Alzheimer's disease and nursing home design

by

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INTRODUCTION

Problem Description

Alzheimer's disease is receiving the attention it deserves because it is the most common cause of severe decline in thinking and remembering ability in middle aged and older persons. It is the fourth leading killer in persons over the age of 75, and these persons are the fastest growing population group in our country (Gwyther, 1985). One in three persons in the U.S. will face coping with memory loss in a parent, older relative, or sibling.

One half of elderly persons currently admitted to nursing homes have moderate to severe memory loss with accompanying changes in behavior. These changes may force facilities to re-think nursing care plans, medical and social management.

The issue to be addressed in this thesis deals with design considerations directed towards the therapeutic activities of the nursing home staff who care for residents with Alzheimer's disease. The author defines a therapeutic activity as any task the nursing home staff provides for the benefit of an Alzheimer's disease resident. In order to design a physical environment that can best support therapeutic activities of the staff members, and not disrupt the residents who suffer from Alzheimer's disease, consideration must be given to all of

the primary users of the environment.

Environmental design implications

If a person is unable to function independently he/she
may become dependent upon staff, thus increasing the time
and efforts staff members must devote to each resident.
Specially designed environments can enable staff and
residents to function at their highest levels in
comfortable and nonthreatening surroundings. The physical
environment should support as much as possible a better
working and living relationship between staff and resident;
the two primary user groups of the environment. The
environment can help the staff give better care to the
Alzheimer's resident by contributing to issues of
wayfinding, spatial orientation, and care provider stress.
Through initial interviews with the staff of nursing care
facilities, these issues were found to be of the most
concern.

Methodology

In order to examine these issues the author will
use case studies, a variety of interviews, and current
readings. Based upon findings from the previous research,
schematic design suggestions are developed, and
illustrated. This will provide practical, and beneficial,
site specific, responses to concerns staff members have

towards the care of residents with Alzheimer's disease. It is the intention of the author that this thesis will benefit designers of long term care facilities. Optimally, this thesis will provide a starting point from which to approach design and care problems. As Ruth Hall Phillips states, "Accommodating the impaired should not be seen as a design constraint, but as a design opportunity, a challange to the architect to be creative" (Fisher, 1985).

LITERATURE REVIEW

The following literature review addresses topics that relate to the care of nursing home residents with Alzheimer's disease (AD). The review includes an overview of an aging population, types of care facilities for the elderly, a review of AD, and a synopsis of publications dealing with design guidelines for persons with dementia.

Overview of an Aging Population

Although getting older affects adults in various ways, there are some similarities among older persons. For some, aging can mean less physical strength and a greater dependency on others. Older persons are more likely to experience a sense of loss in social position such as worker, spouse or parent (Howell, 1977). Retirement and fewer family obligations mean that older persons have more leisure time and fewer opportunities to meet others outside the home. Thus, frequently they withdraw from society and depend more on their immediate environment at home.

Growing older also means a reduction in sensory acuity. Losses in sight, hearing, sense of balance, and touch diminish the older person's ability to respond to environmental stimuli. Sight problems include a sensitivity to glare, loss of peripheral vision, inability to clearly discern objects in low light situations, and a

lack of color distinction. With diminished senses, older persons receive less information about their surroundings. Realization, on the part of the elderly, of sensory loss may lead to further withdrawal.

There are many aspects to the process of aging: physiological, psychological, and social. In general, because the aging process reduces skills, agility, sight, and memory, finding a positive self-image becomes increasingly more important but much more difficult for the elderly.

Demographics of aging

The increase of the older population, in terms of numbers and as a percentage of the nation's overall population, is an important demographic change in our society. In 1900, only 4 percent of the total population was over the age of 65. This percentage has risen to more than 11 percent in 1980. This growth will slow slightly during the 1990s because of the fewer number of babies born during the Depression Era and WWII. However, the most rapid increase is expected between the years 2010 and 2030 when most of the "baby boom" generation reaches the age of 65 (Fowles, Administration on Aging, 1987; Figure 1). The rise in population over age 65 is due, in part, to the control of infectious diseases which once killed people before they passed through middle age. The most notable

increase in the population of older Americans has been
among the very old (age 85 and over).
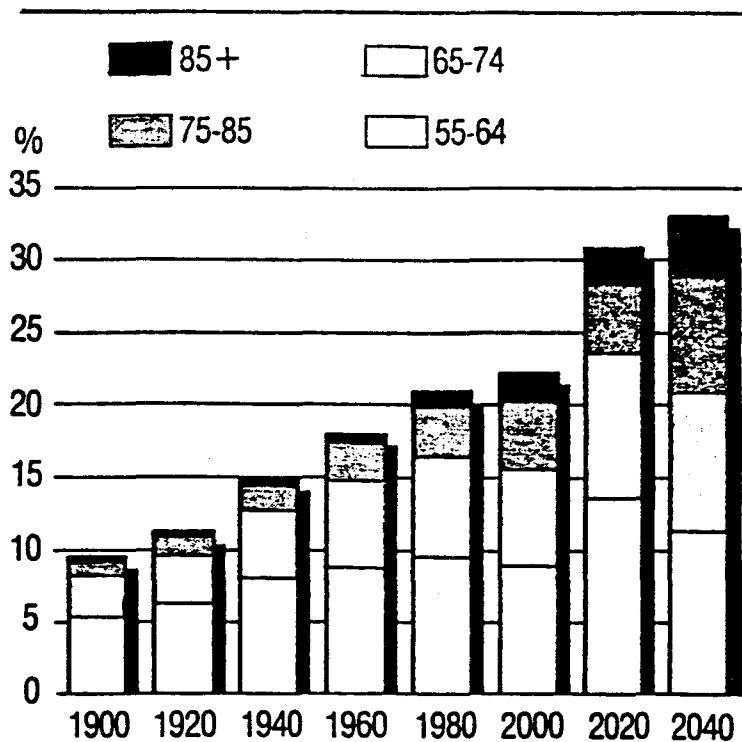
Figure 1. Percentage of population over age 65
(Fowles, Administration on Aging, 1987;
p. 7)

By the year 2000, almost 50 percent of the elderly
will be age 75 or older (Shamioan, 1984). Americans over
the age of 85 will make up what is expected to be the
fastest growing age group in the country. This group will

increase over the next 50 years from approximately 2.2 million in 1980 to more than 16 million by 2050. Another census estimate shows that almost a quarter of the population will be 55 and over by the year 2010 (Altman, Lawton and Wohlwill, 1984). By the year 2030, there will be approximately 65 million older persons, two and one-half times their number in 1980. If current trends in fertility and immigration levels remain stable, the only age group to experience notable growth in the coming century will be those past the age of 55. By the year 2000, persons 65 plus are expected to represent 13 percent of the population and this may climb to 21.2 percent by the year 2030. Sinse the number of elderly Americans is rising, it stands to reason that the absolute number of elderly who have reduced abilities is also on the rise.

Design Implications   Due to the future shift in population composition, there is a great potential for designers to make a difference in housing for the elderly. Done properly a design that is accessible will remain usable for the individual throughout his/her life span. With our aging population composition, an approach to the total life span will become the more recognized method of design. During the next 40 years, designers need to develop a conceptual premise for design that focuses on accessibility.
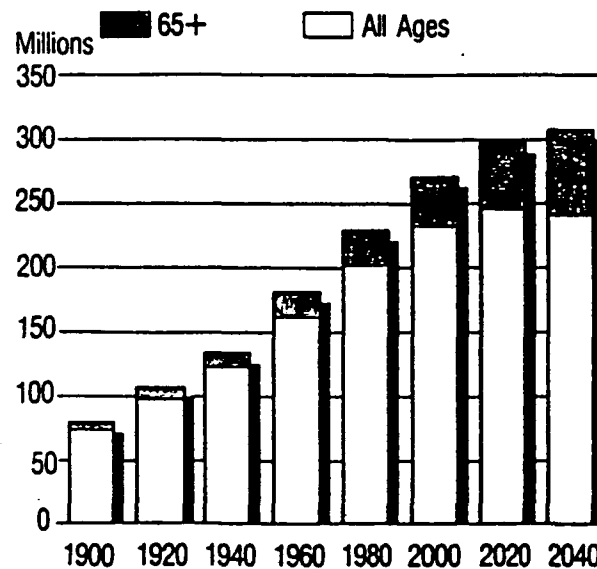
Figure 2. Elderly as a percentage of the total U.S.

population (Fowles Administration on Aging,

1987; p. 1)

Housing trends   According to Hare and Haske (1984),

90 percent of all elderly persons live in independent

households (single family homes or apartments) within the

average community. Ten percent of all elderly persons are

living in some type of planned retirement facility. Half

of this group live in nursing homes and the other half

live in planned retirement communities. However, the

number of elderly persons living in some type of planned

retirement facility may actually be larger due to

inaccurate national findings and an overlap in definitions

of retirement communities and nursing facilities.

In 1980, there were approximately 20,000 nursing

homes with 1.5 million elderly persons residing in them.
It is anticipated that the number of residents will
increase from the 1.5 million in 1980 to 5.2 million by the
year 2040 (Fowles, Administration on Aging, 1987). It is
reasonable to assume, based on the demographic shift that
housing in the elderly community will have to accommodate
an increasing, and diverse comsumer market. The projected
shift will generate many new questions and approaches to
designing care facilities for the elderly.

Care Facilities for the Elderly

Population characteristics

A review of the research on care facilities for the
elderly reveals useful information on what is currently
occurring in care facilities. Although less than 10
percent of the elderly population may be institutionalized
at any one time, it has been estimated that from 25 to 75
percent are placed in a facility setting during a part of
their later years (Lawton, 1981).

One-third to one-half of all nursing home residents
remain three months or less. About half of these short-
term residents expire during their stay and about one-half
return home or are transferred to another health care
facility (AIA Task Force on Aging, 1985). Almost 20
percent of all deaths among the elderly occur in an

institutional setting (McPherson, 1983).

Approximately 72 percent of all nursing home residents are over the age of 85 (AIA Task Force on Aging, 1985). The average age at entry is 82. The most likely reasons given to be institutionalized (voluntary or involuntary) ranked in order of most likely to the least are as follows (McPherson, 1983, p. 307):

1. those who no longer have an adequate degree of physical or mental ability to continue living independently

2. are very old,

3. have no family,

4. live where community services are unavailable, and

5. are financially disadvantaged.

Nursing homes must develop a social and physical environment that will accommodate the growing number of the very old (85 and above). When designing a facility, the designer should become familiar with the specific attributes of this specialized user group. Residents of these facilities all share, to varying degrees, certain age and nonage-related limitations. The designer's challenge is to de-emphasize the effect of limitations through an appropriate environment and therefore limit the effect of a disability.

Types of care facilities

The increasing size of the elderly population has led to an increase in the number and variety of care facilities. Most definitions of facility types overlap so that characterizing all of them becomes impossible. However, most sources have isolated the most common facility types and treat them as landmarks. The five landmark facility types considered by most sources are as follows (AIA Task Force on Aging, 1985; Gwyther, 1985; McPherson, 1983):

1). Elderly housing

2). Senior/community centers

3). Residential care facilities

4). Nursing homes

5). Continuing care retirement communities

1. **Elderly housing**   Elderly housing refers to types of independent and semi-independent housing facilities. Residents are able to care for themselves without supervision and medical attention. The range of housing extends from resident-owned single-family houses to multiunit housing projects and congregate housing (AIA Task Force on Aging, 1985).

2. **Senior centers**   Senior centers are primarily neighborhood community centers geared toward the needs and characteristics of a specific community's population.

Senior/community centers are social, recreational, educational, and communication centers for older persons who enjoy getting together (AIA Task Force on Aging, 1985).

3. Residential care facilities These facilities provide a level of care which is appropriate for an elderly person who can no longer maintain a fully independent life-style, but does not need the level of medical services provided by a nursing home. Residential care facilities are usually licensed by the state department of social services, while nursing homes are licensed by the state department of health. Residential care facilities have recently become a feature in the growing number of continuous care facilities. A wide range of services is provided in a residential setting that includes help with personal needs, assistance with housekeeping, administration of medication, and supervision with the basic activities of daily life. Medical and nursing care are not provided.

4. Nursing homes These are health care facilities licensed by the state to provide long term nursing care as well as custodial care, meal services, housing, and housekeeping. It is widely accepted that long term care facilities are the best alternative for older persons who can no longer manage more independent environments. Nursing homes typically have various levels of nursing

care. The levels of care are composed of skilled, intermediate, and residential care. Interior spaces are usually divided according to the levels of care provided. Usually the skilled care unit (SCU) has the highest level of care available (AIA Task Force on Aging, 1985).

Skilled nursing care   Skilled care units (SCU), provide for all the needs of a resident up to and including total 24-hour care. Residents at this level may be recovering from a hospital stay and are in need of complete personal care. Skilled care is also for individuals needing oxygen. Special supervision may be required due to medications or difficult behaviors associated with more advanced phases of dementias.

Intermediate care   Intermediate care units (ICU) are for those who need some nursing care, yet do not require the amount of supervision offered at the skilled level. Assistance is generally needed with dressing, bathing, walking, or eating. Supervision of medication is ocasionally needed.

Residential care   Residential care units (RCU) are for those elderly individuals who are self-sufficient, but may need minimal supervision with some aspects of daily living. Planned activities, regular meals, housekeeping, and laundry services are all provided. The cost for residential care is usually far less than it is for skilled

and intermediate nursing care, although it is still
substantial.

The AIA Task Force on Aging (1985) has categorized
residents of nursing homes into three major groups:

1. Group one includes the terminally ill older
    persons who have been discharged from a hospital.

2. Group two is made up of older persons recovering
    from surgery or fracture who have been discharged
    from a hospital.

3. Group three is made up of medically stable but
    functionally impaired older persons who have
    usually been admitted from their homes.

There is a general agreement that long-stay nursing
home residents (making up the majority of nursing home
populations) are primarily from the third group. Space
allocations, services, and equipment are usually controlled
by the requirements of state and/or federal codes due to
the reimbursement of resident care costs under the Medicare
and/or Medicaid provisions of the Social Security Act.
Government facilities, proprietary facilities, and those
operated by chains may also have definite program and space
requirements. This may lead to a more restrictive and
monitored environment very similar to a "medical model".

5. Continuing care retirement communities (CCRCs)
Continuing care retirement communities, are based upon the

concept of continuum of care. CCRCs allow residents to lead independent life-styles, while long-term health care is available to those who may need it occasionally or on a regular basis. Most CCRCs provide independent housing, residential care, social services, a senior/community center, and nursing home care within one development. The attraction of CCRCs comes from the wide range of services offered and the smooth transitions between levels of care. CCRCs have greatly expanded upon the concepts of nursing home care. Elements of a CCRC may vary, but generally there is a community center which functions as a senior center. Depending upon the market in the surrounding area, CCRCs may have additional facilities of adult day care and medical offices. Older persons begin to move into a CCRC when they are fairly healthy and active. A temporary illness or debility usually provokes the changing living arrangements. Most CCRC residents move in with plans to stay for the rest of their lives. Older persons moving to a CCRC may stay for a period covering 30 to 40 years (AIA Task Force on Aging, 1985).

Fewer facilities are operated by religious or voluntary groups than in the past mainly due to increasing expenses. Most facilities for the elderly are now operated by chains as profit-oriented enterprises. As a result, the quality of care may vary greatly. It becomes the

designer's role to provide an environment that is supportive to a growing and diverse group of users.

Understanding Alzheimer's Disease

The growing importance of dementing illnesses as a major public health problem has only recently received significant recognition (Mortimer and Schuman, 1981). Of the chronic disorders, none is feared more than the loss of memory and cognitive function that is the hallmark of dementia. It is estimated that 5 percent of the U.S. population 65 or over is severly demented. Another 10 percent may be moderately impaired. According to some estimations, two-thirds of the demented population are taken care of at home, whereas the other one-third are cared for by institutions. Currently, nothing can be done to cure some dementing illnesses. Yet, much can be done to make life easier on the person with the illness, as well as the care provider.

Dementias are classified as brain diseases that result in the progressive loss of mental faculties, usually beginning with memory, learning, attention, and judgment. All result in confusion that poses great difficulties for those who suffer from the condition. Alzheimer's (named for the German physician who discovered it in 1906) is the most common form of dementia which affects more than 2.5 million Americans. As the disease progresses, individuals

suffer from a number of symptoms which frequently culminate in institutional care. Reduced cognitive functioning caused by dementia is one of the principle reasons why elderly persons enter nursing homes.

AD currently affects more elderly persons than any other disease that causes cognitive impairment. Sources state that it is the fourth leading cause of death among the elderly, after heart disease, cancer, and stroke. Persons do not die from AD, but from complications brought on by the degenerative disease (Powell and Courtice, 1983).

AD usually develops in older individuals over the age of 50, but can strike individuals in their 40s and younger. Usually the younger the age of the inflicted individual, the faster pace of progression the disease takes. The youngest known victim was 28 years old.

Physiology of Alzheimer's

AD is a disease that involves degeneration of neurons in the brain cells. The tissue changes characteristic of the disease are neurofibrillary tangles and neuritic plaques. These occur mainly in the outer layer (cortex) of the brain and in the hippocampus areas important to memory. Neurofibrillary tangles or "tangles" are abnormal nerve cells. Neuritic plaques or "plaques" are deposits of amyloid, a waste material. Aronson (1982) states that diagnosis of dementia is usually suggested by a history of

forgetfulness, repetitiousness, and losing one's way.
There may also be a loss of ability to perform complex
tasks. Although a decline in all phases of cognitive
functioning is the central feature, changes in the emotions
and personality traits are usually the most noticed.

Symptoms of Alzheimer's disease

Many researchers describe the phases of AD as being
insidious. AD can progress quickly over three to
four years, or slowly, over as long as 15 years (Powell and
Courtice, 1983). Prognostic studies show that
approximately one-third of the persons afflicted with AD
decline quickly; they are institutionalized or dead within
3 years. Another third become worse but can still function
in the community, and one third seem to remain at the first
phase for 3 years or longer (Reisberg, 1984). Usually the
afflicted person is far along by the time the disease is
diagnosed so that little can be done in the way of
treatment. Although this disease is gradual, several
researchers have classified four phases of the disease as
follows:

1. Phase one involves gradual and continually
progressive failure in work performance and some of the
common activities of everyday life not due to impairments
in general health. According to Powell and Courtice
(1983), at this phase relatives may not be sure what is

going on with the person. He/she would appear to have a loss of energy and be slower to react and learn new things.

2. Phase two is characterized by impairment in memory, with difficulty in recording and retrieving recent experiences. A hallmark of phase two is the slowing of speech. During this phase one may be unable to calculate or need help balancing a checkbook and decision-making becomes difficult.

3. Phase three is characterized by deterioration in the general intellectual ability of a person. Of primary concern is an impairment with the capacity for reasoning. Interference with conceptual and abstract thought becomes more evident. Powell and Courtice (1983) claim that by this phase, the person with AD loses his/her orientation to time and place. The person is not able to identify familiar events or people. By this time a person displays apathy, seeming to be totally insensitive to the social and physical environment. During the third phase, wandering usually occurs and supervision is needed most all of the time.

4. Phase four is characterized by the disorganization of personality. Features a person displays during this phase are distinctive. This individual is unable to find his/her way about once familiar surroundings and needs help

with all of the activities of a day to day world. This phase is of most concern to environmental designers. According to Lawton and Nahemow (1973) the lower the competence an individual possesses, the more likely he/she will be influenced by changes in the environment. The sufferer of AD during phase four is in need of specially organized care and specially designed surroundings.

By understanding the care recipient with these characteristics, a designer is better able to give recommendations which support the care providers of a nursing home. It is characteristic of AD that the symptoms change or vary from person-to-person, and sometimes from day-to-day in the same person. No single symptom or behavior is completely predictable. However, recent memory loss seems to be universal in all phases of the disease.

A 1987 review of AD by the U.S. Office of Technology Assessment (OTA) predicted that by the year 2040 there will be a five-fold increase of persons who suffer from this disease, with over 7.4 million Americans afflicted. Surveys conducted through OTA of nursing home residents find that, at least, one-half have some form of dementia. Currently, most dementia sufferers live in long term care facilities at the later phases of the disease.

Care provider stress

Care provider stress is the stress suffered by the individual who cares for the person with AD at home, the institutional or facility level. The stress of providing care for a resident with AD at home has been extensively studied in recent years. An article by the U.S. Congress Office of Technology Assessment (1987, p. 7), states that "from the moment of diagnosis of dementia to the end of life, patients and families are subjected to pressures and strains that rarely let up."

The changes in personality and behavior of a demented person can be exhausting and frustrating for the care provider. The care of the institutionalized resident is extremely difficult, due to the fact that residents are usually far along in terms of the disease process. Burnside (1982) states that the behavior seen in AD residents parallel, to some degree, those seen in psychiatric patients: paranoia, depression (more evident during early onset of the disease), and abnormal behaviors synonomous with behaviors seen in psychotic schizophrenics. According to Burnside, one real danger is that of staff burnout. Conscientious workers try so hard that they finally feel that they have given their all and resign, transfer, or remain and experience lower job satisfaction.

It is the premise of this research that much can be

done to make life easier for the person with AD and for those who care for that person by developing a supportive relationship with the physical environment.

Dementia programs of care

The more progressive programs in long-term care for residents involve nursing home administration, staff, and families working together to provide effective services. Nationally, long-term care facilities are beginning to develop special services for persons with dementia. Preliminary national data from OTA (1987) suggest that currently 1-2 percent of nursing home residents with dementia are in special care units. Defining models for effective special dementia services is in its infancy with early efforts focusing on the training and teamwork of the nursing home staff. Other models include redesigning rooms and common areas to cue associations and channel behaviors; The programming of activities which rely on remaining abilities as well as past and current interests and the family members of AD residents in planning and giving care to the resident (OTA, 1987).

Study of staff views towards dementia residents

Reever and Koerner (1987) conducted a study of several long-term care facilities in the Philadelphia area which reported at least 50 percent of the nursing home

populations have some form of dementia. When the household
is no longer able to bear the responsibility of fully
caring for a household member with AD, the elderly person
is usually placed in a residential care facility or nursing
home. The ability of the elderly person to maintain a
level of independence results in a longer period of time
spent in a residential care facility rather than a nursing
home.

A collection of views by Reever and Koerner (1987)
from administrators, directors of nursing, and activity
directors on current policies and practices of nursing
homes in caring for residents with dementia has shown that
the staff was most likely to use information given prior to
admission to determine the resident's physical and mental
status. Staff (68 percent of the staff polled) used
transfer records and physician's referrals to identify a
resident having dementia. Only 4 percent of the staff
reported that they used a mental status questionniare in
determining if a resident had some form of dementia.
Identification of special needs of the resident with
dementia was equally likely to be made from assessments at
admission or from a combination of the above three methods:

1. transfer records and physicians referrals,

2. mental status questionnaire,

3. assessments at admission

Statistically, the most accurate method for
identifying a resident with dementia comes from a mental
status questionnaire given by qualified staff. Many types
of dementia, including AD, are usually mistaken by doctors
to be signs of a deficient diet or depression. Therefore,
doctor's referrals should be closely analyzed.

Policies towards dementia residents

Policies   According to a study of Philadelphia
nursing homes by Reever and Koerner (1987) few staff
members and administraters reported having a special policy
for residents with dementia, such as placement in a
demential unit. Several staff members explained that in
their nursing home, dementia residents were intentionally
integrated with residents who did not have cognitive
impairments. Other studies have shown that integration of
this type can cause depression in residents who do not have
any type of dementia (McPherson, 1983).

Methods of treatment   This same study reported that
the most frequently reported activities to help dementia
residents use their remaining abilities were reality
orientation, music, simple crafts, games, and exercise
(Gwyther, 1985). The techniques used to help the dementia
resident function at the highest possible level included
working one-to-one with the resident, helping the dementia
resident participate in group activities, encouraging

independence, and using information from their family concerning past interests and appropriate care techniques. Indicated by the facilities in the case studies, results of these types of mental coaching have benefits no matter how minimal. As the disease progresses, however, AD residents become increasingly difficult to reach.

One cannot disregard the implication that the above information has on the design process. The environment can facilitate the care techniques of the staff by becoming a reinforcing backdrop to the daily therapeutic activities of staff. Familiar surroundings become a catalyst to those activities, by enhancing a sense of control a resident may feel over his/her environment. A designer who is familiar with the positive reinforcing techniques of staff is better equipped to develop an appropriate environment.

Problems reported in caring for dementia residents varied with the type of staff personnel. Administrators and Directors of Nursing considered wandering and agitation the most difficult problems to deal with. Activity directors on the other hand reported memory loss and communication as the major problems (Reever and Koerner, 1987; Gwyther, 1985; Green, 1987).

The study conducted by Reever and Koerner (1987) and information obtained through the case study facilities, indicate the most common recommendations by staff to help

them in working more easily and effectively with dementia
resident are, in order of importance, 1) more training, 2)
more staff, 3) better management techniques, 4) appropriate
environments, and 5) better reimbursement through Medicaid
for the nonmedical care required for dementia residents.

Behavior   Confusion and disorientation with respect
to time and place often result in disruptive behavior such as
wandering. Dementia residents are also often unable to eat
and perform personal care without some form of assistance.
The constant need for supervision leads to dramatic
financial increases in health care costs. If nursing home
boards and administrators do not respond to the problems
A) associated with costs and B) methods of caring for,
dementia residents quickly enough, and as our society grows
older, the problem will become much more evident.

The design of the physical environment can affect or
aid the welfare of dementia residents. Providing an
environment with a high degree of cognitive clarity
(defined as readable and easily imageable) can help
dementia residents achieve a greater sense of control over
their lives.

