i>Ailanthus glandulosa</i>	<i>Sassafras albidum</i> <i>Betula nigra</i>	<i>Pinus densiflora</i> <i>Pinus sylvestris</i>
20-40'	<i>Aralia spinosa</i>	<i>Malus tbeifera</i>	<i>Pinus thunbergi</i>
12-20'	<i>Halesia carolina</i> <i>Acer ginnala</i>	<i>Cydonia (common quince)</i> <i>Prunus americana</i>	<i>Oxydendrum arboreum</i> <i>Cercis canadensis</i>
6-12'	<i>Malus sargentii</i> <i>Rosa hugonis</i>	<i>Ilex verticillata</i> <i>Hamamelis vernalis</i>	<i>Taxus cuspidata (with pruning)</i>
3-6'	<i>Juniperus chinensis pfitzeriana</i>	<i>Cotoneaster dielsiana</i> <i>Berberis julianae*</i>	<i>Cotoneaster divaricata</i> <i>Juniperis sabina</i>
1-3'	<i>Juniperus chinensis sargentii</i>	<i>Juniperus communis depressa plumosa</i>	<i>Thuja occidentalis "little gem"</i>