Publications to date on the welfare of dementia
residents all seem to point to a greater need for
cooperation between family and staff. Dementia and the
behavioral patterns of AD residents, all seem to point to a

combination of differing variables of influence. A care program that incorporates methods of intervention involving Administration, Directors of Nursing, other staff, and family appears to be able to have the strongest potential for benefitting the lives of dementia residents.

Publications Dealing with Environmental Design Guidelines for Persons with AD

Publications dealing with AD have tended to focus on the biology and the behavioral effects of the disease. Recently, there has been a focus on the role of the environment in shaping the lives of persons with AD. The following publications have identified behavioral effects of AD and have extrapolated environmental interventions.

Several of the publications cited have a similar methodology pertaining to design issues (Reever and Koerner, 1987; Calkins, 1988; Roll, 1986). The authors have interviewed primary care providers (on the facility level). They have also attempted to bridge the gap between researcher and designer. Currently much of the published research by psychologists and social scientists is not presented in a way that allows the designer to practically apply the results. Basically designers synthesize gathered information, whereas researchers analyze information. Difficulty appears when a transference of information is required. Designers are mainly concerned with how things

ought to be. On the other hand researchers are able to control their environments and remove many of the independent variables affecting the problem. It is the opinion of the author that the following publications have presented research in a way that the reasoning justifies design suggestions.

Design for dementia

The focus of the publication by Margaret P. Calkins is on special care units for the cognitively impaired. However, Calkins states that many of the derived design criteria are applicable to other settings as well (Calkins, 1988, p. XXIII).

Calkins' approach to design is not based upon one individual's research. Studies by pioneering social scientists pertaining to the handicapped (physical and mental) and elderly (cognizant and incognizant) were utilized and refered to for design decisions. Applying information from a wide variety of sources allows for diverse approaches to environmental interventions. Due to the wide variety of information in this book, it cannot be viewed as a cookbook of design solutions. As the author states,"... one cannot just put the various ingredients together and come up with the "right" answer or "best" design for a special care unit" (Calkins, 1988).

The environment-behavior relationship

The author divides the subject into two sections. The first section, discusses issues dealing with environment-behavior relationship. The environment-behavior relationship generates from a study conducted by M. Powell Lawton (Director of Research, Philadelphia Geriatrics Center) in 1981. The study concluded that through the creation of a supportive physical environment, a "lack of decline in basic indicators of competence occurred in persons with AD" (Calkins, 1988; p. 22). What this means is that, although it is not possible to halt the progression of dementia in a person, it may be possible to slow the rate of decline through the utilization of a supportive physical environment.

Prosthetic environment   The term "prosthetics" used as a keyword by Calkins (1988) is defined as "devices or elements which provide additional functional support to compensate for limited physical or other capabilities" (Calkins, p. 33). The "additional functional support" is achieved through additional environmental information such as way-finding cues. The primary basis for Calkins' design guidelines emerges from the environment-behavior relationship described by Lawton (1981).

Environment as a prosthetic support

Specific strategies for dealing with this relationship
are presented in the second section of the publication. The
strategies range from the importance of supplying a
residential character to the surroundings (reminding one of
home) to the use of the environment as a prosthetic support
(additional functional support) for the activities of daily
living. Environment-behavior factors (Lawton, 1981) of
1) way-finding/orientation, 2) privacy and socialization,
3) personalization, 4) safety/security and 5) activities of
daily living are applied as prosthetic supports for
specific areas of an AD unit. Calkins is quick to point
out that not all of the five factors are applicable to each
area. For example when dealing with the dining room the
emphasis is placed on factors of way-finding/ orientation
and activities of daily living. Behavioral issues are
outlined, according to research conducted by the author,
and then the design response is given. Behavioral issues
concerned with a dining room are as follows: the fact that
persons have developed eating patterns over the years with
which they are comfortable and partial to. Continuation of
these patterns decreases agitation in a impaired
individual. Another behavioral issue stems from the fact
that, in a nursing care facility, mealtime requires high
amounts of concentration and is usually one of the most

demanding times of the day. Interventions that will reinforce the eating process while reducing potential distractions will benefit both resident and staff member.

The design responses to the above behavioral issues would come under the factors of activities of daily living and way-finding/orientation. The design responses include techniques for increase visual acuity. Residents may not be able to discern objects on the table lending to a growing sense of agitation when trying to eat. Applying visual contrast between table and plates may relieve some sense of frustration. Suggestions for group sizes are offered that may lend to a more territorial feeling when sitting at a dinner table rather than cafeteria style. It is suggested that facilities should consider alternatives to the central dining room theme.

Finally the author introduces a design review checklist. It is intended to be used as a rating scale to evaluate the environmental characteristics of existing or proposed units. The checklist is divided into segments each concerned with individual areas of a AD unit such as bedrooms, corridors and shared living areas among others. In general, the intention of this publication is to serve as a tool that enhances communication between all parties involved in the creation of a AD unit.

Patterns for Institutions

The publication, Patterns for Institutions: A
Behavioral Approach to Designing Facilities for AD
Patients, is a masters thesis written in 1986 by Mary Kay
Roll. The purpose of this study was to develop a series of
design aids for facillities housing AD residents. A
graphic translation is created between research findings
and design applications. Graphic translations are in the
forms of "patterns". According to Roll a pattern is
defined as a "solution to a problem that occurs or can
potentially occur in an environment. It is a graphic
representation of the problem associated with a verbal
design guideline and presented in such a manner that the
solution can be used over and over again without ever
achieving the same physical manifestation" (Roll, 1986;
p. 1). Combined, these patterns form what Roll refers to
as a design aid workbook.

Conceptual framework   The major format of Roll's
thesis is based upon work by Dr. Pastalan and Dr. Berlyne.
Pastalan (1977) stated that the housing environment needs
to be organized in terms of at least three dimensions: "1)
organized space as stimulus - getting the message across
through stimulation techniques such as redundant cueing; 2)
organized space as orientation - a space should have a
singular, unambigious definition and use; and 3) organized

space as mastery (e.g., safety and convenience) - designing spaces which facilitate individuals with reduced abilities to claim and defend spaces as their own" (Roll, 1986, p. 19).

Pattern organization   Derived from Pastalans' work, the patterns presented in this thesis are organized into one of two sections; stimulation or orientation. The section dealing with mastery is not covered due to the author's opinion that there is already much written dealing with the subject of organized space as mastery. Stimulation patterns pertain to space organized as stimulus. The section on stimulation is broken down into categories of visual cueing (illumination and color perception), auditory cueing (noise control, music stimulation, etc.) and tactile cueing. Patterns on orientation refer to space that is organized to have a singular unambigious definition and use. Orientation patterns are subdivided into signs and numbers, visual access, architectural differentiation (landmarks, corridor appropriateness, etc.) and plan configuration (Figure 3). It is within these subdivisions that the patterns occur. Each subdivision is organized to contain a review of relevant literature and is followed by an illustrated solution (pattern). The number of patterns in this thesis is based upon the complexity of the individual subdivision

and Roll's literature review.

For example, (Figure 3) under the section on stimulation (Pastalan) the category of visual cueing is explored. Patterns are developed under the category of visual cueing relating to the subdivisions of illumination and color perception.

The patterns relating to illumination deal with object size, quality of light (task light, illumination levels, etc.), and amount of glare (different surface treatments, methods to limit direct glare in eyes, etc.). Each of these topics has a graphically illustrated pattern associated with it. All of the patterns mentioned in this thesis maintain a general application. The author developed individual patterns using little detail in the solutions. This type of approach avoids a myopic view to situations and enables the solution to be used over and over without, as Roll states, "achieving the same physical manifestation" (Roll, 1986, p. 1).

Both of the publications cited above attempt to deal with the behavioral problems associated with dementia from a environmental stance. Some solutions may be more successful than others. Whatever the result, one must remember that no solution will succeed without the input of the primary users of a space: the residents and staff.

FRAMEWORK		
STIMULATION	**ORIENTATION**	**MASTERY**
Space organized as stimulus	Space organized such that it has a singular unambigious definition and use.	Space organized to provide safety and convience to the individual user.

A. Visual Cueing
  1. Illumination
 	
    Object Size
    Quality of
      Illumination
    Amount of Glare
 	
  2. Color Perception
 	
    Color Effects
    Color Palettes
    Color Placement
 	
B. Auditory Cueing
 	
  Noise Control
  Sound Amplification
  Music Stimulation
 	
C. Tactile Cueing
	A. Signs and Numbers
	
	  Coherent Signage
	    System
	  Latent Signage
	  Reality Orientation
	
	B. Visual Access
	
	C. Architectural
	    Differentiation
	  Visual Distinctive-
	    ness
	  Establishing
	    Landmarks
	  Corridor Appro-
	    priateness
	  Wing/Level
	    Distinctiveness
	
	D. Plan Configuration
		Not addressed in this thesis. However, some good resources are:
		
		Raschko, B. Housing Interiors for the Disabled and Elderly, Van Nostrand Reinhold Co. Inc.: New York (1982).
		
		Koncelik, J. Designing the Open Nursing Home, Dowden, Hutchinson & Ross, Inc.: Stroudsburg, Pennsylvannia (1976).

Figure 3. Conceptual framework (Roll, 1986; p. 13)

Conclusion

From readings it appears that the need to develop environmental design suggestions basically stems from three separate but interwoven factors:

1. The loss of cognitive functions by AD residents - requires increasingly heavy care from staff members, plus an easily readable physical environment. Lawton (1981) proposed that behavioral outcomes of persons are based on the assumption that the more competence a person has, the less likely he/she is influenced by changes in

the environment. Conversely, the lower the competence a person has, the more likely he/she is influenced by changes in the environment.

2. A general lack of environmental stimuli, i.e., the "medical model" of design can result in sensory deprivation for the AD resident (Burnside, 1982). Due to space allocations, services and equipment controlled by, A) the costs for and, B) the requirements of state and/or federal codes, the design of the physical environment contains little ingenuity. This culminates in a more restrictive and monitored environment by which custodial care (meals, laundry, etc.) is the primary form of care (AIA Task Force On Aging, 1985).

3. The stress placed on overworked care providers who become interpretors for a confusing environment requires addressing. Readings refer to the institutionalized resident as needing "heavy care", due to the fact that residents are usually far along in terms of the disease process (Gwyther, 1985). The physical environment must become a supportive element in the therapeutic care provided by staff members.

Summary   Residents who have AD are usually not certified for skilled reimbursement rates from Medicaid or

Medicare. However it is apparent, through readings and case study investigations, that the majority of AD residents are placed in the catagory of skilled care (varying termonology is used e.g., exceptional care etc.). Most care required by AD residents is not the acute skilled care/high technology type. Staff are forced to redesign care-plan goals and to work much closer with the residents' family, relying upon current experience with similiar residents and current understanding of the downhill course of AD.

In conducting the following case studies, the intent is to begin looking at how the care given by staff members can better interact with the environment. Observations and interviews with the staff members who closely relate to AD residents enabled the author to determine physical elements that influence the relationship between resident and staff member. The resulting design suggestions will be site specific.

CASE STUDIES

Project Approach

Four case studies were conducted in order to determine the specific needs of the staff who care for AD residents. The objective of the case studies was to document a sample of long term care environments for AD residents, to suppliment information gained from the literature review and, to provide input into the development of schematic design suggestions. Through the use of these case studies, issues that arose in the day-to-day care of an AD resident were identified.

To obtain data, short duration post occupancy evaluations were conducted. Post occupancy evaluations (POEs) are useful in generating data on building performance which can be employed in the programming and design of new facilities (Osterberg, 1981). Research techniques included photography, observations and interviews. Attempts were made to recognize the fundimental issues and basic performance of the projects without involving an extensive time commitment. Issues of safety, adaptation and/or control over surrounding environments, and perceptions of that environment were explored. Methods for investigating issues included a study of social areas as related to the effects of spatial arrangements, observations of social behavior, and unit

layout. Interviews with program directors, nursing staff, and other employees were conducted. Attitudes and suggestions for the routine care of AD residents were documented.

Project Locations

Four examples of long term care facilities were visited in Colorado and Illinois. The Colorado population varies from Illinois. Colorado is a state with a diverse group of elderly individuals who have migrated from surrounding states, whereas Illinois' elderly population represents mostly individuals who have remained in the same state most of their lives. Both states are attempting to be pioneers in the field of health care for nursing home residents with AD.

Heather Manor

Heather Manor is a nursing care facility located in a residential area of rural Colorado. The administration refers to the project as a continuing care facility, somewhat similar to a CCRC defined in the literature review. However, there is no retirement/community center located on the site. Heather Manor is actually a nursing care facility offering various levels of care. The levels of care range from skilled and intermediate care, available for residents with AD, to adult foster care, daycare and

alternative care available to the entire elderly population.

The main structure at the facility was originally an office complex for an oil company. The structure was converted into a nursing care facility in 1983. Unfortunately, the only adaptations that were made to accommodate residents and staff were those required to fulfill the minimum standards and codes. The remaining facilities for daycare, alternative care, and foster care are housed in separate buildings on the complex.

Layout of care facility   The nursing care facility for AD residents is layed-out with a small lobby area off the main entry which serves as a central connector for the east and west building wings. Centered around the lobby are the dining room, an activity/chapel area, and care units (Figure 4). The skilled and intermediate care units extend from the east and west ends of the lobby area. All of the resident's rooms are double occupancy (Figure 5).

Because Heather Manor was an adaptive reuse of an office building, it tends to have an institutional appearance. The exterior of the nursing care facility continues to convey the designer's intention - an office complex. The institutional appearance is evident throughout the brick clad, one-story structure including

the finish materials on the interior. For example:

1. Carpeting is not present anywhere in the
    facility.

2. The floor treatment uses the same tile pattern
    for the corridors, resident's rooms, and lounge
    areas.

3. The corridors are extremely long and contain no
    distinguishing features or landmarks to aide
    residents with orientation.

4. There are very few wall hangings.

5. The color treatment is the same throughout the
    facility.

The overall physical appearance of Heather Manor does
not correspond with the high quality of care that is given
to residents by the staff members. The fact that codes and
standards were met for the building's adaptation displays a
limited contribution to the type of physical environment
needed by AD residents and staff (pp. 24-25, herein). The
general scheme of the facility is similar to a hospital
(p. 15, herein). The author's observation that the
building is physically inadequate was verified during
interviews with the staff. However, the facilities staff
has an excellent reputation for the high quality of care
they give to the residents.

Outdoor Wandering Area

Fire Door

Fire Door

Nurse's Station

Kitchen

Nurse's Station Lounge Area

Activity/Chapel

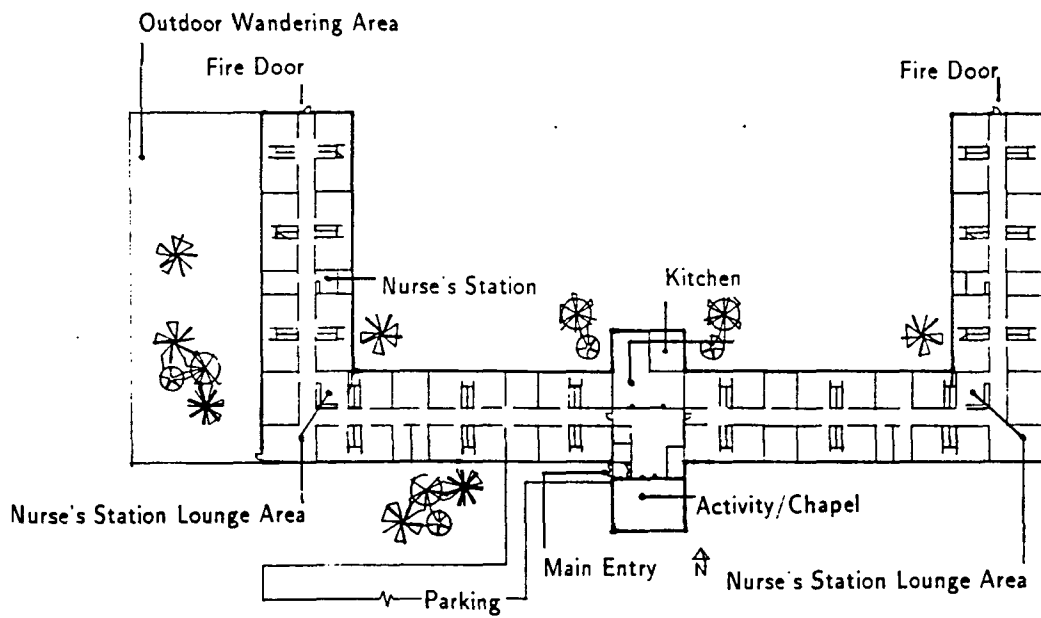Main Entry

Nurse's Station Lounge Area

N

Parking

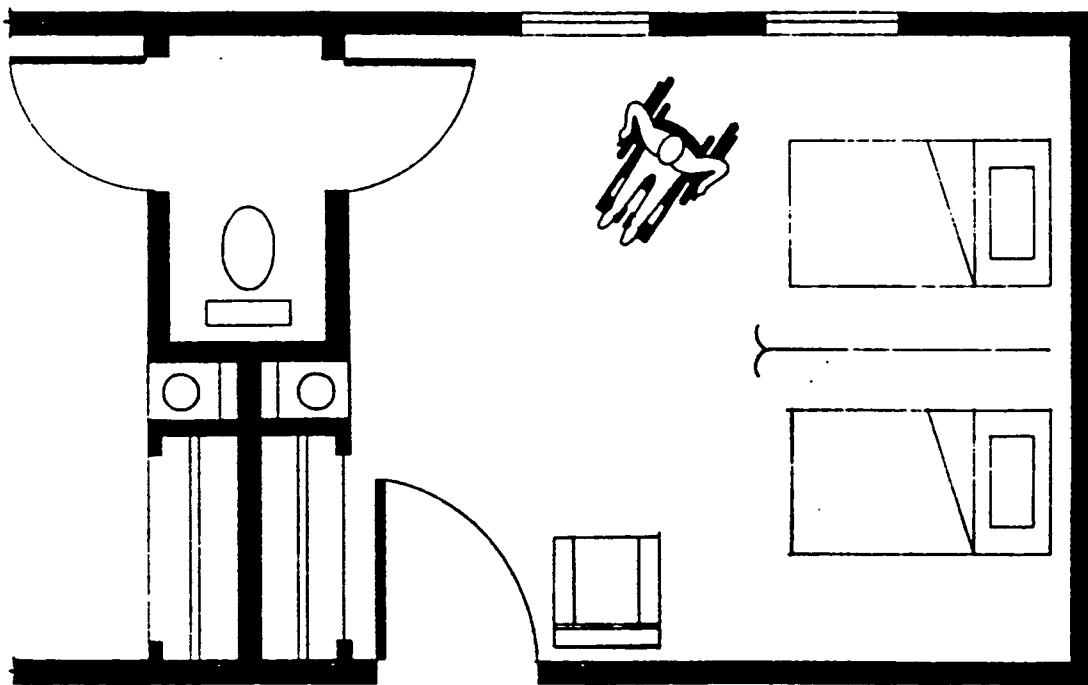**Figure 4. Floor plan of Heather Manor**

Figure 5. Floor plan of a typical resident's room at
Heather Manor

Spatial arrangements of social areas   Each care

wing contains a small lounge located within close proximity

to a nurse's station. The furnishings used in the lounges

consist of brightly colored geri-chairs arranged in a

circular pattern, allowing unobstructed views of a wall-

bracketed television. The position and height of the

television does not allow residents control over

programming (Figure 6).

Lounges   The lounges in both wings are often

filled with residents, a majority of which were observed

sleeping or sitting silently. Very few residents were

engaged in conversation, which is understandable due to the

nature of the population. The staff reported that most

visitors preferred to socialize with the residents in the

activity/chapel room away from the distractions of the

building care wings. Noise was a general problem:

background noises reverberate throughout the facility due

to the use of hard surface materials on the floors, walls,

and ceilings of rooms and corridors.

Nurses'stations and corridors   The interior of

the facility contains long institutional corridors with few

spaces for social gatherings. Yet, the corridors appear

to contain the most activity, especially in the vicinity of

the nurses' station. The corridors contain no

distinguishing features or areas to gather and socialize

without disrupting the flow of traffic. Corridors have a repetitious material treatment with the same tile flooring used in every corridor as well as the same wall treatment (Figure 7). Because of the repeating corridor treatment, there are no obvious cues to aid orientation. Perhaps this contributes to the wandering of residents throughout the facility. Residents do not personalize the doors of their rooms. There are small name plates present on a few of the resident's doors. However, these name plates cannot be seen from a distance of more than a few feet due to the small lettering used.

Levels of care: skilled care   Residents who are in the final phases of AD make up the majority of the 43 residents in the skilled care wing. Complete bed care is provided for those residents who need it. Assistance with daily activities of living such as feeding, dressing, toileting, and ambulation are also provided. A smaller dining area is provided for the skilled care residents who require special attention.

Intermediate care   Residents who are in either the second or third phase of AD make up the majority of the 43 residents on this wing. Because of the activity levels of residents in intermediate care, more time and skill are required from staff who care for them. Each resident has his/her own physician. However, the registered nurses

Wall Bracketed Television

Close Proximity to Nurse's Station
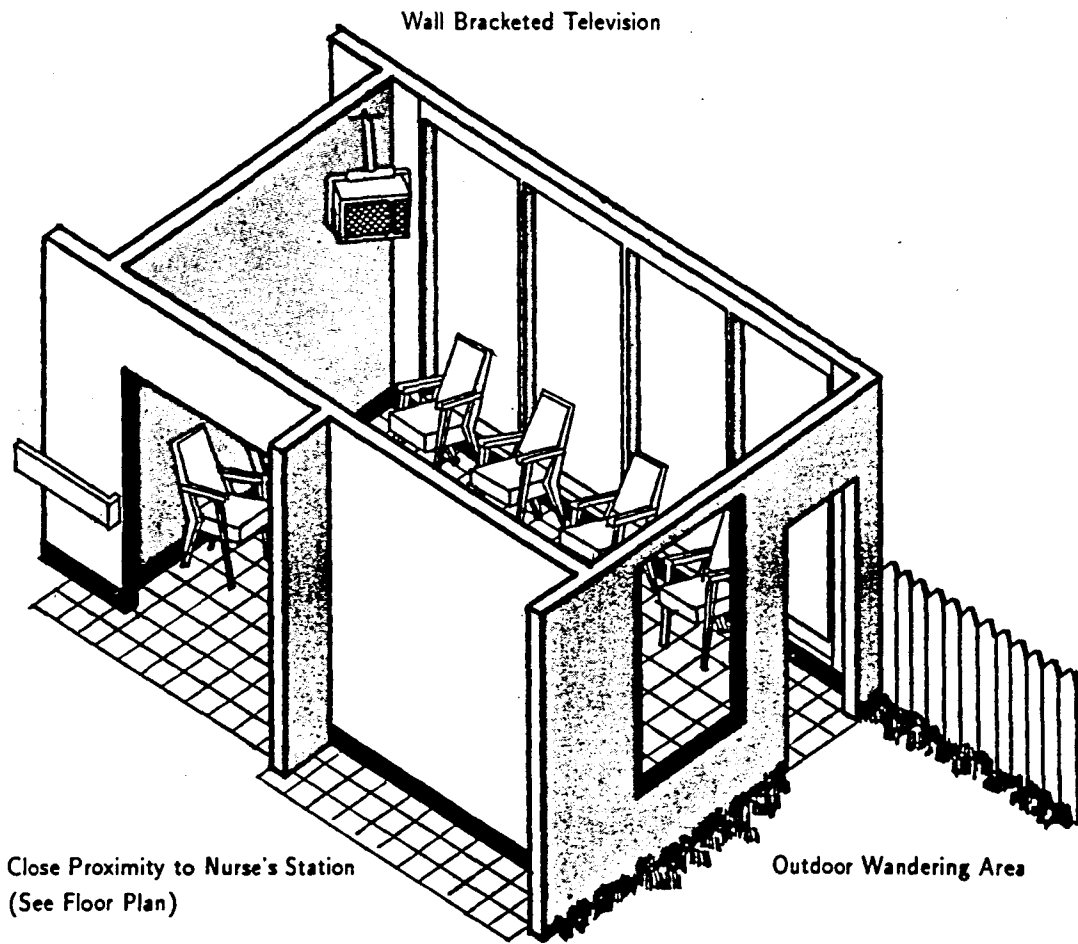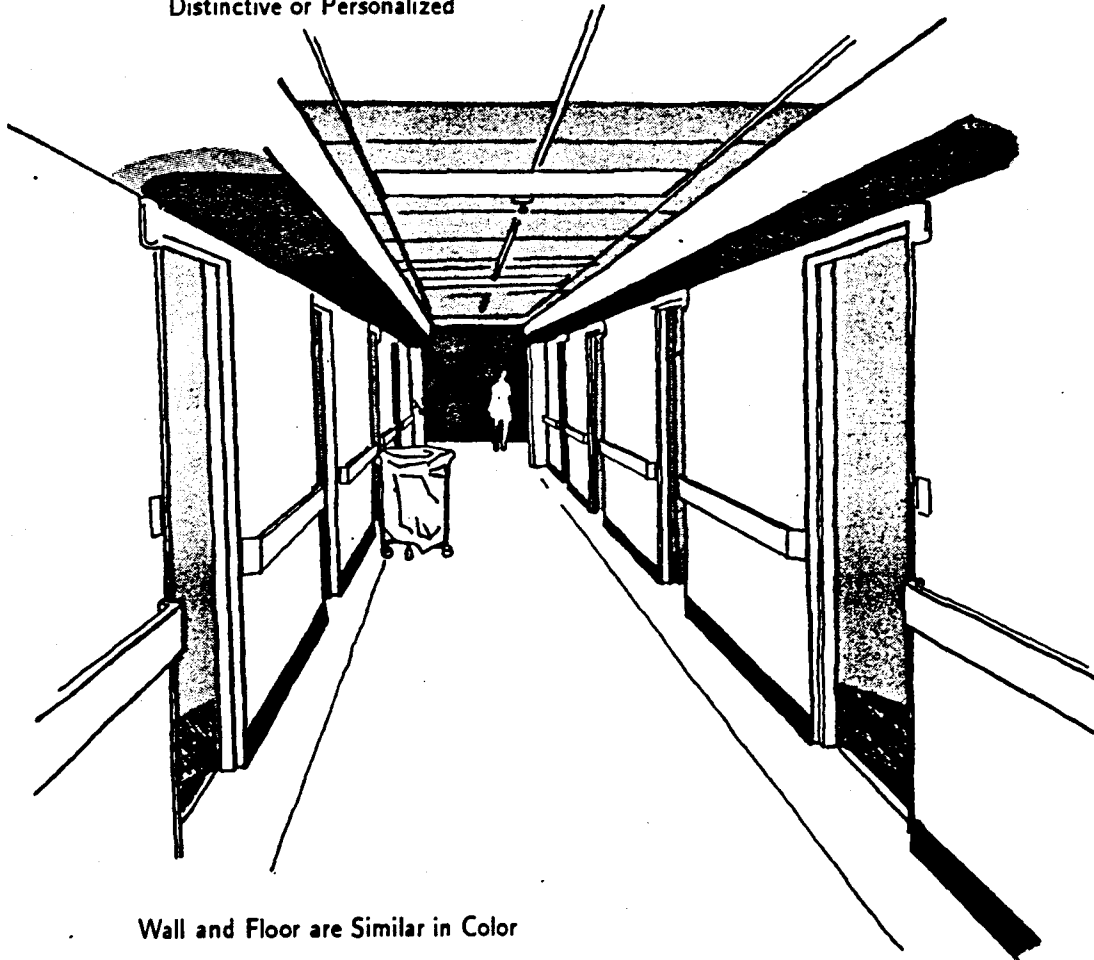(See Floor Plan)

Outdoor Wandering Area

Figure 6. View of typical lounge area at Heather Manor

Doorways of Residents' Rooms Are Not
Distinctive or Personalized

Wall and Floor are Similar in Color

Each Corridor Contains the Same Material Treatment
—No Visual Distinction

Figure 7. View of typical corridor showing material

treatment

control the distribution of medications to the residents.
Assistance with activities of daily living such as feeding,
dressing, toileting, and ambulation are also provided in
intermediate care, but on a more limited basis than in
skilled care.

Alternative care   Residents in alternative
care have various forms of disabilities but are not yet in
need of a nursing care facility. The majority of these
residents are mentally capable of remaining moderately
independent. The staff of Heather Manor believe that
alternative care belongs between the levels of foster and
nursing care. Services provided under alternative care
include:

1. Limited assistance with bathing.

2. Limited assistance with dressing.

3. Provide three meals a day (optional).

4. Provide light housekeeping, including
   resident's laundry.

Adult foster care   Residents in adult foster
care are mentally capable and are aware of their
surroundings. They are allowed to own cars and are capable
of coming and going as they please. Caregiving for foster
care costs $520 a month. Services provided under adult
foster care include:

1. Limited assistance with bathing.

2. Provide three meals a day.

3. Supervised medication.

4. Provide light housekeeping, including resident's laundry.

Daycare   The daycare facility is a separate structure from the main nursing care facility. Elderly persons who utilize the program may stay as long as 6-8 hours a day. The program is open to any elderly person in the community who requires minimum assistance. The program includes:

1. Scheduled activities such as arts and crafts projects and exercise classes.

2. Medical evaluation (optional).

3. Bathing (optional).

Care Routine: staff attitudes and suggestions

Note: The following discussion applies to staff member's attitudes concerning advanced (phase three and four) AD residents. The statements were obtained during a group discussion with ten staff members.

General Response: Staff members believe that AD residents do not need a lot of "things." What is important is keeping the environment safe. Many residents do not know where they are most of the time. Staff report that Alzhiemer's residents tend to mimic behavior from the environment. For example piped in music has a calming affect, while combative behavior from one resident can cause another individual to become aggressive.

Behavioral Issues:

Wandering:

The wandering behavior of AD residents is frequently mentioned as being the biggest problem by staff members. Staff members report that wandering is the main reason why persons are placed in a nursing home facility. Wandering is also the primary reason why AD residents are placed in separate wings. Sundowners (persons whos activity levels rise during later hours in the day) become very agitated in the evenings. Staff reported that wanderers display no noticeable recognition of personal territory. They often wander into areas and rummage through resident's articles.

Due to the strong need for residents to wander, staff members believe that a designated area for wandering would be beneficial for all residents. Safety is of primary concern. An area with no steps or slopes would be desireable, due to the fact that elderly persons shuffle and may trip over small objects when walking.

Catastrophic
Reactions:

Confusion and agitation may occur at any time for no apparent reason. A resident may become over-stimulated and display a very highly agitated state. Confrontations occur in the corridor more often than in resident's rooms. The excessive length of the corridors limits the staff's ability to see the first signs of trouble beginning between residents.

The Physical
Environment

Nurse's Station:

There is concern about safety with regard to the station's placement. Staff is unable to view down the corridors when standing behind the desk. The alcove type of nurse's station present in the middle of a wing provides no view

down the hall for nurses who sit behind the desk. Residents tend to congregate around it as a center of activity, thereby blocking the corridor and making it difficult for others to pass by. There is a need for a nurse's station that enables a clear view down corridors.

Dining Room: While nurse's aides are helping residents with eating, another resident who is unsupervised wanders away with easy access to the outdoors. Currently, staff utilize shift eating due to a shortage of staff members. Having separate smaller dining areas away from the main entry would be more beneficial to the staff when feeding residents. The number of residents in each dining area ideally would be no more than 20 persons (Gwyther, 1985).

Activity Area: Because of the various agitation levels of participants, staff members believe that smaller groups of persons can be observed much easier when in smaller spaces. However, certain large group activities promote socializing and give residents a feeling of being included in projects. Generally speaking the staff believe that it would be easier to persuade residents to participate in smaller groups. It is easier to obtain and maintain the attention of residents when there are fewer distractions present (Gwyther, 1985; p. 68).

Corridor: The excessive length of corridors makes it difficult for staff to come to the aid of a resident immediately.

Bathroom: All residents need full assistance with bathing. The staff report that residents prefer neither a shower nor a bath. All resident's rooms are double occupancy with a toilet between them; four residents share one toilet. It is the opinion of staff members that very advanced AD residents do not recognize a toilet. Most residents require

assistance on/off the toilet.
The staff members believe that in a
bathroom there should be enough room for
two aides and a wheelchair. There is no
need for more bathrooms. However, there
is a need for a larger space.
Transferring residents on/off of the
toilet is difficult. Residents push
their wheelchairs into a toilet area,
then the staff is unable to reach them
in order to help them out of their
wheelchairs. Some residents grab hold
of handrails in order to resist aid.
There is a need for more strategic
placement of handrails. Staff
suggestions do not agree with all ANSI
standards for barrier free design. For
example the desire by staff to remove
the grab bars behind the toilet does not
meet standards set by ANSI.

Bedroom: The majority of residents do not
recognize their own area, for example,
which bed is theirs or which closet holds
their articles. The staff members
reported that residents exhibit no sense
of territory. The situation for
evaluating residents confined to their
beds is very difficult. There is a need
for more appropriate lighting in
residents' rooms, especially near the
bed, in order to make it easier for staff
to evaluate residents.

Paraphrased remarks mentioned frequently by staff members

Note: These statements were made by the staff members
during a group discussion with the author.

1. Staff members believe that Alzheimer
    residents do not need a lot of "things."

2. The residents generally do not understand
    what belongs to them or to others.

3. There is a need for a calming environment.

4. The use of an intercom system serves as a
    reminder of an institutional environment.

5. The issues of wandering and safety are
    primary ones.

6. Staff members are on the go with limited time
    for rest.

7. There is a need for improved bathroom
    facilities. More square footage is needed in
    order to properly help residents get on/off
    the toilets.

8. The present position of the nurse's station
    makes doing paperwork frustrating, due to the
    many distractions from residents.

9. The present position of the nurse's station
    also restricts visual access to corridors and
    lounge areas.

Orchard Manor

Orchard Manor Campus Nursing Center in Colorado
is a total living and healthcare campus similar to a CCRC.
The nursing care unit consists of 180 beds. Many levels of
care are provided within the center. Beyond normal care
for elderly residents, Orchard Manor also specializes in a
wellness program. This latter program serves the needs of
residents who require special care or therapy after their
release from a hospital. The wellness program is quite
popular in this time of rising hospital costs and limited
stays. Trends indicate a need for such services will
continue to grow.

Exterior treatment The exterior of the building

appears inexpensive, but effective in appealing to

prospective residents and their relatives. Readily

apparent from the exterior are several two-story glass

atrium spaces containing the sitting areas of several

deluxe residential rooms. The gabled roof and exterior

wall treatment are effective in dispelling an institutional

appearance and help the facility fit in with the

residential surroundings (Figure 8). However, the size of

the complex negates some of what the building style

attempts to do. The administrators of Orchard Manor are

concerned with the appearance of the complex and feel the

outside reflects the quality of care given on the inside.

Layout of Care Facility Orchard Manor Campus

consists of two major buildings, one that is ten years old

and one that is three years old. The older building is one

story in height while the newer building is two stories.

Interior layout The interior layout of the

facility is quite confusing, due to the different

orientations of the two major buildings. A lack of an

interior organizing system can be seen in the floor plan

(Figure 9). The problem is most acute a series of

loosely connected spaces functioning as administration

and ancillary spaces in the area that ties the older and

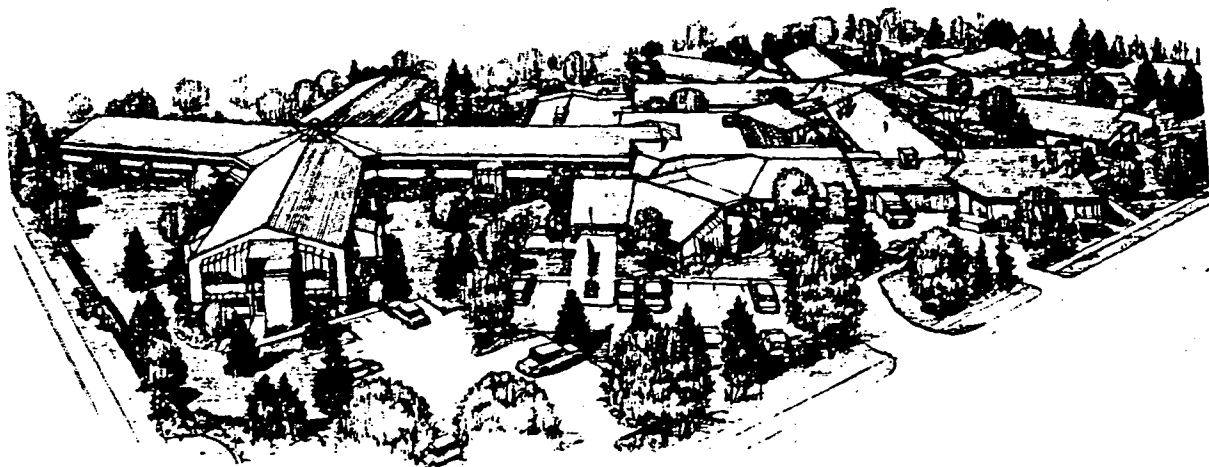the more recent buildings together. The older facility

Figure 8.   Exterior view of the main entry of Orchard Manor
(Pamphlet, Aurora, Colo.,1987)

utilizes a wheel-type arrangement with eight wings
generating from the hub, and the newer facility has a
similar layout with four wings radiating from a hub. The
use of signage and color keys, such as large brightly
colored numbers on the walls and repeated on the
floors of wing entrances, serve as limited help to a
complex interior environment where choices of direction
seem limitless, and a sense of hospital predominates
(Figure 10).

Layout of AD wing   One of the eight wings in
the older building was renovated to accommodate residents
having AD (Figures 11-13). The wing contains twelve
women and two men that occupy seven semi-private rooms.
The two end rooms, formerly a storage area and a private
room, were renovated into a dayroom and a dining room with
a kitchenette. Although some of the residents continue to
use the main dining room, a few of the women appeared to
enjoy the kitchenette.

The policy of the Orchard Manor administration and
staff concerning their AD residents generates from a desire
to allow residents to maintain a high level of safety in
the environment, while maintaining as autonomous a lifestyle
as possible. The administration reported that the
separation of the AD residents from the other residents was
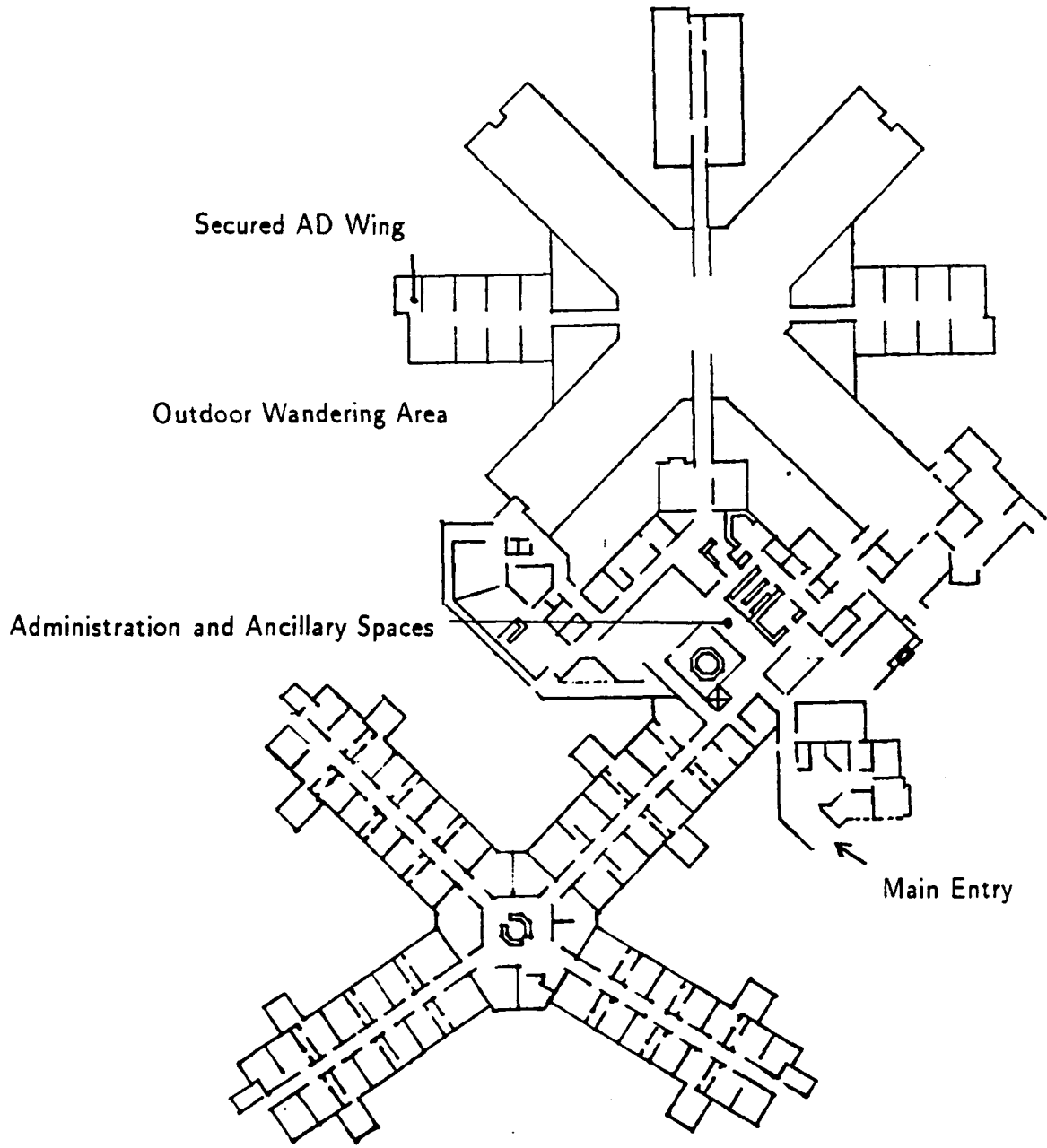necessary to protect the welfare for AD residents as well

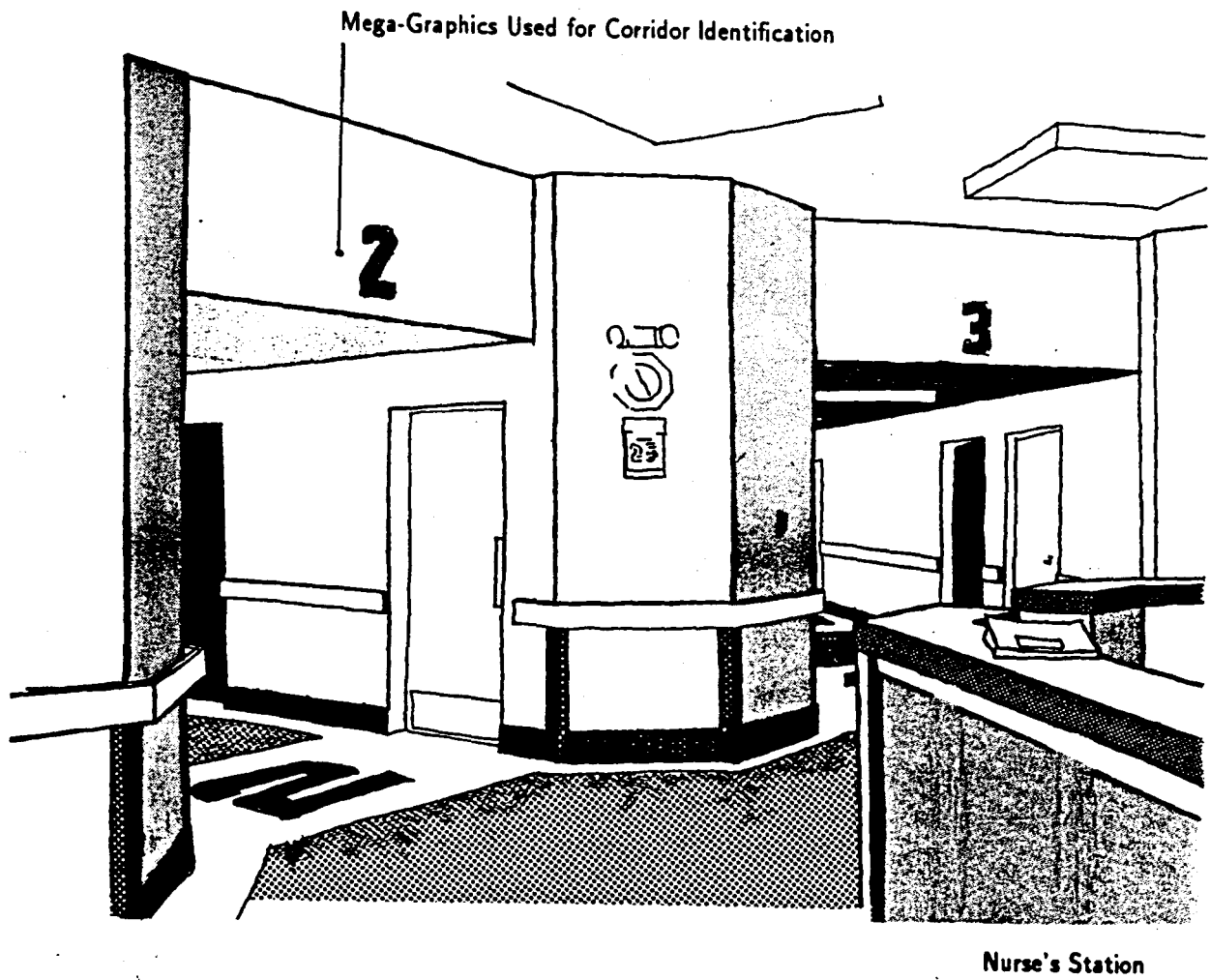Figure 9. Overall floor plan of Orchard Manor
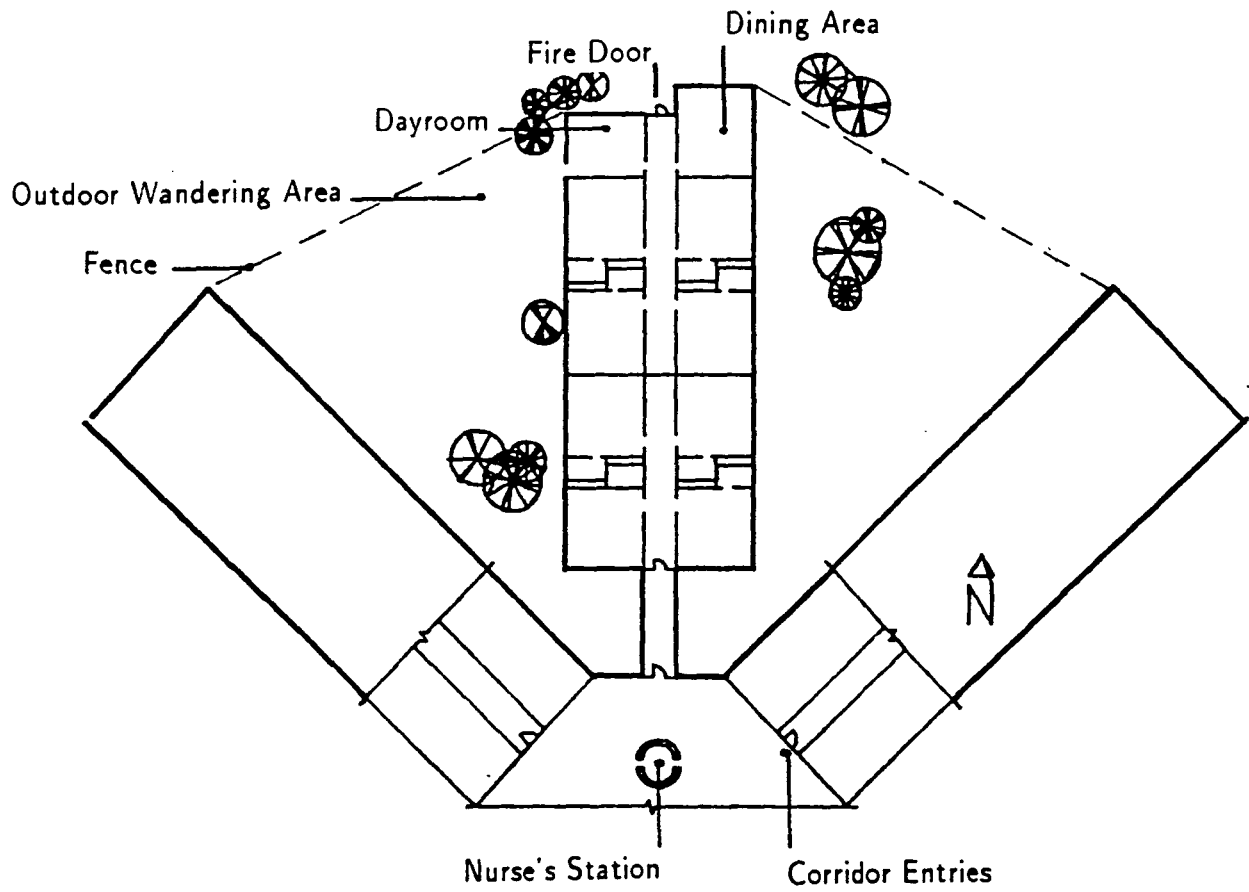
Figure 10. Typical use of corridor signage
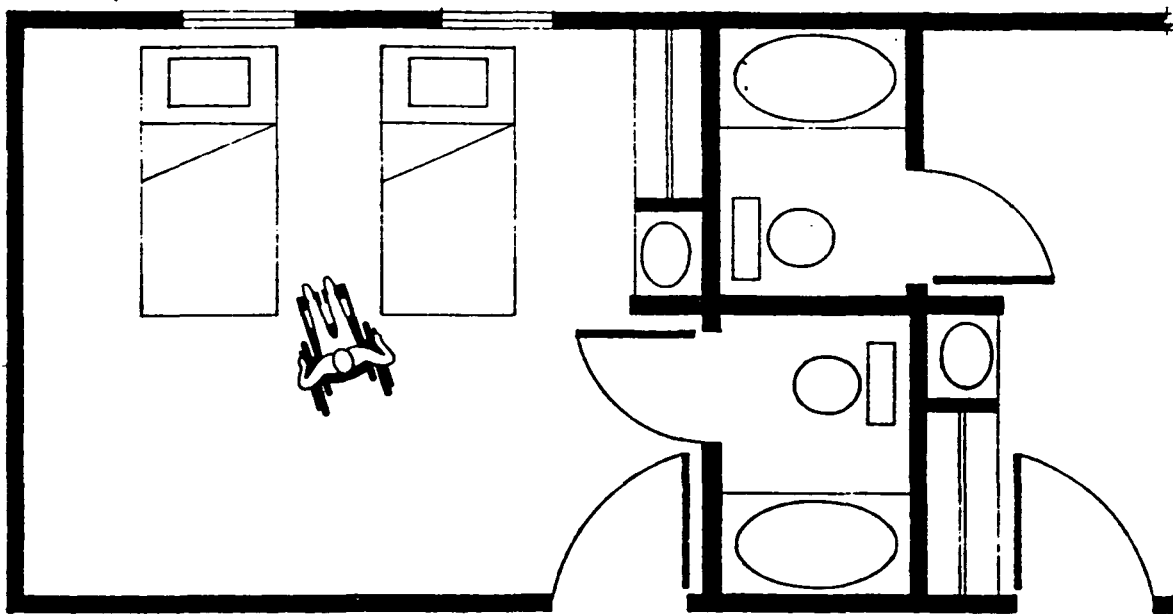
Figure 11. Floor plan of AD wing

Figure 12.   Typical floor plan of a resident's room at
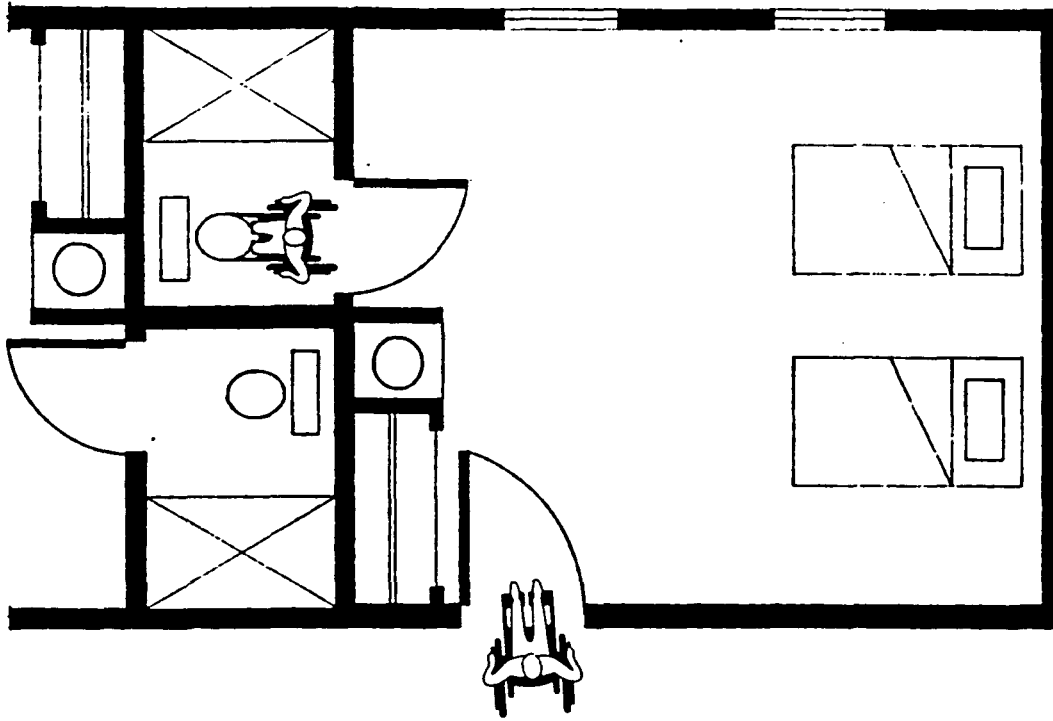Orchard Manor - variation 1

Figure 13. Typical floor plan of a resident's room at
Orchard Manor - variation 2

as other residents at Orchard Manor.

The secured AD wing was designed to provide comprehensive care for the wandering resident. A fenced in outside area with a large patio allows freedom of movement for outdoor activities (Figure 14). Residents are allowed to go outside under the supervision of a staff member.

There are two nurse's aides and a charge nurse (RN) present on the floor at all hours of the day. Another employee in the AD wing of the building is a part-time activity director who monitors activities such as music therapy and short duration games which are designed to strengthen short term memory. According to the staff, most residents who live in the AD wing of the building are well into the second phase or beginning third phase of AD.

Spatial arrangements of social areas   The administration reported that the lobby area was an important welcoming signal for visitors of current residents. However, few persons were actually observed using the space. In the opinion of the author, although it is a sunny pleasant space, its remoteness from the residential wings prevents most residents from using it.

Dayroom   Present on the AD wing is a dayroom where residents may watch television from a large sofa or

play games at a nearby table. The renovation of a storage area yielded a rather compact dayroom/activity space (Figure 15). Programmed activities and socializing take place here or in the dining room. The dayroom and dining room, situated opposite each other on the corridor, are the two main areas of activity on the wing. Due to the level of activity and stimulation which sometimes occurs in this area, most family members prefer to visit with residents in their semi-private rooms.

Nurse's station/corridor The staff does most of their paperwork and "charting" at the nurse's station which is located adjacent to the AD wing. The limited paperwork done on the wing is usually completed in the dining room where a nurse's station has been reduced to a work-shelf. One end of the wing's corridor terminates at the security entrance connecting the wing to the rest of the facility, while the opposite end terminates with a firedoor exit. The use of a typical double loaded corridor reinforces the institutional image of the building layout. However, the absence of a defined nurse's station in the wing helps to alleviate the institutional appearance.

Levels of care At Orchard Manor, nursing care and services are developed to fit the individual needs of each resident. Residents are admitted only under a physician's
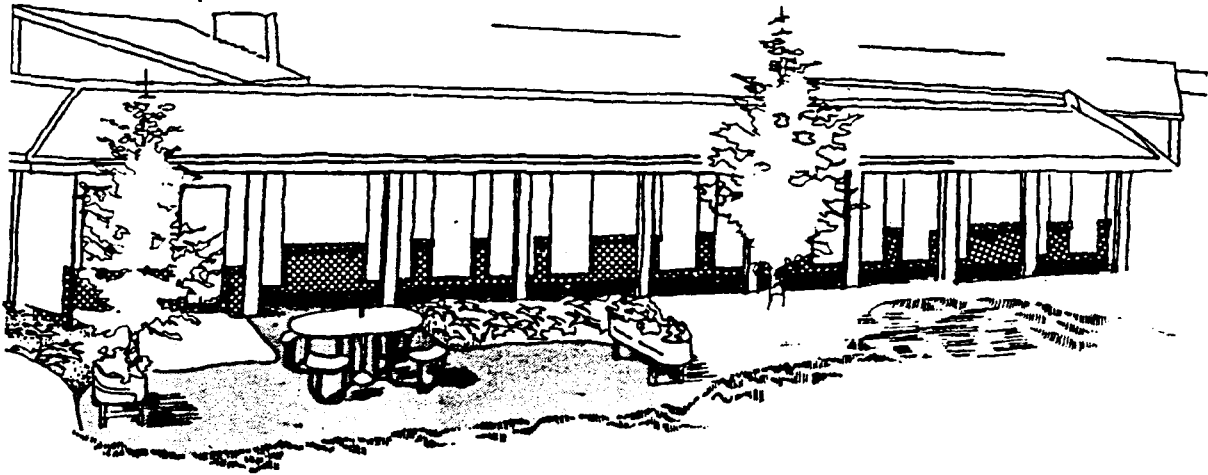
Figure 14. View of outdoor area for AD residents
of Orchard Manor

Exit to Outdoor Wandering Area

Furnishings are Institutional in Character
–Vinyl Materials

Dayroom Contains Same Wainscoating as Corridor

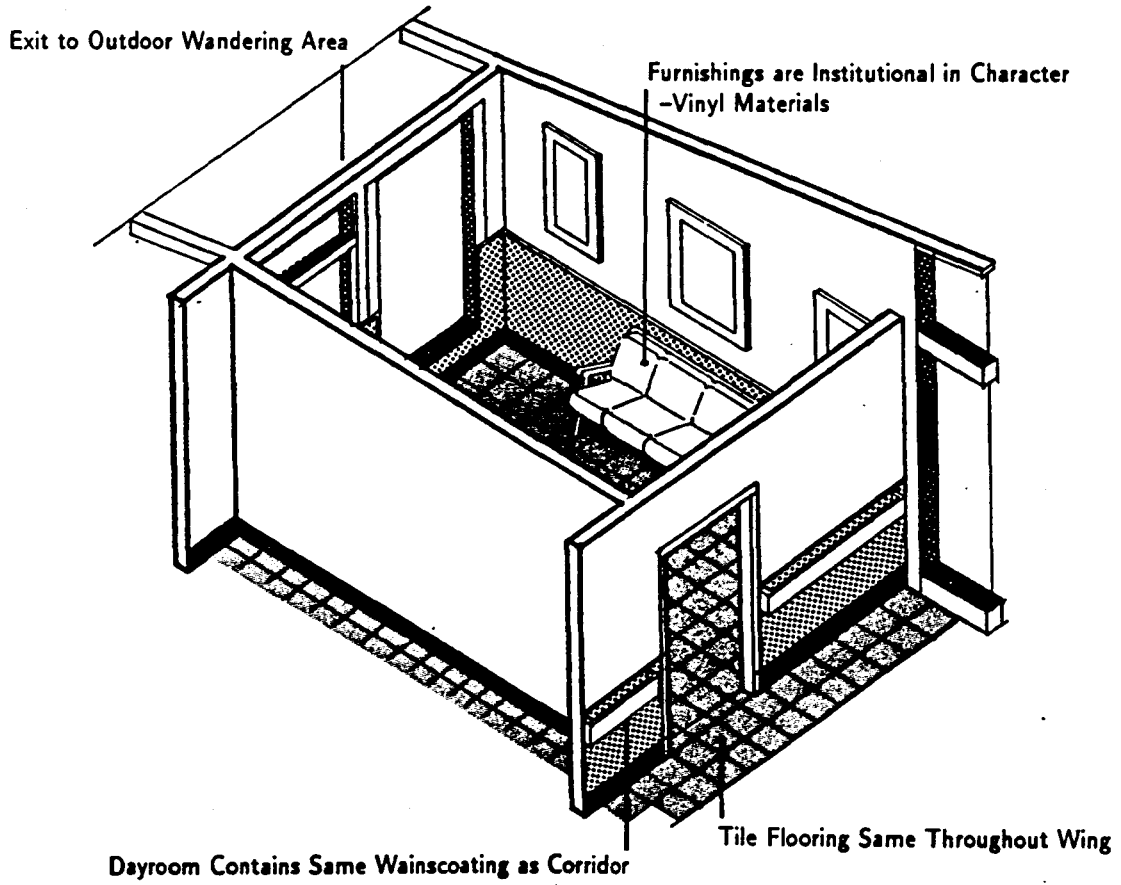Tile Flooring Same Throughout Wing

Figure 15.   View of dayroom on Alzheimer's wing at Orchard
Manor

care. Orchard Manor divides its levels of care as follows:

Minimal care   Each resident in minimal care determines his/her daily living activities and essentially cares for him/herself. He/She may require supervision and need assistance with medication or treatments.

Moderate care   Each resident in moderate care requires professional supervision and monitoring on a twenty-four hour basis, even though the resident may be ambulatory and able to care for him/herself.

Maximum care   Any or all of the following levels of need qualify for maximum care;

1. Assistance with activities of daily living such as feeding, bathing, dressing, toileting, and ambulation.

2. Severe confusion which requires the assistance in #1 as well as more time spent with supervision and direction of the resident.

3. Complete bed care such as lifting and placing the resident in/out of the bed is provided. room are optional. Observation of residents for physical or mental reasons may be required by staff.

4. Residents that require skilled professional personnel for treatments such as intravenous

therapy, oxygen therapy, nasogastric feeding,
catheter care, and dressings are also
included in maximum care.

Exceptional care   The resident's medical or
behavioral disorder requires exceptional time or medical
services to maintain optimal quality living. According
to the administrators of Orchard Manor, residents with
AD belong to this category.

Residential care   A special residential care
center on the second floor of the newer building serves
residents who need minimal supervision with small details
of daily living. Orchard Manor offers this alternative
program for those residents who are well enough to manage
the daily living activities of dressing, bathing,
housekeeping, and going to meals. No one who is wheelchair
bound is allowed into the residential program. A licensed
nurse is on duty eight hours daily. However, nursing care
is available 24 hours a day with a call light system.
Medication is monitored from a central area and homemaker
services are available as needed.

Other forms of care at Orchard Manor are:

1. Adult care-based on a day care system in
    which the entire elderly population may
    benefit from the center's physician services,
    therapies, meals, recreational and social
    services, and personal care.

2.   Respite care-a program similar to the
     wellness program. Designed to accommodate
     the short-term needs of a person. This
     program is aimed at the elderly who need
     temporary aid which is not available at home.

3.   Care of the terminally ill-a unit planned
     and developed to meet the needs of a dying
     resident and his/her family members.

Care Routine: staff attitudes and suggestions

     Note: the following discussions apply to staff
member's attitudes concerning residents in phase two of
Alzhiemer's disease.

General Response: Staff stated that a need exists for
                  an AD wing and segregation of the wing
                  from the rest of the facility is
                  necessary.

Behavioral Issues:

Withdrawal/
Apathy: Staff reported occasional difficulty in
                       obtaining cooperation from residents
                       during therapy. A reported lack of
                       interest in daily activities and
                       surroundings is apparent in some
                       residents. Apathy is typical of persons
                       in the second and third phase of AD.

The Physical
Environment

Activity Areas: The activity/dayroom seems conjested and
                       residents become distracted when more
                       than eight persons are participating in
                       group activities.

Corridor: The wandering path seems to be
                   primarily the corridor of the secured
                   wing. Although an outdoor area is
                   designated for wandering, the access door
                   is kept locked by the staff in order to
                   guarantee safety of the residents.

Bedroom: Entry to the bathroom of a private room
                   is difficult due to the position of

                   the entry door of the room. Little
                   personalization was observed in
                   resident's rooms, due in part, to a lack
                   of space provided for personal
                   furnishings in each room.

Paraphrased remarks mentioned frequently by staff members

Note: Each statement represents at least two staff

member's similar responses obtained by the author during

informal interviews.

1.   Administration and staff members stated that
     an AD wing worked more efficiently when
     limited to no more than fourteen residents.

2.   Staff members stated that the large colorful
     numbers on the floors and repeated on the
     walls, do offer limited help to orient
     visitors.

3.   A nice lobby space is important for
     prospective visitors and current residents.

Hickory Park Nursing Care Facility

Located in Colorado, Hickory Park is a facility that

offers residential, intermediate, and skilled care.

Operating as a "pay as you go" facility, prices range

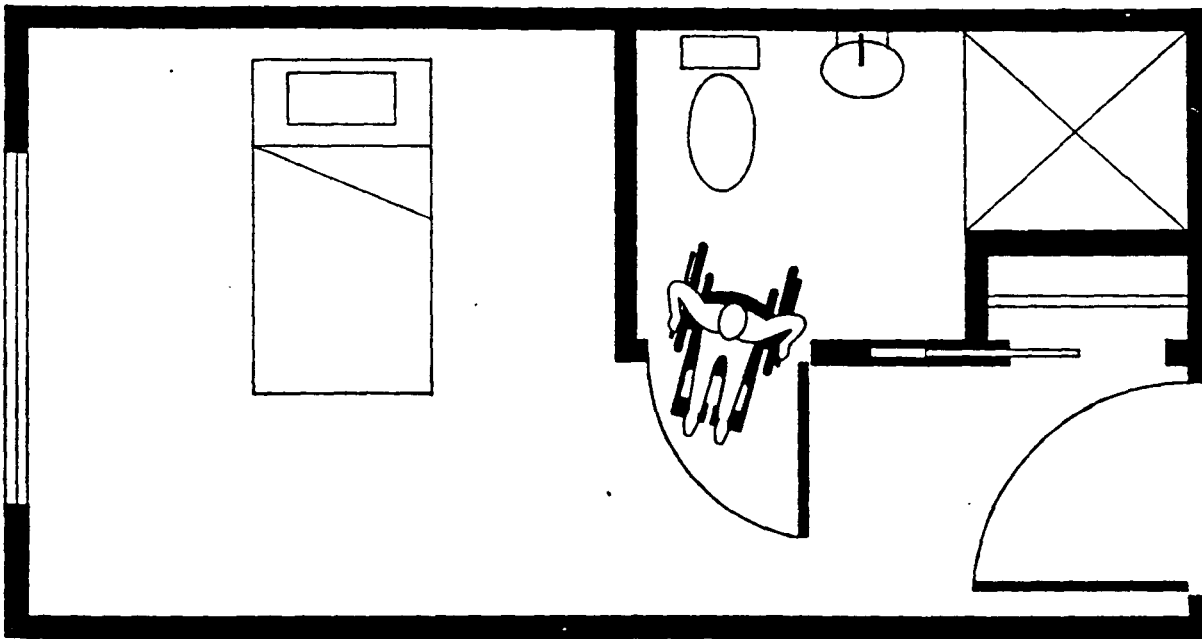from $65.00 per day for a semi-private room to $105.00 per

Figure 16.   Typical floor plan of resident's private room
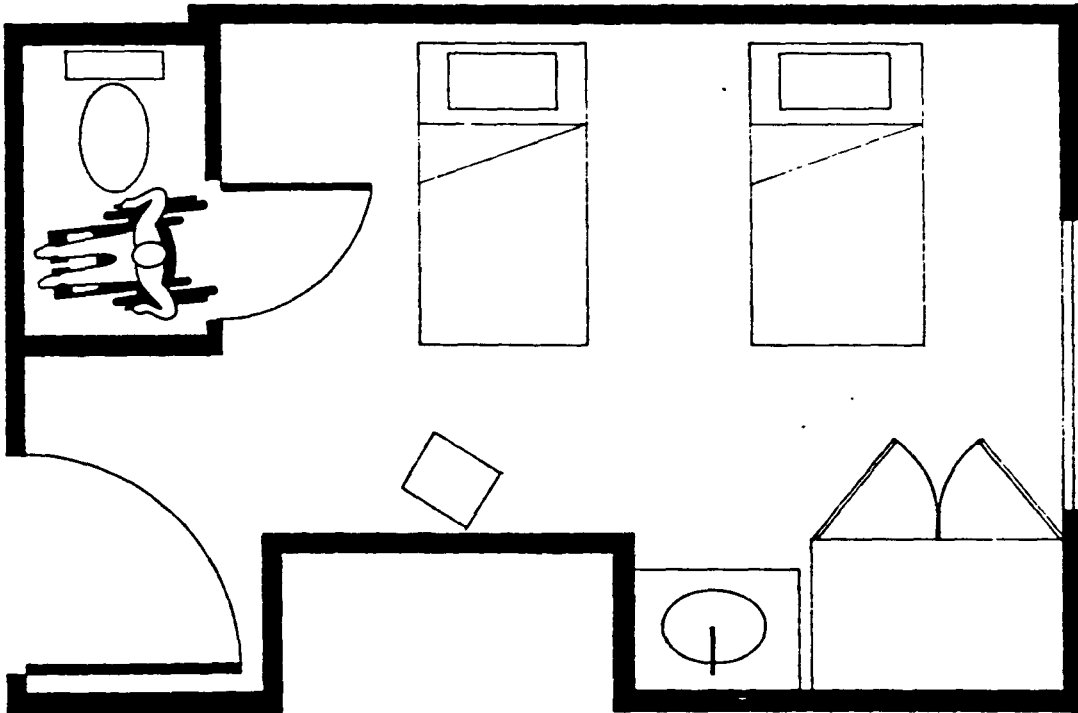at Hickory Park Nursing Care Facility

Figure 17. Typical floor plan of resident's semi-private
room at Hickory Park Nursing Care Facility

Figure 18. Exterior view of the main entry to Hickory Park
            Nursing Care Facility (Pamphlet, Denver, Colo.
            1987)

day for a private deluxe suite. Of the 140 beds available,
120 are in nursing care with the remaining 20 in
residential care. Both intermediate care units and skilled
care units are located throughout the facility, allowing
for various levels of care on the same wing (Figures 16-
17). The building is divided in half with each nursing
care wing of 60 beds staffed by an RN, an LPN,
and five certified nursing assistants.

Exterior treatment   Hickory Park was designed to
fit the facility into the surrounding suburban environment.
With the use of a colonial style architecture and gabled
roof, Hickory Park clearly mimics the surrounding structures
(Figure 18). An institutional setting is defined by the
presence of a parking lot stretching across the main
entrance of the complex. However, due to the close
proximity of the parking lot, walking distances are greatly
minimized. Negating the institutional character is a large
brightly colored canopy protecting a turn about area at the
front entry.

Layout of care facility   The layout of the building
is confusing (Figure 19). For example, the double loaded
corridors are staggered in order to alleviate long vistas
down the hallways (Figure 20). Unfortunately, the material
treatment is very similar on every corridor (Figure 21).
This similarity coupled with short vistas leads to a
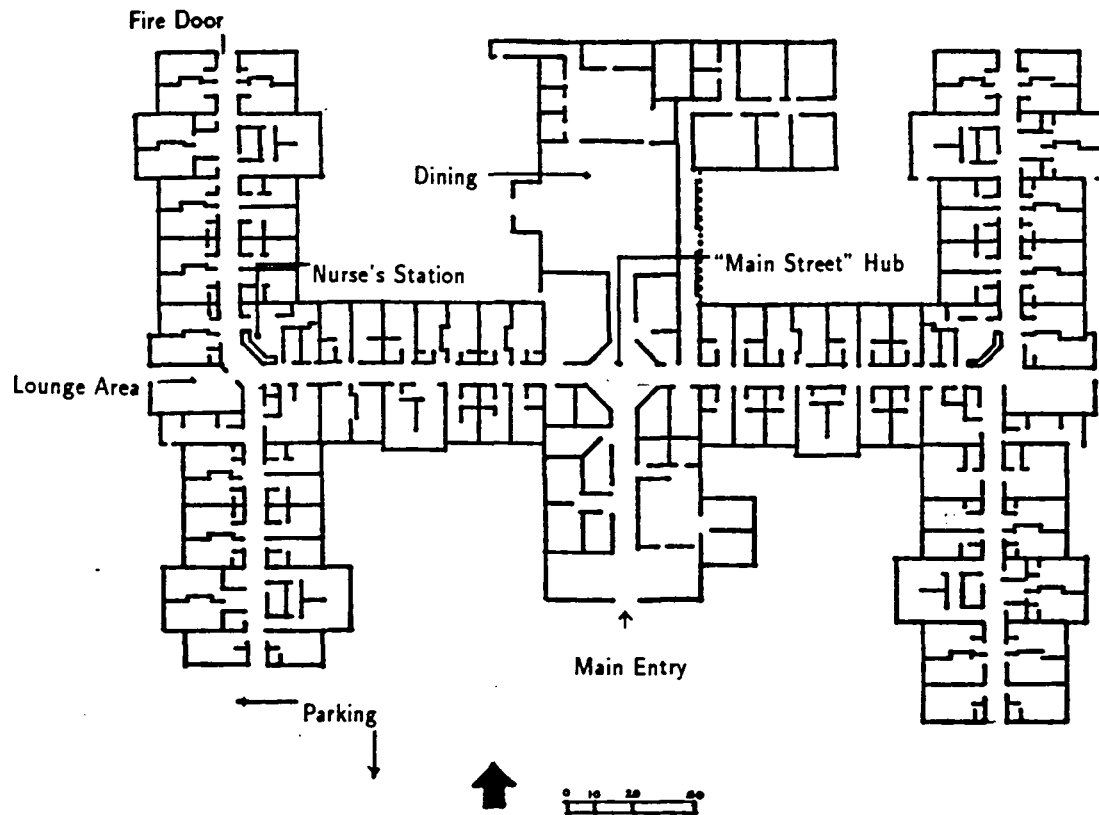
Figure 19. Overall floor plan of Hickory Park Nursing Care Facility

Staggered Corridor Reduce Long Vistas
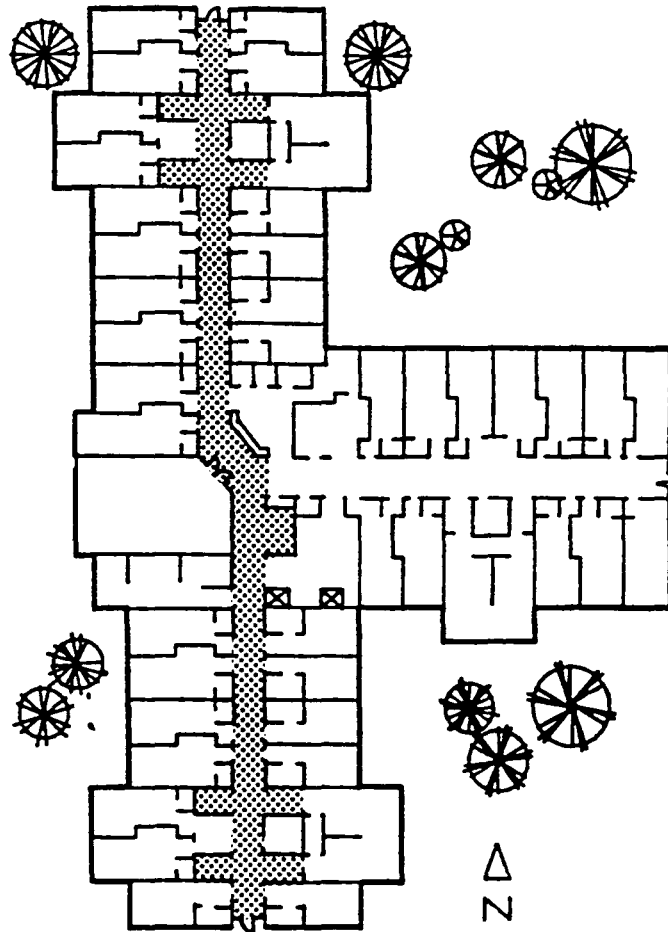
Figure 20.   Typical wing of Hickory Park Nursing Care
             Facility showing staggered corridor
             treatment

Residents' Doorways Are Not Personalized
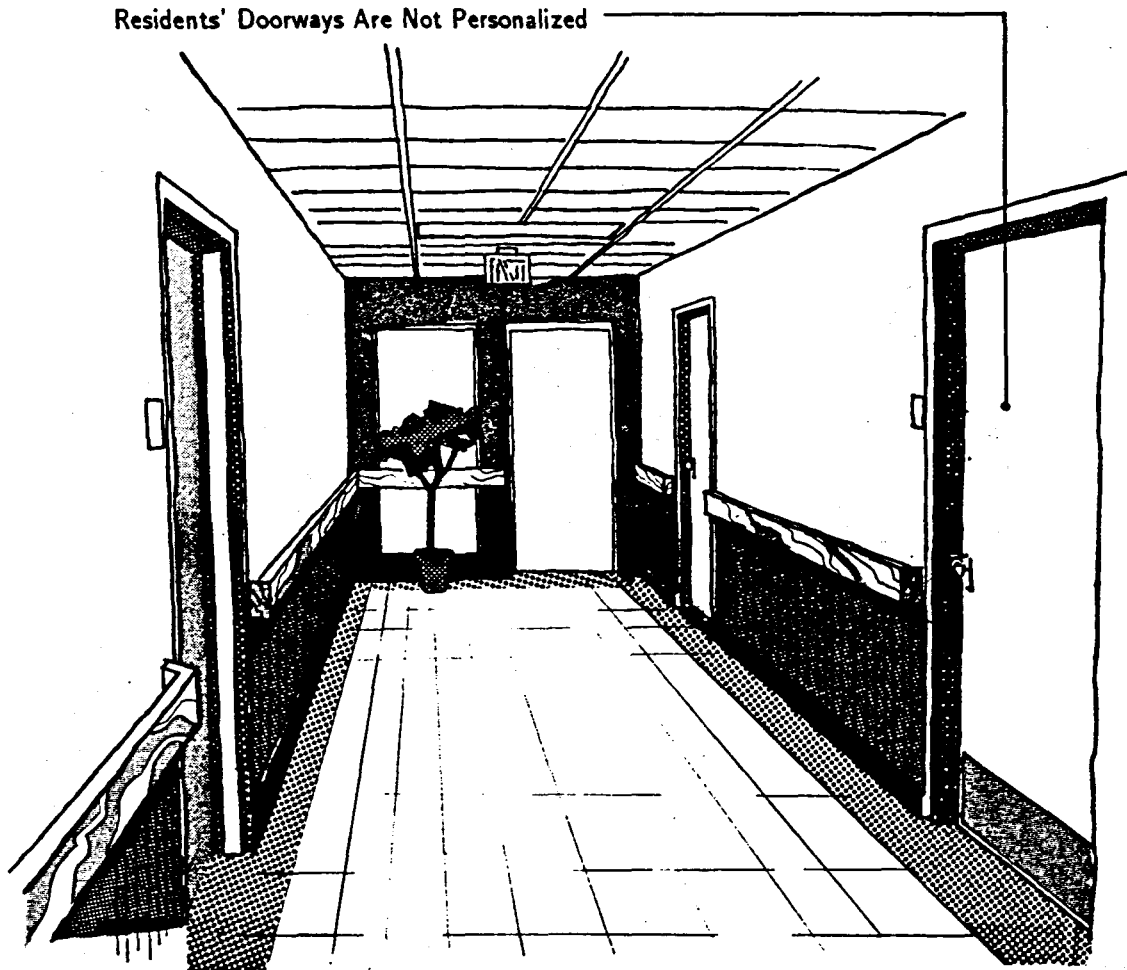
Foliage Present in Every Corridor   No Visual Distinction in Corridor Treatment

Figure 21.   Typical view of a corridor at Hickory Park
             Nursing Care Facility

Figure 22. View of the "Main Street Hub" at Hickory Park
Nursing Care Facility

mirroring of the environment. One has the sense of walking around in circles. Fortunately, small alcoves are present in each corridor to provide places to rest.

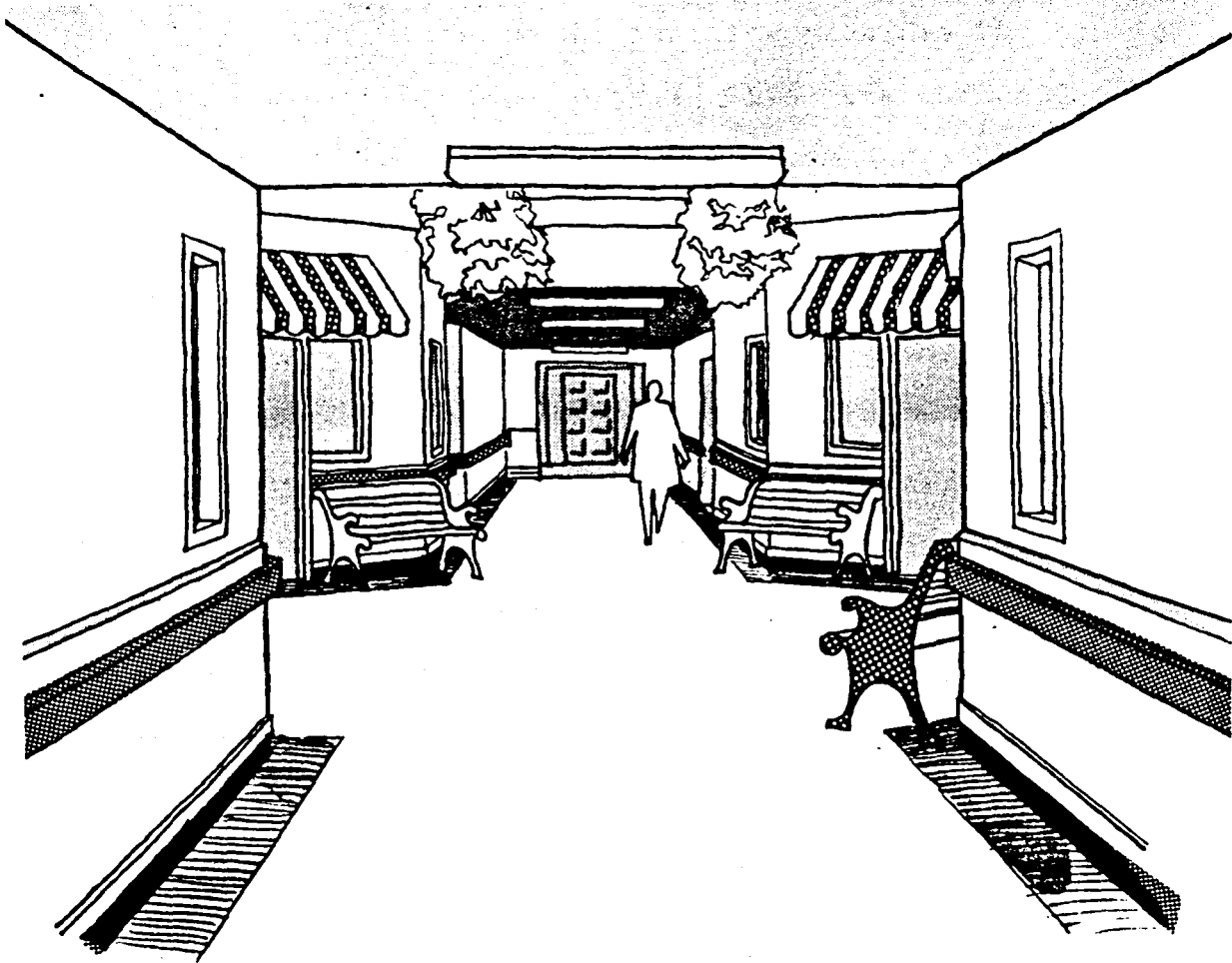The central core of the facility provides the hub for various activities. Amenities in this area included a gift shop, a candy store, an activity room, and a library, all lending to a "main street" atmosphere, complete with park benches for residents and visitors to enjoy (Figure 22).

Levels of care   Developed through programs designed to minister to the physical needs and enhance mental, spiritual and social qualities of life, this facility is a total living and healthcare campus. Although the terminology may vary, essentially the levels of care provided are similar to those described in the literature review pertaining to a nursing home.

Skilled care   Skilled care is the highest level of care available. Skilled nursing care provides for all of the needs of the residents who require total care. Residents at this level may be recovering from a hospital stay, need complete personal care, may require extensive therapy, or may need oxygen. Special supervision may be needed for medications, diagnoses, or behaviors.

Intermediate care   Those who need some nursing care yet do not require the intensive care offered at the skilled level are cared for on the intermediate level.

Assistance may be needed with dressing, bathing, walking, or eating. Supervision of medication or diets may also be necessary.

Residential care   This is for residents who are self-sufficient but may need minimal supervision with small details of daily living. Planned activities, meals, snacks, housekeeping, and laundry services are all provided in residential care. The cost of residential care is substantially less than skilled and intermediate rates.

Policies toward AD residents   At Hickory Park care facility, the residents who have AD are integrated with other residents in ICU and SCU rather than being segregated in a separate wing of the building. Amazingly, the administration only reported four residents diagnosed as having AD. This represents a little under 3% of the population at Hickory Park. The national average of institutionalized elderly having AD is over 11% (OTA, 1987; Gwyther, 1985). This would lead one to believe that either the Hickory Park figures are incorrect or the resident population is quite atypical for a nursing home. Due to the rather low percentage of AD residents, the administration had no specific policy concerning the care of AD residents. However, the administrators did feel that the AD residents received very good care in part due to the concept of integration. This is a practice not widely used

in nursing care, due to the increased realization of the special needs of this group (Calkins, 1988; Gwyther, 1985; Reever and Koerner, 1987).

Ancillary services   Dental, laboratory and X-ray services are available through local agencies, as well as portable mobile units for on-site testing and evaluations.

Recreational and social activities   Residents are encouraged to participate in activities planned by the Activity Director. The schedules consist of exercise, musical programs, arts and crafts and religious services. A corp of volunteers provides the residents with a continued link to the community.

Therapies   Physical therapy, speech therapy and occupational therapy are made available to residents who need them. These programs are developed as prescribed by the resident's physician for rehabilitation, restorative care, and maximum functioning.

Spatial arrangements of social areas   The main area specifically designed as a lounge is located near the entrance. This area is quite residential in appearance with the inclusion of carpeting, sofas, wing-back chairs, end tables with lamps, and appropriate window treatments (Figure 23). The color scheme is very sedate using a light cream and blue motif. The administration felt this area displayed to visitors the quality of living achieved at
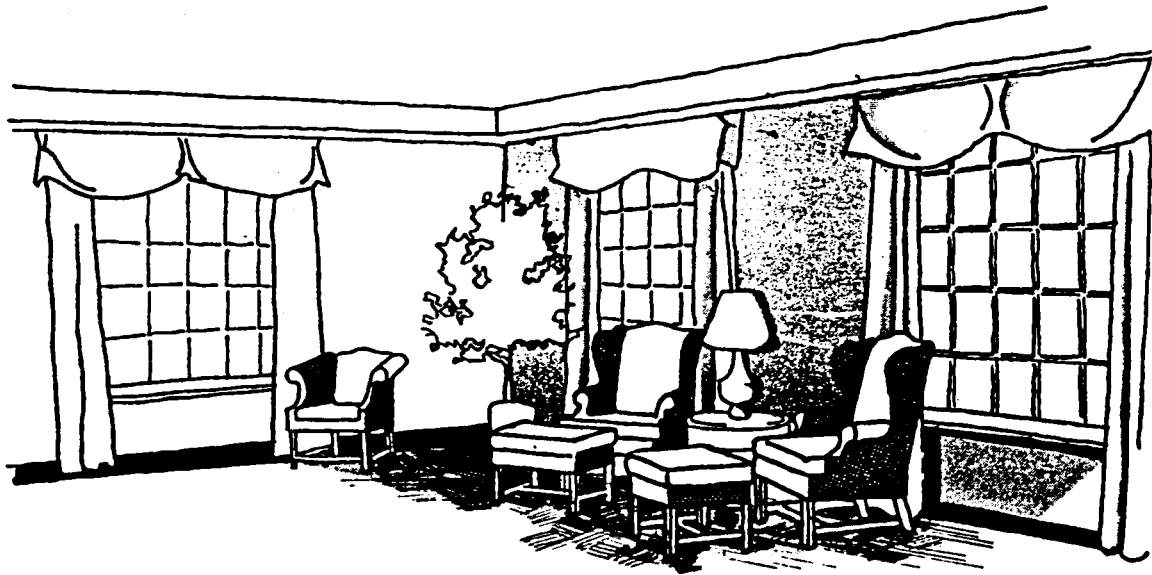
Figure 23. View of the main lounge area at Hickory Park
Nursing Care Facility

Hickory Park. The author felt the design of the lounge combined considerations for both the visiting family member and the resident. Through the use of large, sturdy, high-backed furnishings, elderly residents can more easily support themselves when reclining or getting up. Soft colors, popular in residential settings, contribute to a comfortable surrounding. But, lighter colors cannot be easily discerned by many elderly people (Roll, 1986). The author believes that the color scheme used in Hickory Park is more to the benefit of visiting family members. While some distance from resident's rooms, the lounge appeared to be quite popular.

Main street hub Located in the center of the facility where the four ten-foot wide corridors converge is an area defined by a raised ceiling and skylights. Shops and various ancillary services are located here. The incorporation of large hanging plants provides cues for orientation with landmarks that guide residents to this main axis of the facility (Figure 22). In addition to park benches and brightly colored awnings over each shop, the different facade treatment given to the gift shop, candy store, and library reinforce a "main street" atmosphere. Here, residents have the opportunity to actively participate or unobtrusively sit and watch.
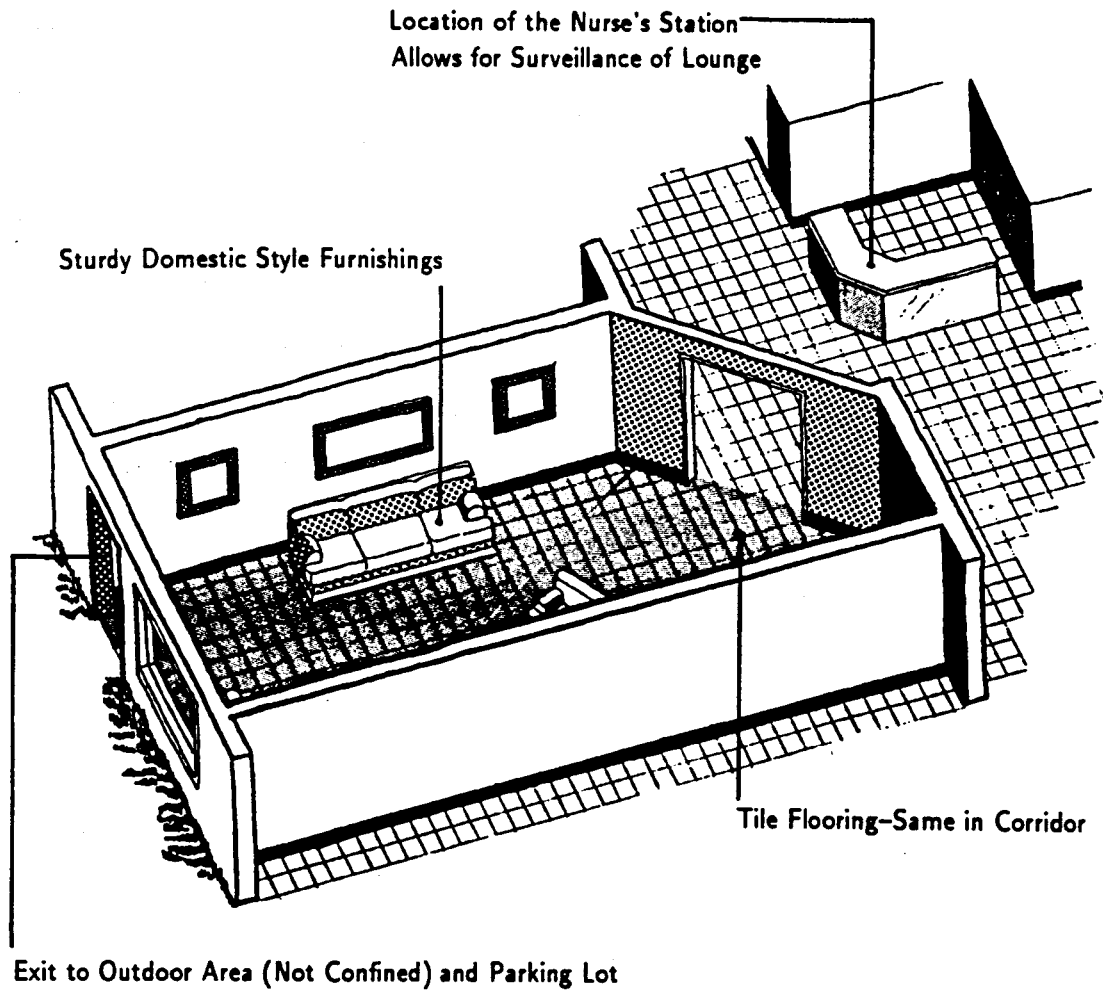
Figure 24. View of the residents' lounge adjacent to a nurse's station at Hickory Park Care Facility

Nurse's stations and corridors   Nurse's

stations are located at the intersection of every three

corridors. There are large resident lounges located within

a close distance to the nurse's station (Figure 24).

Therefore, the corridor that runs along side of each wing

station becomes a place for residents to gather. Although

the corridors are eight feet wide, the area surrounding a

nurse's station can become congested during certain times

of the day. All of the corridors are given similar surface

treatment, using the same color scheme and tile flooring.

There is very little differentiation or personalization in

the corridors except for an occasional picture. There is

no personalization on the doors of resident's rooms (Figure

21).

Care Routine: staff attitudes and suggestions

Note: The following discussion is a compilation of

remarks staff members reported concerning all nursing care

residents of Hickory Park Nursing Center based upon informal

interviews with groups and individuals.

General Response: Administration and staff reported that
the integration of AD residents with
others is beneficial to all concerned.
A family care approach is utilized by, the
administration and staff members, where
persons take on a more active role in
the welfare of each other contributing
to a stronger sense of community.

Behavioral Issues:

Rummaging,
Pillaging
and Hoarding: Staff reported that a few residents
                             who seem to search for "missing"
                             articles in other resident's belongings
                             are the cause of frustration among
                             other residents. Safety is also of
                             primary concern for residents who no
                             longer recognize certain functions of
                             objects or articles.

Wayfinding/
Orientation: Staff stated that the redundancy of

                             material application in corridors and the
                             lack of recognizable corridor landmarks
                             contribute to the disorientation of some
                             residents. In some cases, disorientation
                             leads residents to become either
                             defensive, aggresive, passive, or
                             confused.

The Physical
Environment

Activity Areas: The main activity area known as
                             the "main street" appears to be at a
                             distance that discourage residents who
                             are more feeble not to travel. The
                             author noted residents in wheelchairs
                             using the nurse's station as an area of
                             focus while able-bodied residents
                             were observed using the "main street"
                             hub as a focus of activity.

                             A large 24'x25' sunny, physical therapy
                             room reportedly receives use, while an
                             adjoining open courtyard is used very
                             little. The staff gave no reason why
                             the outdoor area was not used.

                             An activity room of approximately 875
                             square feet, connected to the "main
                             street" hub, is used often. The staff
                             liked the fact that they can divide the
                             space with partition walls and still have
                             sufficient space for exercise groups.

Nurse's Station/
Corridors: Staff reported that the staggered
double-loaded corridors eliminated long
narrow views, but the repetition of
corridor treatment may contribute to a
general lack of "adventuresomeness" among
some residents.

Paraphrased remarks mentioned frequently by staff members

Note: Each statement represents at least two staff

member's similar responses obtained during informal

interviews.

1. The entrance lounge effectively demonstrates
to visitors the quality of living residents
enjoy in their facility.

2. The "main street" hub is a popular amenity.

3. The primary goal of the staff is to maintain
safety and enhance a sense of community among
residents in the care units.

4. The staff work days are very full and
active.

5. The repetition in corridor treatment adds to
some frustration by residents and new staff
members.

Summerville Manor

Summerville Manor, located in Illinois, is very

similar in programming and organizational structure to

Orchard Manor in Colorado. Both facilities are considered

to be CCRCs. Summerville Manor contains 100 beds; 40 are

devoted to residents with AD. Summerville Manor has two

wings which are specifically developed for the care of AD

residents. The current wing houses 20 residents, all are

in the beginning or the middle of phase two of the disease. In order to house the AD residents in the final phases of the disease, the second wing was constructed recently and also houses 20 residents.

Summerville Manor accommodates a variety of programs for the local elderly population. For example, there is a daycare program and a wellness program. Both are similar to the programs at Orchard Manor. Other levels of care include skilled, intermediate, and residential. A resident cost for living at Summerville Manor is considered private and ranges from $70-$82 per day.

Exterior treatment   The designers of Summerville Manor take advantage of its rural surroundings by spreading out the large scale building complex. The architectural treatment of the building is a colonial style with a large Palladian window gracing the main entry. A brightly colored canopy protects the main entrance during inclement weather.

Parking is provided around each side of the facility. A glass enclosed breezeway attaches the three story residential apartment complex to the nursing care facility. The nicely landscaped area between these two buildings contains a putting green.

Layout of care facility   Summerville Manor is organized by a series of rectangles. Four 8-foot wide

double-loaded corridors meet to form a nurse's station with a connecting lounge. Outdoor courtyards are formed by the intersections of the complex's rectangular configuration.

The nursing care facility is layed out symmetrically. The repetition of corridor treatment can be disorienting due, in part, to the following:

1. The same non-gloss, scuff resistant tile flooring is used throughout the facility.

2. The same wall treatment (color scheme, material usage, and wall hangings) is used throughout the facility.

3. Repetitive signage (small plaques of copper plating using an indented type of less than 60 points (5/8") in height) is used for all room identification.

4. From residential wings, the view down corridors terminates with a nurse's station/lounge area. All of the nurse's station/lounge areas have similar furnishings and material treatment (Figure 25).

Layout of Alzhiemer's wing   The older AD wing consists of a dining room with kitchenette for family style dining, a domestic appearing lounge containing a fish tank, 8 semi-private rooms and 2 private rooms (Figures 26-29).
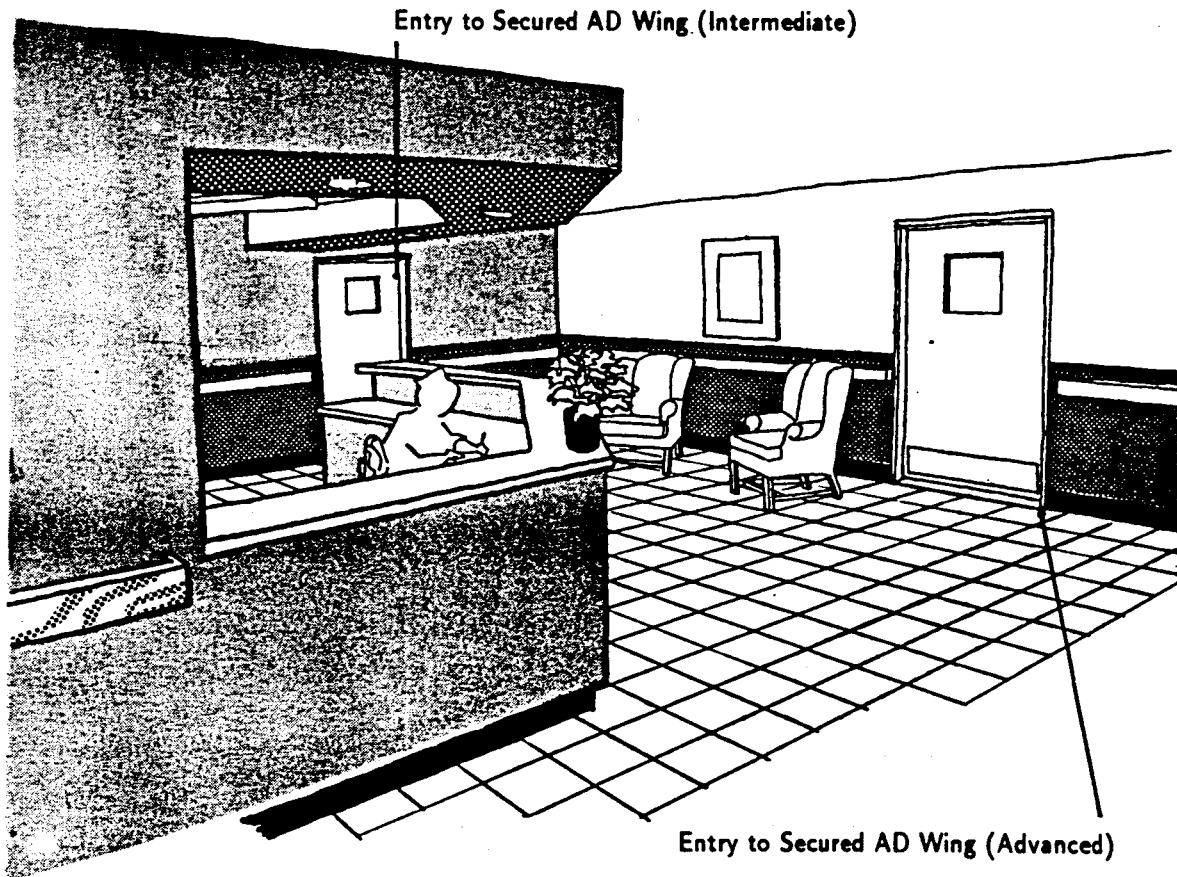
Entry to Secured AD Wing (Intermediate)

Entry to Secured AD Wing (Advanced)

Figure 25. Typical view of a nurse's station-lounge area
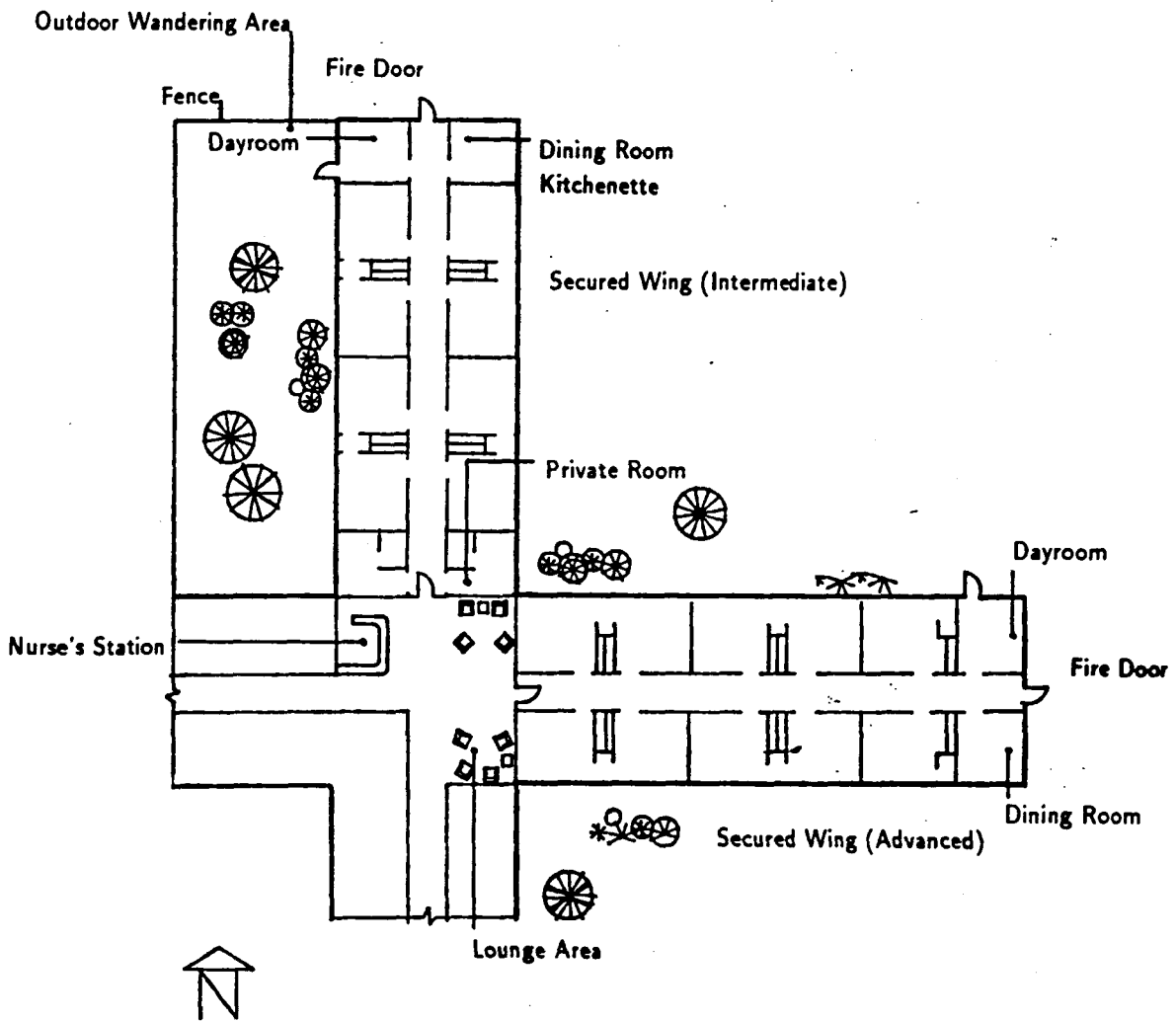in Summerville Manor

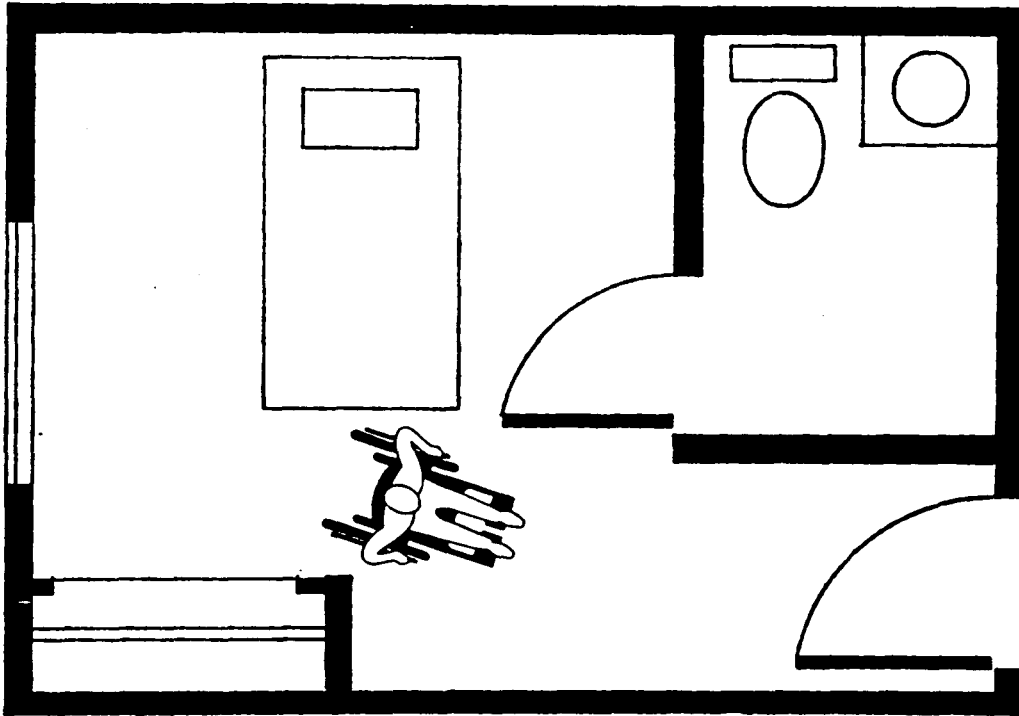**Figure 26.** **Floor plan of both AD wings at Summerville Manor**

Figure 27.   Typical floor plan of resident's private room
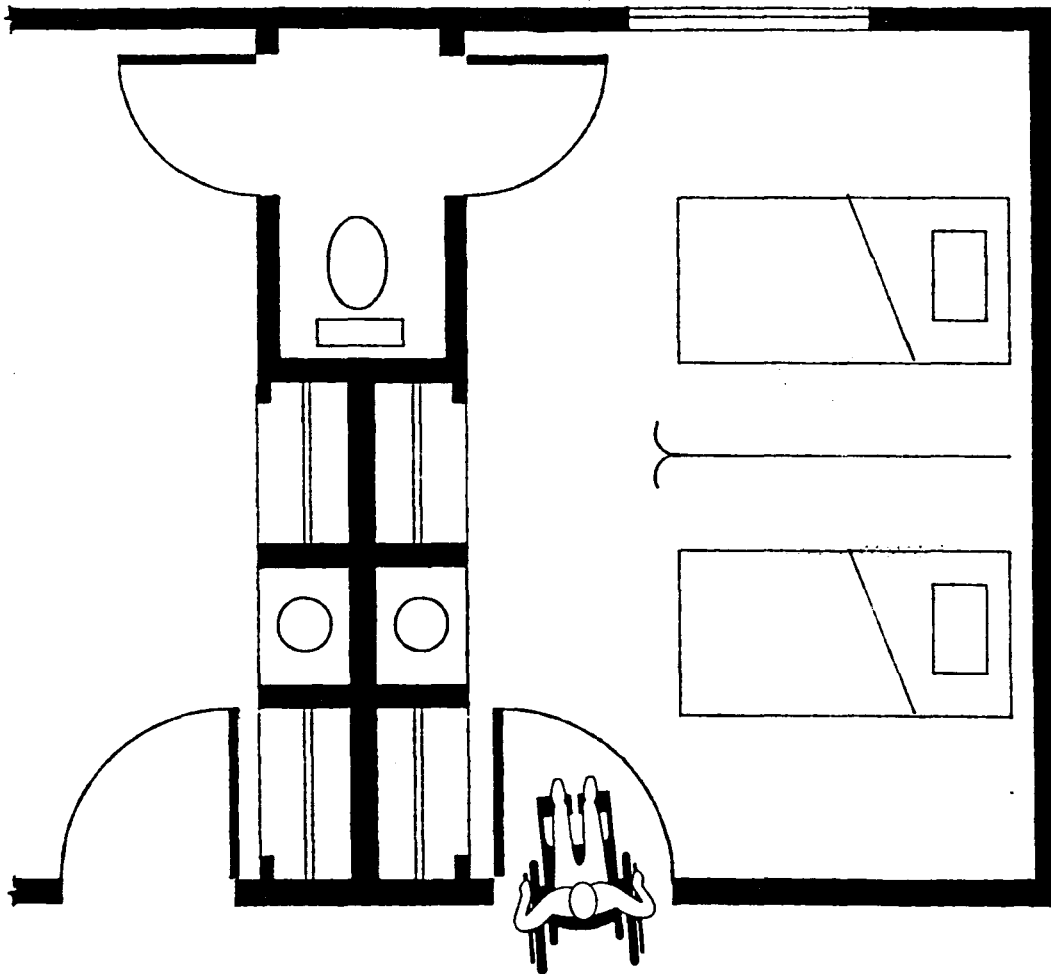in AD wing of Summerville Manor

Figure 28.   Typical floor plan of resident's semi-private

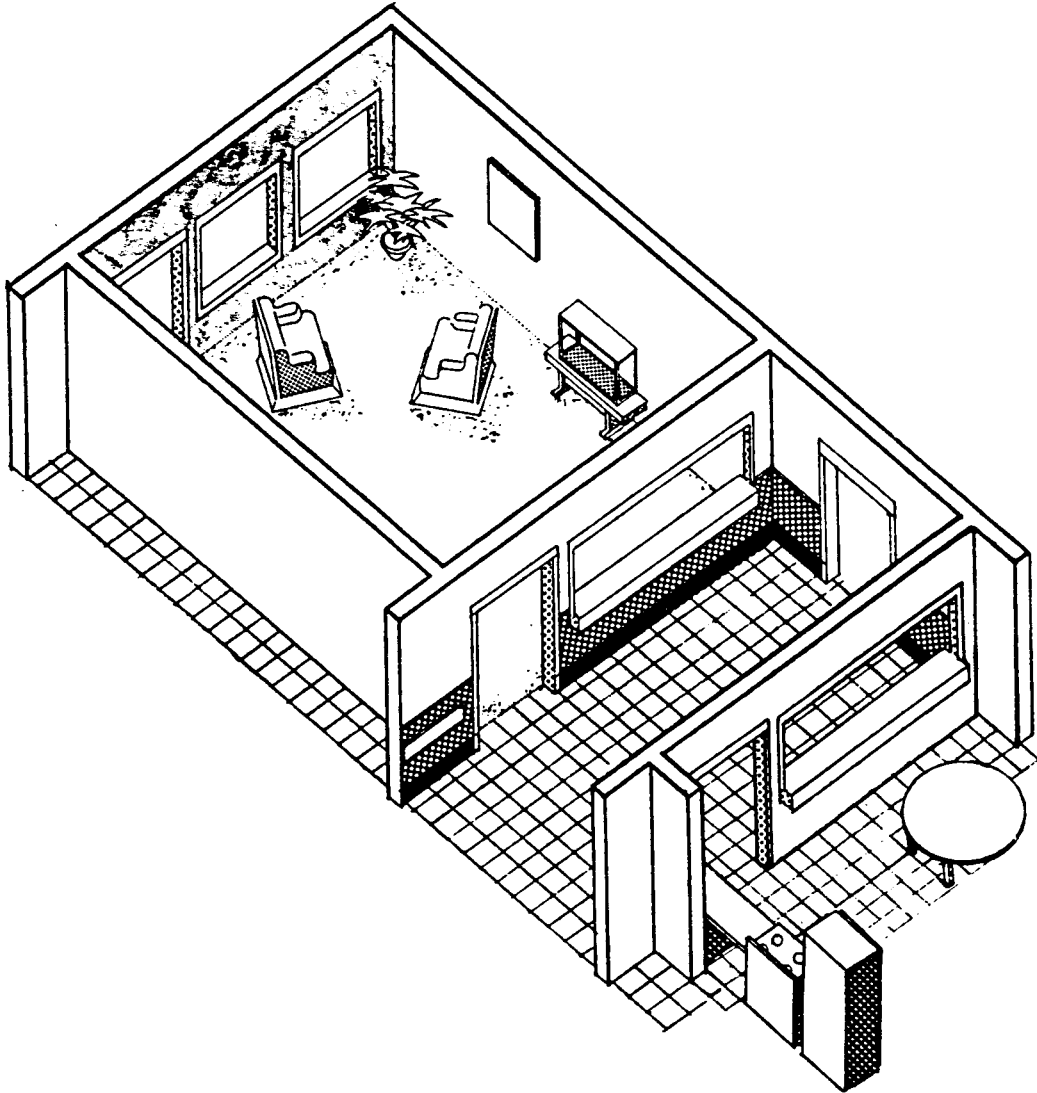room in AD wing of Summerville Manor

Figure 29. View of the dayroom in the AD wing of
Summerville Manor

From the lounge, residents have access to an outdoor courtyard flanked on three sides by the building itself and on the fourth side by a white picket fence. The wing's double-loaded corridor is 8 feet wide with a non-gloss tile flooring. Wall treatment consists of a cream colored wainscoating material that resists scuffing by wheelchairs. Above the wainscoating, the wall treatment consists of a dark blue fabric where pictures can be hung.

Upon registering into the facility, new residents are given the opportunity to choose from limited samples of:

1. The type/color of the drapery used in their rooms.

2. The option between carpet or tile flooring.

3. The color of the walls (pertinent only if a room needs to be refinished).

4. Residents are allowed to bring furnishings from their home, as space will allow.

These choices, although limited, allow residents to maintain a level of autonomy over their new surroundings, ease the adjustment period, and develop a sense of ownership and control.

The two AD wings are considered "self contained" units. The designer made entering and exiting the two AD wings a multi-stage process. The use of a combination buzzer lock requires the user to remember a sequence of numbers. According to the director of nursing, this

technique works quite well. In certain areas, safety precautions are taken such as the use of a lock device and timer on the range top in the kitchenette. Residents have control over and access to all areas of the unit.

The older AD wing houses residents who are in the middle of phase II. Although the second wing houses residents in the later phases of AD, there is no difference between the design of the two wings. Currently, there is one RN per AD wing with two LPNs and four nurse's assistants available. The nurse's assistants remain "on the floor" at all times. Charting and other routine work is conducted "off the floor" since the staff at Summerville Manor are attempting to play down the institutional environment. Wheelchairs are not allowed in the dining area to encourage positive images within the dining space. Finger foods and nutritional snacks from the refrigerator are available at all times. Some resident's doors are personalized with reminders of the individual's favorite hobbies. By using trial and error methods to determine the appropriate means of care for each individual, the staff demonstrate a noninstitutional approach to care techniques.

Spatial arrangements of social areas   Each AD wing has a lounge at one end of the corridor. Although not a large room, the carpeted lounge appears very domestic. Furnishings consist of a sofa, end tables, a card table,

several large, high-back chairs, a covered fish tank, and a
television. Two large windows provide a view of the
outdoor wandering area (Figure 29). During the four days
the author spent at Summerville Manor seven or more of the
twenty residents of the AD wing were observed to be in the
lounge area most of the time. The lounge appeared to be a
popular place for wanderers to congregate. The wanderer's
path is located along the corridor with community space
serving as a terminus. This may be attributed to the
wing's layout as a traditional double-loaded corridor
containing activity areas at one end.

Dining room Although pleasant with the use of
floral wallpaper, plants, and residential furnishings, the
dining area was not used very much. The dining room
contains three round tables with four chairs each, allowing
for family style dining. Because of the shift eating
routine staff members use, some residents are lead into the
dayroom to participate in short activities while waiting
their turn to eat. A halfwall located in the dining room
and lounge allows for unobtrusive surviellance by staff
(Figure 29).

The kitchenette, and especially the refrigerator,
appeared to be a popular amenity for most residents.
Residents seemed not to notice the furnishings in the

dining room such as the tables except for the refrigerator and the range top which were located closest to the entry. Perhaps because they had access to snacks and finger food whenever they wished, residents may have felt more comfortable remaining on the kitchenette side of the dining room.

Care Routine: staff attitudes and suggestions

Note: The following discussion applies to staff member's attitudes concerning AD residents in phase two of the disease.

General Response: Having come from a working background at a local state-operated psychiatric hospital, several staff members stated that they better understood the needs of their residents.

Behavioral Issues

Wandering: Considered to be the most frequently occuring behavior among individuals. Usually not considered a problem due in part to having a regular established pacing route within a "self contained" wing.

Inappropriate
Behavior: Individuals lose modesty or the awareness that his/her behavior is not considered proper in public. This has potential for becoming a bad situation when family members visit. Staff reported a need for a quiet, pleasant area near or on the wing where conversations can take place without disruptions.

Communication/
Interpretation: Residents appear to no longer recognize everyday objects and often misinterpret

conversations and written information. Staff stated they must determine additional methods to trigger associations. For example, a large sheet of brightly colored construction paper containing a picture or large print helps cue associations.

The Physical Environment

Shower room:
All residents require assistance with bathing. A shower room located in the wing is reportedly used infrequently and the shower frightens most of the women residents. Instead individuals are taken to a whirlpool bath located off the wing.

Paraphrased remarks mentioned frequently by staff members

Note: The following statements represent at least two staff members similar responses obtained during informal interviews.

1. Residents enjoy the use of the refrigerator to obtain snacks.

2. Women residents are frightened by the sound and sensation of taking a shower.

3. Residents appear to like having their personal items displayed.

4. A "quiet chair," used by staff for residents who need to calm down, is located away from areas of stimulation. Residents may go to sit with an attendent for a short period of time.

5. The use of additional cues such as pictures, drawings, and large print appear to help some residents with daily tasks.

6. Several new programs are being implemented to

improve the care of AD residents:
The educating of all facility staff about the
care routine needed for an AD resident is now
manditory.

7. A support group consisting of staff and
   family members has been formed to help cope
   with stress and other issues.

Conclusion

The following information represents a compilation of

suggestions discussed by various staff members from

the four case study facilities visited. Some of the

following information is repetative of information

discussed previously in each case study facility. The

following comments are given equal importance and are not

catagorized by which staff member (administrator, DON and

nurse's assistant), gave which reply. The following

information consists of paraphrased remarks reported by

staff members during individual interviews and group

discussions.

1. A nurse's station positioned for viewing down
   corridors and into social areas can be useful.

2. Restrict visual access to areas that are off
   limits to the AD resident.

3. Provide an area where the staff can view the
   residents when they are outside.

4. Color coding alone is not enough for corridor
   identification.

5. Because of the extra assistance sometimes needed
   for AD residents in the bathroom, there is a need
   for larger bathing areas.

6. There is a need for a calming environment. Therefore there is a benefit to appropriate color usage and perhaps the use of piped in music.

7. The use of an intercom system only serves as a reminder of an institutional environment. A crackling voice over an intercom can interfere with conversations and confuse residents who may search for the voice.

8. Better task lighting is needed in residents' rooms, especially near the bed, in order for staff members to evaluate residents' conditions.

9. There is a need for separate examining rooms for men and women.

10. Textured grab bars should be placed within easy reach in the bathrooms. Elderly persons lose sensitivity in their hands and cannot tell how tightly they are gripping a grab bar. There is a need for grab bars to be wider in diameter. Staff members do not like the grab bars behind the toilet.

11. There is a need for a glare-free environment, although carpeting is not always desired by staff.

12. Maintain a definite corridor, but supply residents with small activity alcoves for small supervised group activities. The use of a half-wall would maintain the visual line of the corridor while providing semi-private spaces.

13. Differentiation is needed between the wall surface and the floor either through the use of color or material textures.

14. Provide visual diversions in the hallways and activity areas that the residents can enjoy without being able to touch.

15. Reduce the number and frequency of corners and hidden areas.

16. There is a need for recessed handles, not levers on doors in areas where the AD resident should not go such as the utility closets.

17. Recessed wall waste recepticals would be better
    utilized by staff members. AD residents have a
    tendency to pick up and walk around with anything
    that is not secured.

18. Provide an area or room where the agitated
    resident may go to calm down.

19. Rather than chests of drawers in residents' rooms,
    provide closets with doors that can be locked by
    staff members.

20. Provide an area for personal display within
    resident's rooms.

21. Locate toilet facilities as close as possible
    to dining facilities.

22. Supply, maintain safety and surveillance, access
    to kitchen facilities.

23. Supply an area away from the Alzhiemer's wing
    where staff may go to relax, preferably with
    access to a kitchenette.

24. There is little need of concrete outdoors
    (walkways, etc.). Any change in surface treatment
    (seams etc.) may catch the already unsteady
    shuffling foot of an AD resident. Some staff
    members report that a well maintained lawn on
    level ground is safer.

25. Provide a room close or adjacent to the AD wing
    so visiting family members may stay overnight.

It is the opinion of the author that some of the

suggestions are more sympathetic to the "Medical model"

approach to care. For example, suggestions pertaining to

the control by staff members over the type of access

resident's have to their personal items and the fact that

domestic elements such as carpeting are not desired, both

demonstrate the limitations residents have over their

environments due to the facilities organizational policies. However, the suggestions offered by staff do provide a foundation from which designers may generate thoughts or questions on various forms of appropriate care environments.

The following chapter will explore suggestions and criticisms concerning conditions in existing facilities. Based upon information gathered through the case studies and the literature review, environmental design suggestions will be stated and analyzed. Examples of an institutional approach to environmental design will be discussed along with a residential approach to design.

In reference to the discussions with staff members, the author notes various components of the physical environment contribute to difficulties staff members encounter with residents' behavior. The author believes, through information gained in the case studies, that double-loaded corridors, signage systems (lack of appropriate ones) and lounge areas that lack opportunity for stimulation (through location, material treatment, etc.) contribute to difficulties encountered regarding residents' behavior. The following chapter will explore the relationship between residents' behavior and physical components of various site specific environments.

DESIGN SUGGESTIONS

Case Study Analysis

Visits were conducted at five sites which were considered long term care facilities. Two of the facilities were CCRCs, and three were nursing homes. The fifth case study was conducted at a facility that just recently had opened. No residents had moved in when the visit was made, therefore very limited information was gathered concerning staff members attitudes and suggestions for the care of AD residents. The conclusions and recommendations outlined below are based on visits to four of the case study sites.

Administration goals

Based on informal open-ended questions rather than formulated methods, e.g., standardized questionnaires, each visit included inquiries regarding the facility's overall goals concerning the care of residents by staff. Assuming that administrators at each facility had clear directives towards supportive environments for dementia residents; open-ended questions were asked of all staff members. The author found that the administrators do have definite goals pertaining to the care of their residents. However, the goals do not directly translate into a language of design. In most cases, the goals expressed were found to be of a

general nature, e.g., enhance the quality of life, care
fitting the needs of each resident, etc. Despite these
general forms of description, it is possible to extrapolate
information gained from the case studies into several
topics.

Based upon the author's case studies these topics are
listed below as follows:

1. residential vs. institutional appearance,

2. integrational vs. segregational approaches to
   housing AD residents,

3. levels of care provider stress, and

4. issues pertaining to independence and safety.

The above topics are categorized according to three
factors previously discussed in the Literature Review (pp.
36-38 herein). Through current readings, it has been
deduced that the need to develop environmental design
suggestions is based upon three separate but interwoven
factors as follows:

1. The loss of cognitive functions by AD residents,
   i.e., confusion, and problems of wayfinding and
   orientation.

2. A general lack of environmental stimuli, i.e., the
   "medical model" of design.

3. The stress placed on overworked care providers who
   become interpretors for a confusing environment.

It has been found, through the use of case studies, components of the physical environment that can be influenced by and in turn influence the previously mentioned three factors needed for design suggestions. The following table represents a content analysis performed in order to operationalize information gathered from the previous chapters. Cartwright (1959) defines content analysis as a process in which gathered information is classified in an orderly manner. The remainder of this chapter will discuss the facts in Figure 30.

Loss of cognitive functions by AD residents	Lack of environmental stimuli in the facility	Levels of care-provider stress experienced by staff members
Independence and safety	Residential vs. institutional atmosphere	Levels of care provider stress
A. wandering paths	A. double-loaded corridors	A. care provider stress
B. spatial implications	B. personal-	B. activities group vs.indiv.
	C. activity area and lounge	C. staff lounge
Intergration vs. segregation	D. signage	D. spatial implications
	E. spatial implications	
A. care provider attitudes		

Figure 30. Factors necessary for environmental design suggestions based on case studies

Loss of Cognitive Functions by AD Residents

Independence and safety

Staff members mentioned a desire to maintain a level of safety without preventing residents from maintaining autonomy and control. An example of this is demonstrated at Summerville Manor, in which staff members kept a lock/timer on the kitchen range, yet allowed 24-hour access to the refrigerator. Thus, residents were able to function with emphasis placed upon their remaining abilities.

The design of the secured wings at Summerville Manor and Orchard Manor both allow residents to go wherever they wish within the confines of each secured wing. Wandering is not considered by staff members to be a great difficulty due in part to having a regular established pacing route within a "self contained" wing. Residents who wander and those who do not both may gain a level of security while "exploring" their surroundings.

Wandering paths. The literature does not provide clear directives about what is considered a "good" wandering path. According to the case studies, wandering is a dominant behavior/activity for AD residents. Variety in the environment may or may not have an impact. Based upon the readings and research of the case studies, no clear direction nor observation could be made by the author. But the general reaction from interviewees indicates a

preference for wandering paths that include outdoor spaces and are designed for that purpose rather than relying on the traditional corridor as a solution to wandering. This attitude translates into environments that are less institutional and more acceptable to care providers and family members. However, the author noted several of the four case studies' facilities use the corridors solely as a wandering solution, perhaps due, in part, to economic and safety constraints.

<u>Spatial implications</u>   The predominant organizational pattern of wandering paths in each of the four case studies involved a linear corridor with a straight path. According to Cohen and Weisman (1988), this type of geometry usually occurs in the "medical model." This institutional approach exists where residents' rooms are on both sides of a corridor, eight feet wide, with a nurse's station occupying a prominent position. Cohen and Weisman (1988) state that in the worst cases, the wandering paths end in fire doors and stairs, making control difficult. Of the four case studies discussed, all had straight "medical model" wandering paths and contain fire doors at a terminus (Figures 31 and 32). Watching residents will reveal if there is a typical wandering path; if so, a pleasant more domestic living or activity area might be set up at each end of the path.

The living or activity areas can serve as solutions to wayfinding and orientation problems of AD residents. By placing living/activity areas at the ends of wandering paths, landmarks and orientation cues are set up by which residents situate themselves in relation to destinations or goals. In two unrelated studies (Berkeley, 1973), users of a setting became angry, and indignant in response to difficulty in wayfinding (believed to be a cause for wandering) through the settings. This behavior is seen in AD residents when they encounter stimuli that confuse them. This behavior is termed a "catastrophic reaction" which includes extreme emotionality, and anger.

As previously stated by staff members from Heather Manor, catastrophic reactions occur in the corridors for no apparent reason. However, the repetition in material treatment of corridors, the excessive length, and apparent lack of orientation cues (such as window placements) all may contribute to the agitated state of AD residents who are unable to determine where they are at. Shared living areas may serve as landmarks that help orient persons and serve as a magnet or goal for residents to arrive at (Figure 33). By placing these landmark areas at the end of corridors, a resident has visual access, the ability to see a goal before actually arriving there (Weisman, 1979). In addition, any ongoing organized activities in these areas
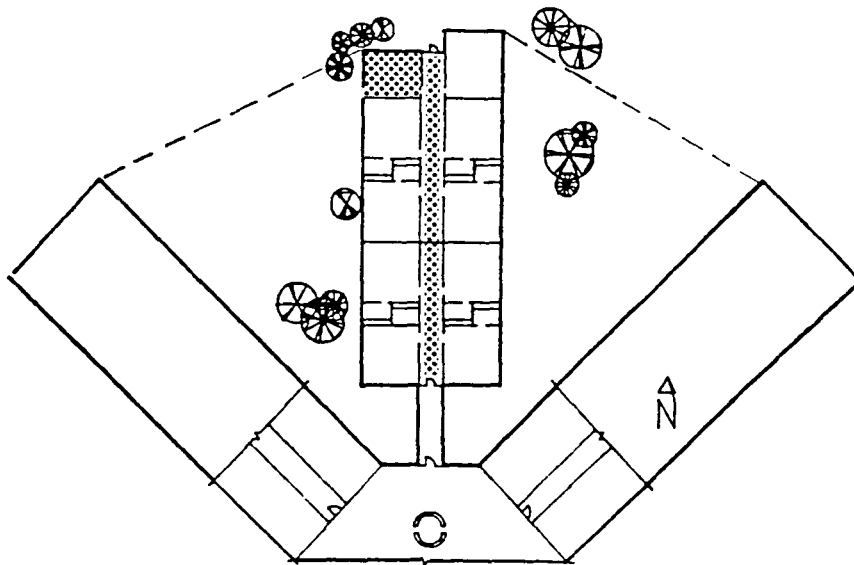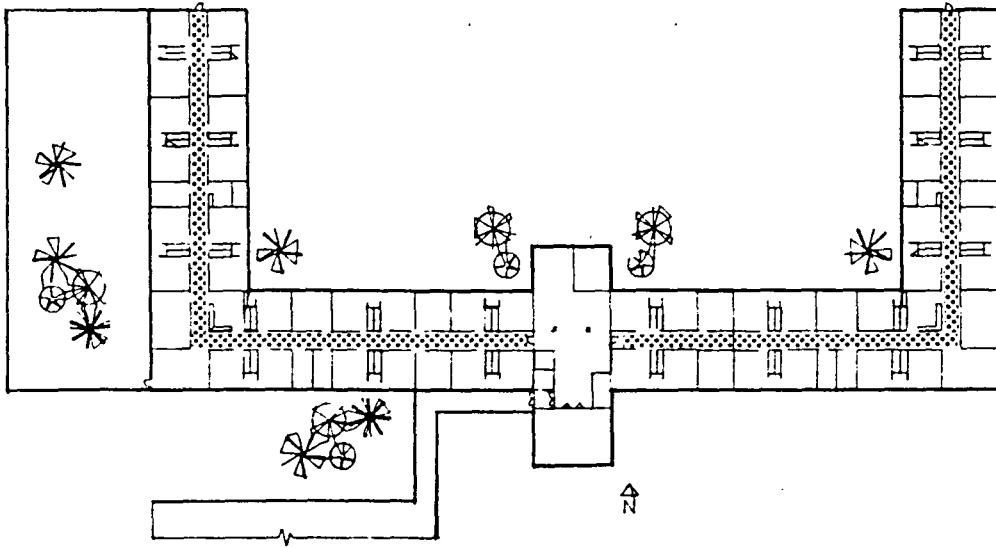
Figure 31.   Wandering path of Heather Manor and Orchard
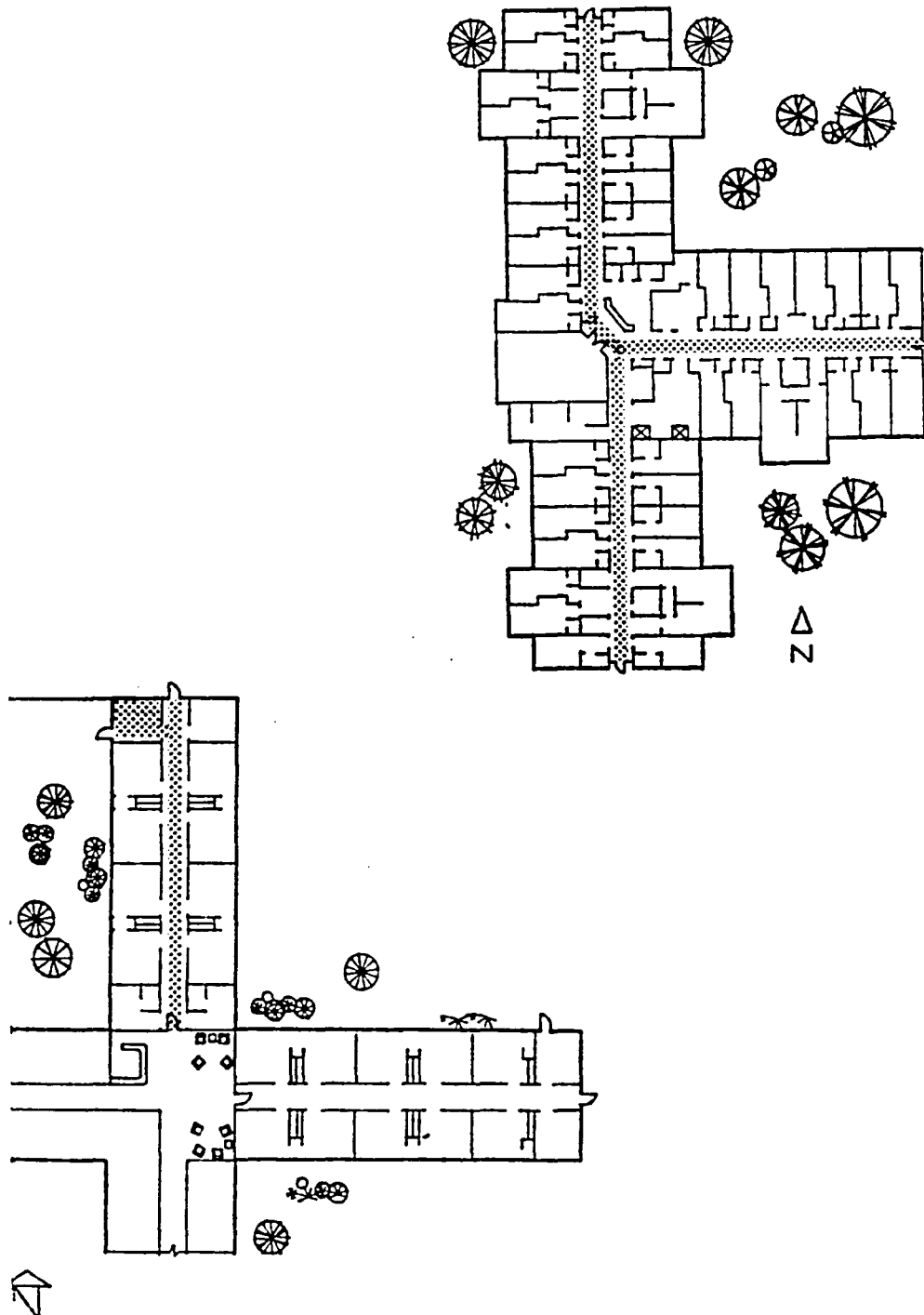   Manor Nursing Center

Figure 32.   Wandering path of Hickory Park Nursing Care
Facility and Summerville Manor

might encourage a person to join in instead of walking the corridors.

Integration vs. segregation

Care provider attitudes   The general consensus of interviewed staff members is that AD residents should be segregated from other elderly residents. The reason for this consensus is based upon the convenience of the care providers. The staff members of Hickory Park Nursing Care Facility reported that it requires more patience and energy to run between intact and confused residents. Concerns by family members of other elderly residents are directed toward possible negative effects by coming in close contact with AD residents (McPherson, 1983; Cohen and Weisman, 1987). There is no hard evidence as to which philosophy is the better one, integration or segregation. It is apparent, through informal interviews, that those staff members most closely associated with AD residents oppose measures of integration.

The Lack of Environmental Stimuli

Residential vs. institutional appearance

General observations   A number of staff members stated a desire to minimize the institutional character of their facililty. This was demonstrated in two facilities
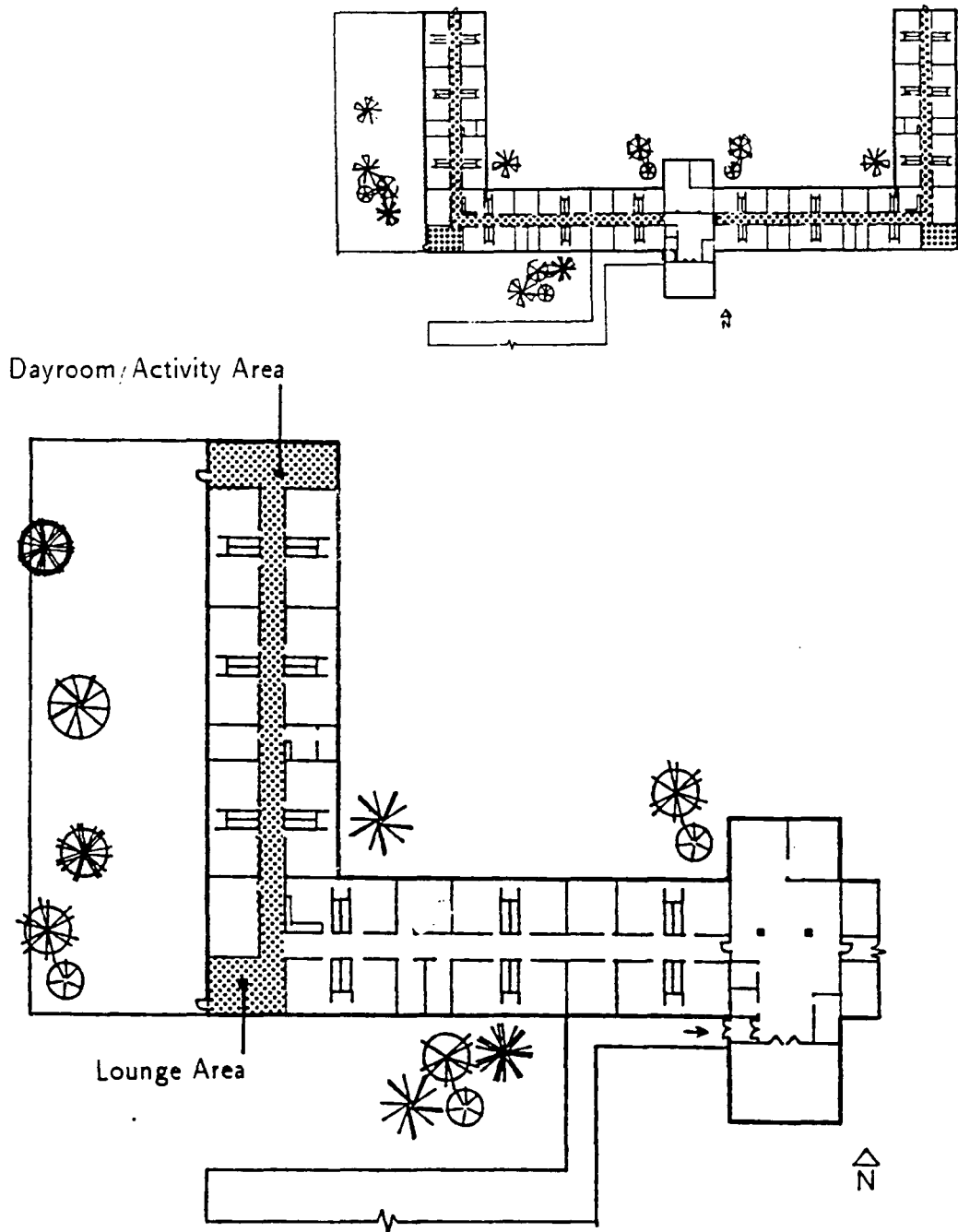
Figure 33. Floor plan of shared living areas at Heather Manor

that contained secured wings. A secured wing allows residents to move about freely within a limited area. The use of domestic style furnishings and finishes in the dayroom and dining room areas of a secured wing supports a residental atmosphere. When using verbal references (expressions that the residents may be familiar with, such as kitchen and dining room), a purposeful attempt is made by staff members to create a more domestic ambience.

There are several reasons for encouraging a non-institutional image in a nursing home facility, for example:

1. Several studies have shown that a non-institutional image has a potential for encouraging more frequent visits by friends and family members (Lawton, 1981).

2. The majority of persons with AD are admitted from their homes to a nursing home setting. According to Carpman (1984) these new settings should maintain familiar ties for the AD resident.

3. A forgetful person needs additional time to learn his/her way around a new environment. Carpman (1984) and Weisman (1982) state that involuntary change and moves for the older person can be a source for severe stress and depression. Thus,

the institutional atmosphere should be reduced.

A facility that is modeled or patterned after the outside community using domestic imagery can support AD residents in retaining these ties. Based upon staff members opinions, residents mimic their environments therefore, that same environment has the potential to reinforce once familiar behaviors of residents.

The author recognizes that nursing homes are at a different scale than single family dwellings. However, certain design processes can break down the institutional scale and character of a facility. A well acknowledged method of breaking down an institutional scale to a more human level can be achieved by fragmenting a larger building mass into a greater number of smaller pieces (Ching, 1979). On the interior this fragmenting can be achieved by breaking down the organizational policies as well as the physical environment.

The staff members of Summerville Manor implement an organizational approach to care including "symptom management". This means that the policy of staff members includes retaining positive qualities in an AD resident's daily activities allowing the resident some degree of autonomy. The interior physical environment supports this therapeutic approach to care through the existence of a 24-hour access kitchenette. Furthermore, the designers of

Summerville Manor avoided, on a restricted level, the use of "hard architecture" which is usually seen through the use of plastic laminate and tiled materials. The use of finish materials (wallpaper prints, carpeting, and paneling) that echo the family type environment many residents come from, support the therapeutic efforts of the staff members at Summerville Manor (Figure 34).

Double loaded corridors   A predominant organizational pattern in all of the facilities is the consistent use of a traditional model for corridor layout. The most fundamental organizational pattern is the traditional corridor, e.g., a double-loaded linear corridor configuration (Cohen and Weisman, 1988). The traditional corridor is exemplified in the case study facilities. Resident rooms line both sides of the circulation path and communal areas are located at the terminus of the corridor.

Despite the fact that two of the facilities either constructed or renovated a wing solely for AD residents, each AD wing contained the same modular system for room and corridor layout as the rest of the facility. Residents' rooms, whether private or semi-private, follow a traditional institutional model containing hospital beds, privacy screens, and shared bathrooms.

Hickory Park and Heather care facilities both have nurse's stations placed in prominent locations, apparently for

Carpet

Wallpaper (Floral Print)

Wainscoating

Tile Flooring

Dining
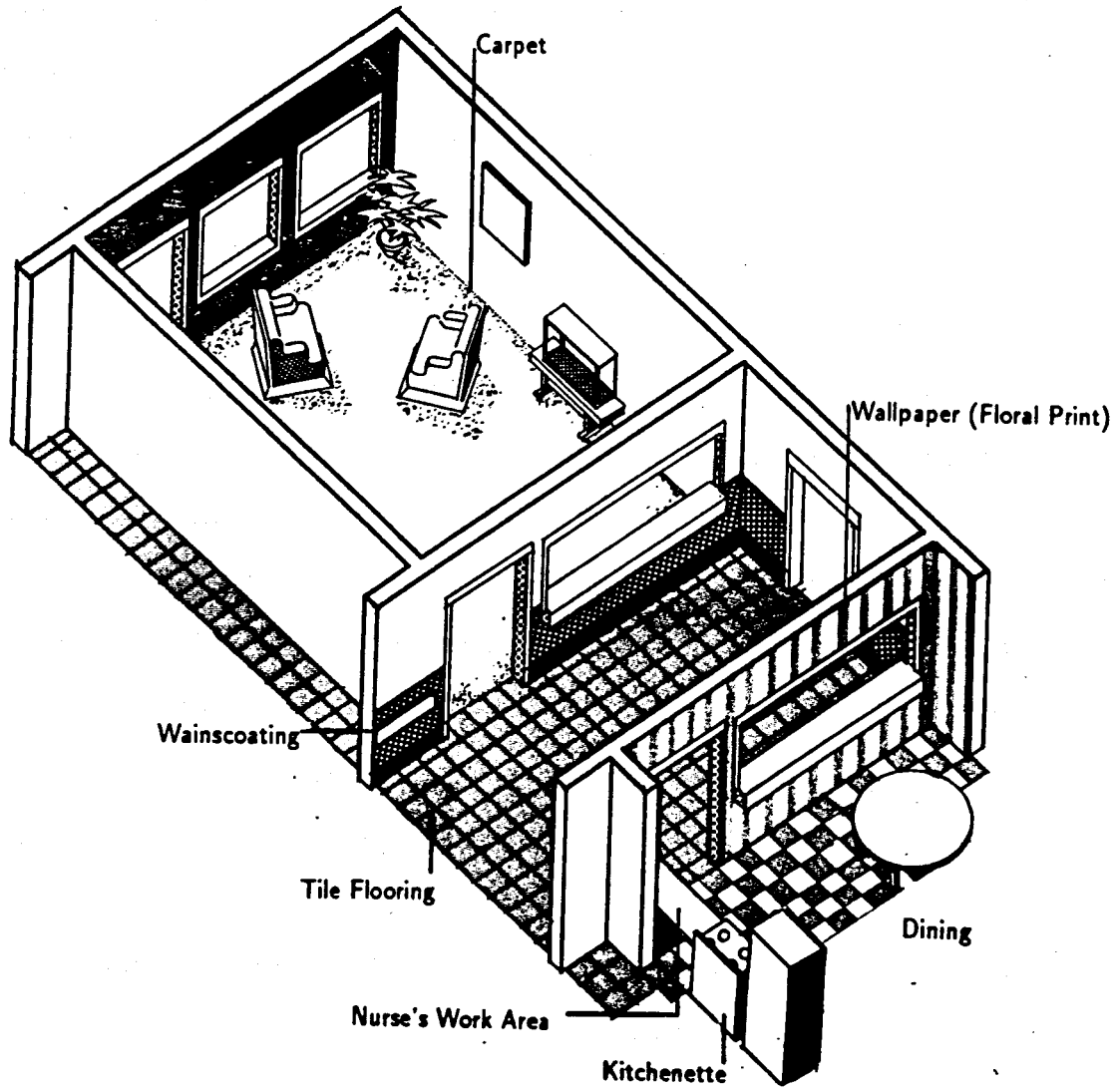
Nurse's Work Area

Kitchenette

Figure 34. View showing material treatment of dayroom and kitchen areas at Summerville Manor

easier surveillance and control. The presence of a nurses'
station is diminished to a shelf and a desk in the secured
wings of Orchard Manor and Summerville Manor. Charting and
other important paper work is done "off of the floor" with
fewer interruptions. With the absence of a nurse's station
in the secured wing, one of the most obvious references to
institutional care (the other being double-loaded
corridors) is removed (Figure 34).

Spatial Implications. Staff members of both Heather
Manor and Hickory Park Nursing Care Facility state that
difficulties are encountered in the corridors. The staff
of Heather Manor report that, excessive lengths of corridors
makes it difficult for staff to immediately come to the aid
of a resident. Hickory Park Nursing Care staff members state
that a few residents become disoriented in the corridors.
In some instances, disorientation leads residents to become
either defensive, aggressive, passive, or confused.

Both facilities house confused persons who are able to
wander for great distances. Heather Manor is a large
facility organized solely for AD residents. Confused
persons have the opportunity to wander beyond their own
wing. The family care philosophy of administrators at
Hickory Park Nursing Care Facility, based upon the idea of
integration, allows confused residents to wander throughout
the entire facility. Residents of Hickory Park who are not

familiar "neighbors" and do not recognize the confused resident are of little help in relocating him/her. The repetition of material treatment and the great lengths of corridors in both facilities, add to the frustration level of a confused resident.

Alternative organizational plans and design concepts in both rennovation and new construction, serve as better support for AD residents and staff members. Carpman (1984) states that success with demented persons was found when resident rooms were grouped around a social area and their world was kept relatively small (literature points to AD wings of eight or fewer persons as ideal).

Long corridors need to be differentiated. Corridors can be enhanced by providing views into major spaces as well as views outside. Greater visual access to a space leads to a greater desire and willingness to explore that space (Weisman, 1982). According to Green (1987) corridor segments should ideally not be more than 50'-75' in length.

Calkins (1988) states that when there are multiple, similarly designed corridors on the unit, residents might confuse them with each other. Each corridor should maintain a distinct character. According to Carpman (1984) and Calkins (1988), the most noticeable means by which corridors can be distinguished is through the style and placement of furnishings and color when its combined

with different wall treatments (Figures 35 and 36).

Personalization   Staff members stated that, generally speaking, little personalization took place at their facility. The author noted that the staff members of several case study facilities contributed a lack of personalization to a lack of available space in the residents' rooms. Staff members of Heather Manor believe that a lack of personalization is due to residents who exhibit no sense of territory over any particular area or item. Due to observations that residents do not appear to recognize which bed is theirs or which closet holds their articles, staff members at Heather Manor believe that the concept of personalization is inappropriate for residents with Alzheimer's disease. However, the staff members of Summerville Manor stated that the opportunity for personalization encourages conversation among visiting family members and residents, as well as between staff and residents. Staff members of Summerville Manor observed that a few residents appeared to gain pleasure from exhibiting their possessions.

According to Cohen and Weisman (1988), the institutional approach in nursing home care, e.g., continuous "heavy care" for what is a highly dependent group, leads to social and physical characteristics of dependency, a "hospital." Therefore, the environment
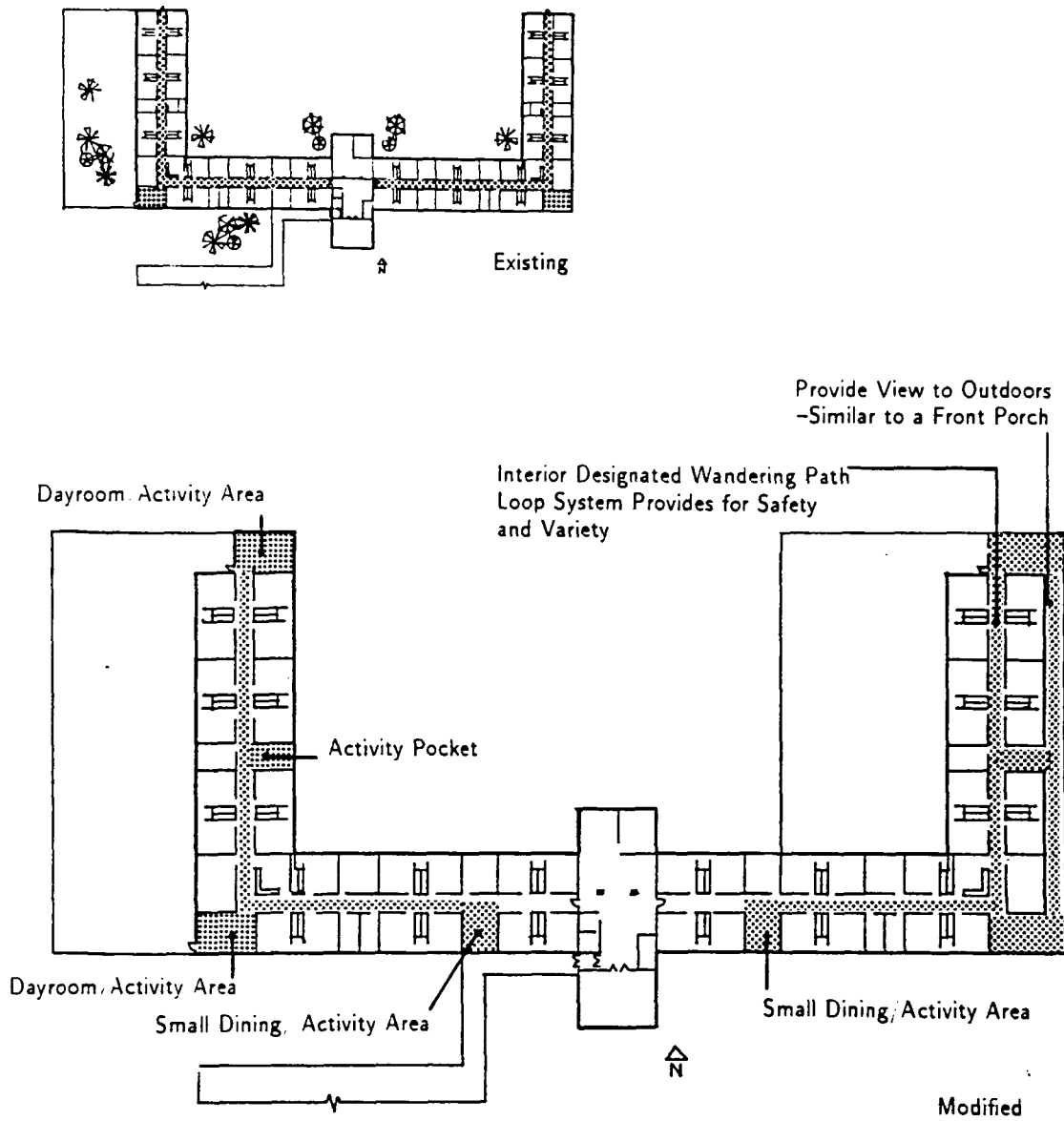
Figure 35. Modified corridor treatment at Heather Manor

Staggered Corridor Reduce Long Vistas

Provide Variation in Corridor Treatment
Gain Distinct Identity in Each Corridor
Through Use of Finish Materials

Small Activity Pockets Can Maintain
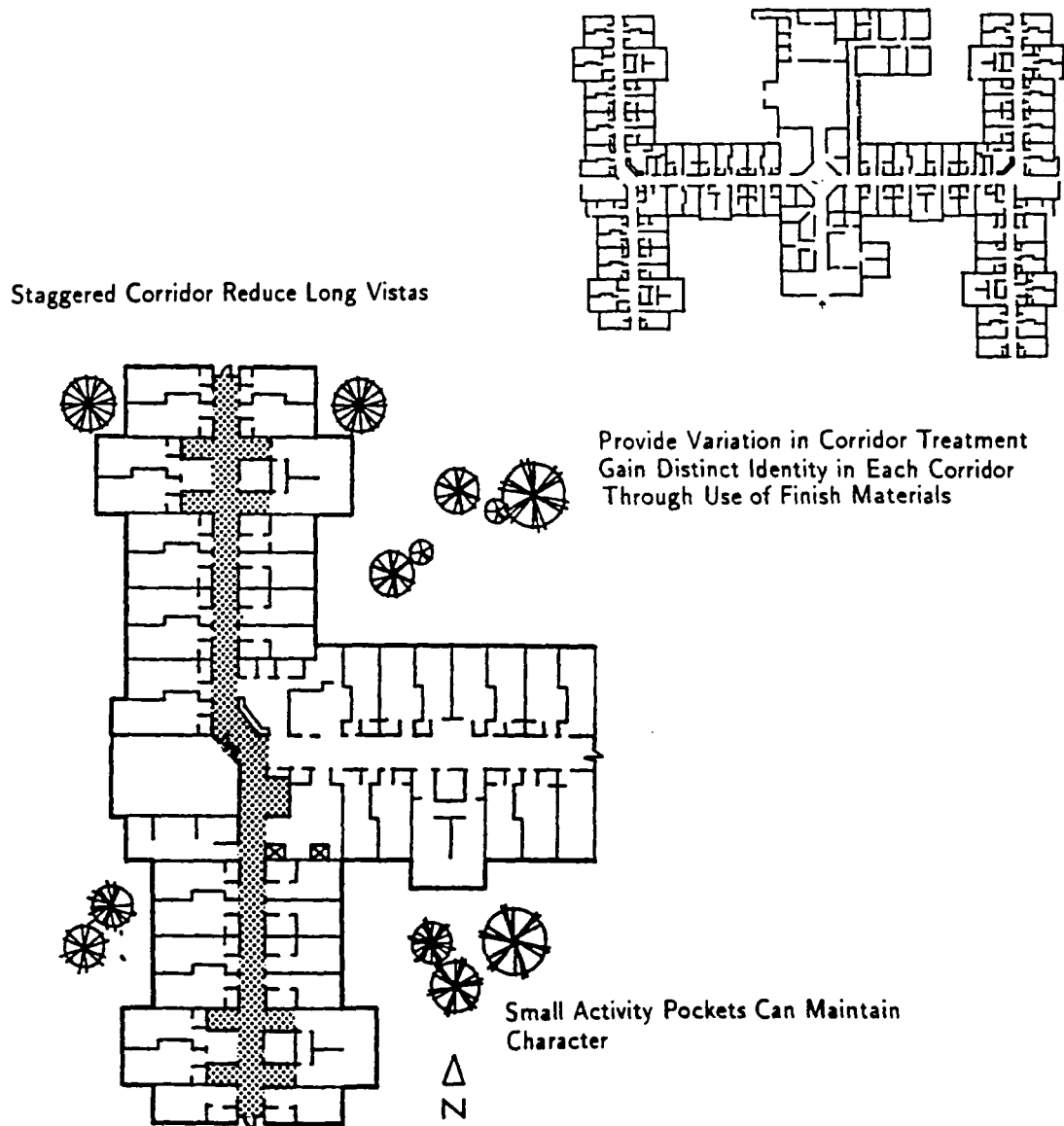Character

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N

Figure 36. Modified corridor treatment at Hickory Park
Nursing Care Facility

becomes supportive of a "medical model" in which the concept of personalization has little opportunity for application.

Spatial implications   Heather Manor is an example of the institutional approach in nursing home care (pp. 41, 44 herein). Sensory and social deprivation exists in the organizational and design policies of Heather Manor administrators. This is demonstrated through the general response given about staff attitudes (p. 49 herein). Staff members believe that residents are so far along into the disease process (phase three pp. 20 herein) that they do not know where they are most of the time. However, readings indicate that long term memory is retained for an extended period of time in persons with AD. Thus, allowing ties to once familiar residential surroundings may enable residents to maintain a level of comfort and control over their personal areas (Figure 37). Personalization may be manifested in terms of both the organizational and design policies. Allowing a resident limited control over his/her personal environment including, bringing of personal items from home or choice in selection of bedspread or drapes enables a resident to make limited decisions.

Activity areas/lounges   The dayrooms in the two secured wings are adaptive reuses of private rooms. In every case study, the major connection to the outdoors is

provided through a dayroom or lounge area. In all of the
facilities except Summerville Manor, the dayroom area is
a separate space which is not visually connected to the
central space, e.g., the corridor. This type of spatial
subdivision does not contribute to a domestic character for
the wing. The author found all of the dayrooms to be
either crowded tight spaces or as displayed by Heather
Manor, a sparsely furnished extension of the connecting
corridor. The two case studies containing secured wings
have dayrooms with more domestic furnishings, while the
design of Heather Manor opens up a corner of the corridor
and contains gerichairs lined up near the nurse's station.

The author noted an emerging design concept, an
outdoor space partially enclosed by the building and taking
the form of a courtyard. This concept was noticed in the
two most recently constructed facilities (Orchard Manor and
Summerville Manor). The courtyard becomes well-defined by
being enclosed having the wandering path developed along
the perimeter (Figure 38). Hall, Kirschling and Todd
(1986), state that enclosures such as buildings are much
more pleasing than a fence and allow for unobtrusive
surveillance from staff members.

Signage   Environmental cues for wayfinding and
orientation are somewhat lacking in the case study
facilities. Orchard Manor Care Facility utilizes mega-
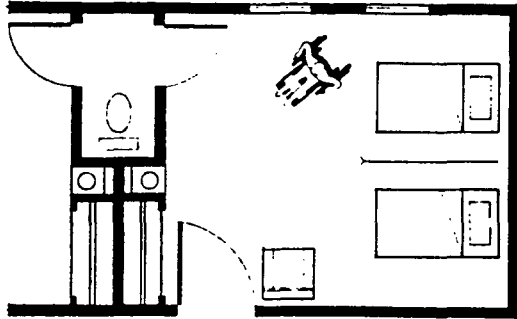
Existing

Through Furniture Placement
Provide Areas For Personal Items
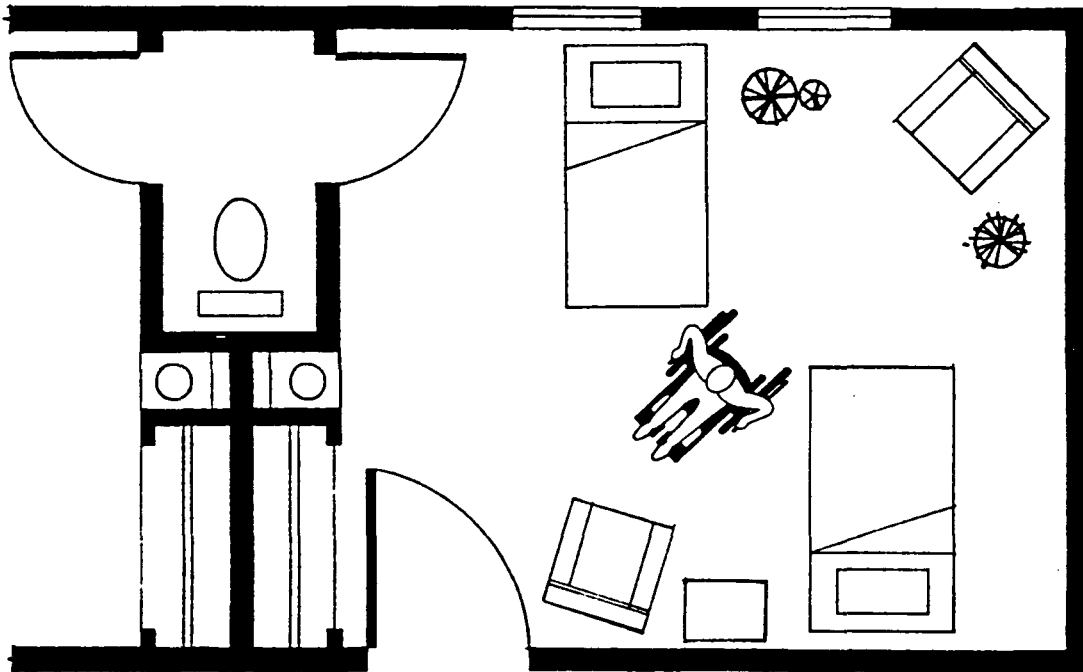
Modified

Figure 37. Resident's room at Heather Manor

graphics in the form of large brightly colored numbers
present on the floor and walls of wing entrances. This form
of orientation serves as limited help to a complex
environment. There is potential for disorientation when no
cues are present to guide a person to a wing, prior to the
number displayed on a wing entrance. No one element can or
should work in isolation. Sinse the emphasis is on the
development of an efficient clear wayfinding system, there
should be a number of guiding, reinforcing cues (Carpman,
1984).

In all but one of the case study facilities, signage
is limited to small inconspicuous plaques attached adjacent
to identified areas. The facilities use plaques of small
dimensions having letter height usually no more than 5/8".
It is the author's opinion, the size and style of the
signage used is mainly for the benefit of staff members to
identify residents' rooms.

Spatial implications   According to research
conducted by Koncelik (1976), and Green (1987), high
contrast signs work best for elderly eyes. White
characters on a dark background are reported as the best
technique. Simple letter styles are more effective. Every
nursing care facility visited used a simple, bold type
style. However, information could only be read from short
distances (less than 10 feet) due to the letter height.

A technique to enhance signage is through the use of color. An older person has a decreased ability to discern different color chromas, hues, and values (Carpman, 1984). This can decrease the older person's depth perception. However, the use of color contrast in an environment can enhance an older person's depth perception and help in negotiating the environment (Carpman, 1984). Rabins and Mace (1981) states that in designing facilities for older persons color contrast is an important principle to consider. Complementary colors (opposite colors on the color-wheel), reportedly function the best. However, another current school of thought defends the use of earth tones. Reportedly the earth tones represent the colors and hues most often used in residential environments. Effects of color are always temporary. An environment in one color will tend to visually fade out and lose its psychological impact.

Issues of Care Provider Stress

Care provider stress

Not to be undervalued, care provider stress is a topic noteably brought into discussion at every facility visited. No evidence was found as to whether a secured wing provided less opportunity for stress in care providers as compared to facilities which integrated AD residents with others.
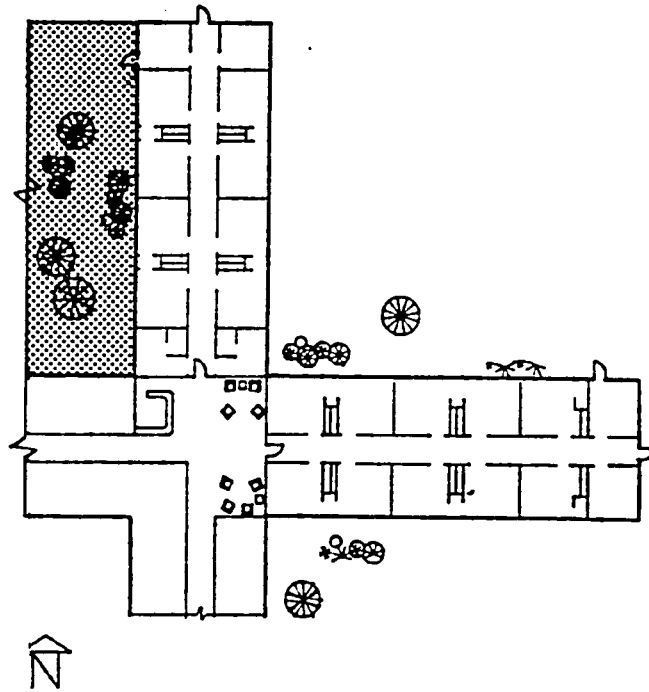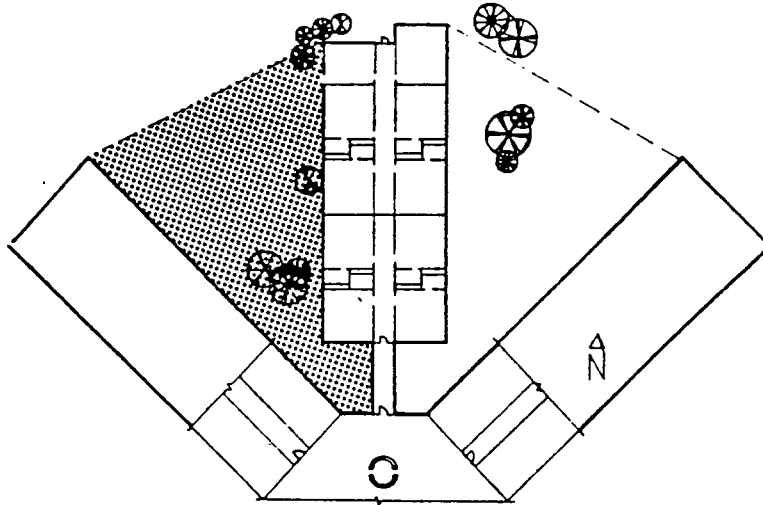
Figure 38. Outdoor wandering areas at both Orchard Manor
and Summerville Manor

All staff members reported that AD residents are "heavy care" residents, requiring more attention than any other resident.

The administration of one facility remarked on having a rather large "turn over" in nurse's assistants (Hickory Park Nursing Care Facility). This prompted the administrators to initiate an incentive program that gives financial aid to any nurse's assistant wishing to pursue a degree in the nursing field. Programs and incentives are becoming necessary in order to meet the increasing pressure being placed on the providers of "heavy care" residents.

Another nursing care facility has implemented a support group that deals with the stress management for care providers. According to a majority of the staff members interviewed, consistant staffing is important in the care of AD residents, sometimes more important than the educational qualifications of the staff. AD residents require more direct care and not highly technical procedures. Most staff members agreed that it is best to have more aides per resident and one skilled supervisor to care for a wing. Staff members believe that all facility staff should be trained and licensed to work with confused residents.

Activities group vs. individual   This topic was discussed with pride at every facility visited. A majority

of staff members interviewed expressed concern for the programming of activities aimed at helping residents focus on their remaining abilities. A staff member at one facility helped several residents identify their bathrooms by writing in large print, over 2" in height, the word "bathroom" on brightly colored construction paper and taping the sign to the bathroom door. This provides the resident with an additional opportunity to locate the room. In addition, the resident avoided associating the bathroom with closet space. Due to caring staff members who take extra time to experiment and develop individual methods of help, opportunity is provided for identification and recognition.

Depending upon the philosophies of care enforced by each facility, there is a wide range of activities, especially group-based events. This can be particularly advantageous for residents in advanced phases of AD when the concept of "individual activity" does not mean very much (Gwyther, 1985). Some of the common activities stated were music therapy, activities revolving around domestic chores, organized arts and crafts projects, and reality orientation therapy. Group outings were not mentioned, but it is noted that residents do go on outings with family members.

Spatial implications   The range of activity
programs has implications for design. For example, when
reality orientation is the focus of activity, staff members
supply additional reality cues and associations similar to
the example stated previously. Several of the facilities
visited contain kitchenettes in which residents can conduct
once familiar activities under supervision. As stated,
there is a wide variety of activities, however the author
noted that the facilities with secured wings had the most
variety available to residents. This can be attributed
to the fact that staff of secured wings can spend more time
with residents helping them to maintain certain daily
functions, while the staff members of the facility without
a secured segregated wing spent a majority of their time in
surveillance and security. All staff members appeared to
care very much about the residents and stated that "their
days are very full."

Staff lounges   Several of the case study facilities
reported having a staff lounge or respite area not adjacent
to the nursing care wings. The staff preferred the
arrangement to previous ones they had experienced at other
facilities, e.g., staff lounge adjacent to a skilled care
unit. This suggests that staff members desire some control
over physical and visual contact with the rest of the
facility.

Spatial implications   Staff reported that a retreat

space should provide opportunities for seating, food

preparation, and secure storage of belongings. Sound

insulation was also stated as being of primary concern,

especially with respect to the sounds made in adjacent

corridors. Most retreat areas visited were situated at

the core of the buildings, one being close to a utility

area. This suggests that a lower priority is placed on the

therapeutic needs of staff members when allocating space

requirements.

Conclusion

It is the author's view that a residential atmosphere

in an environment is a basic concept in design which can be

implemented in many ways for more of an impact, including

the use of:

1. floor plans other than the sterile symmetrical

    organizational pattern, e.g., the "medical model,"

2. levels of stimulation, other than the sterile

    repetitive uses of finish materials in wings, and

3. furnishings other than hospital beds with privacy

    screens and gerichairs.

Once the designer, A) becomes aware of particular

environmental needs of AD residents, and B) understands

organizing/design systems in current use, and C) becomes

familiar with specific goals for a special wing, the actual
design process can begin. It should be remembered that
most AD residents will eventually progress beyond the phase
by which the physical environment can act as a support
system. These residents will require a more intense social
support system to help them complete most daily tasks. For
awhile it is possible to combine both a physical and social
system to help AD residents and the staff members who
provide the most care for them in maintaining an optimal
living and working environment.

CONCLUSION

Discussion

Various studies concerning the demographics of aging indicate that the only notable group to experience marked growth will be persons over the age of 55. Those over the age of 85 will make up the fastest growing age group in the country. It is reasonable to assume, based upon the demographic shift mentioned in the readings, there will be a large demand for housing in the elderly community. It is widely accepted that long-term care facilities are the best alternatives for older persons who can no longer manage more independent environments. However, interviewed staff members indicate that a long term care facility is the only economic option available to households containing persons suffering with AD.

Results from the Literature Review

Findings from the Literature Review indicate that the majority of the nursing home residents are primarily physically stable, but functionally impaired older persons admitted from their homes. At least one-half of the nursing home residents have some form of dementia. Therefore, the designer's challenge is to de-emphasize the effect of limitations through an appropriate environment and therefore, limit the effect of a disability. The

author determined factors a designer should be aware of before designing an appropriate environment.

As determined through readings in the Literature Review, the development of environmental design suggestions stems from three separate, but interwoven, factors:

1. the loss of cognitive functions by AD residents,

2. a general lack of environmental stimuli, i.e., the "medical model" of design, and

3. the stress placed on overworked care providers who become interpretors for a confusing environment.

There can be no argument that becoming more independent, or getting more stimulation, is preferable to dependence or stimuli deprivation. A more supportive physical and social environment conveys the message. While the end result will still be the same (total dependence and death), the day-to-day life of an AD resident can be made more comfortable (Lawton, 1981).

Case Study Research

In order to understand the limitations associated with the design of special care wings in nursing home facilities, it was necessary to research case studies. The author became familiar with the needs of persons within the nursing care setting and the physical environment associated with long-term care facilities. The information

gained from the case studies was applied to the factors associated with the design of an appropriate environment. Thus, environmental design suggestions could be extrapolated and applied to specific sites. Despite the fact that generalities can be drawn from the design suggestions, the author believes that a specific site analysis should be conducted. The actual design process can begin once the designer:

1. becomes aware of particular environmental needs of AD residents,

2. understands organizing design systems in current use, e.g., the secured wing, and

3. becomes familiar with specific goals for a secured wing.

Hierarchy of Intervention

Environmental psychologists maintain design intervention in various forms as having a positive potential, yet nothing close to their idea is being considered except in very few environments. As the lack of congruence between the need for and method of intervention has produced a mere modification of "medical model" design: demonstrated by the case study facilities, suggestions stated by staff members convey a genuine need for updated intervention through the use of the physical environment.

Contained within the suggestions is a hierarchy of responses based upon interventions in current use.

Categories of intervention

A major form of intervention in current use is "secured wing" design. The actual existence of "secured wings" achnowledges there is a need for special environments for AD residents of long-term care facilities. However, in relation to the case study facilities, full use is not made of the environmental opportunities.

Space reallocation   The most prevalent category, under intervention by "secured wing" design, is the reallocation of space. By referring to case study facilities, an example of reallocation is the conversion of a storage area and a resident's room into a dayroom and a kitchenette/dining area. Retrofitting of existing facilities is accomplished through interior design treatments. The application of these design treatments is in the form of interior finishes such as:

1. wallpaper - a means of adding variety and a method of reinforcing residential aspects to the environment,

2. carpeting - nongloss, nonskid surface that is residential in appearance and prevents falls,

3. color treatment of walls - enhances a residential surrounding,

4. and the arrangement and types of furnishings.

Furnishing types include:

    a. range,

    b. refrigerator,

    c. sturdy, highback chairs and sofas, and

    d. inclusion of personal items from

       home, e.g., piano, television, fishtank,

       etc.

This type of interior design treatment can be applied during annual maintenance schedules. These treatments contribute to behavioral concepts connected with personalization, territory, and privacy, among others (pp. 111-125 herein). The potential for more frequent visits from friends and family members is also present.

Furniture placement   Another category of intervention is applicable through furniture placement. This category of intervention was used very little in all the facilities visited. Several reasons may be attributed to the fact that staff members are not aware of the positive potential for appropriate furniture arrangement, and do not desire the increased work load required by the movement of furniture. Regardless of the reason, appropriate furniture placement has the potential to allow a resident limited control over personal environments (pp. 122, 124 herein).

New environments   A category of intervention not used in the case study facilities can be referred to as the inclusion of newly built environments. These environments consist of:

1. designated wandering areas,

2. activity areas occurring at opposite ends of a corridor,

3. larger resident's rooms and bathrooms,

4. multi-purpose activity pockets located along the corridor periphery, and

5. an entirely new wing designed distinctive for all persons associated with AD.

This category of intervention is the least likely to be instituted in existing long-term care facilities, due, in part, to the obvious increase of economic input required. A higher caliber of potentially positive design interventions will be difficult to establish in a general context until user needs are more widely appreciated.

Organizational Policies vs. the Physical Environment

Nursing care facilities are necessary. They can and should be designed to incorporate more of a residential atmosphere. This means that not only should the physical environment support a residential form of care, but also the social environment should be included. The author

found that although certain physical environments displayed a comfortable atmosphere, the social and organizational policies of the facilities did not. Goals for the care of AD residents are in existence. However, they are too general. Administrators should become more aware that organizational policies must be altered in order to provide a more therapeutic environment for their residents. Allowing staff members the opportunity to adapt surroundings to everyday happenings provides a sense of autonomy in care methods, job satisfaction, and levels of stimulation for the resident (Gwyther, 1985).

The administrators of two case studies recognized that support groups are a necessary part of the therapeutic method of caring for AD residents. One facility maintained a support group for staff members, one for families, and one for both. This type of unity can raise the awareness of the administration to the needs of staff and family members of the residents (two important user groups).

The author believes that no organizational policy from the case studies is "innovative." None have a clear understanding or overall concept of a therapeutic environment. Information gained from the case studies on learning or attention span of AD residents was inconsistent with current literature. Staff members interviewed had little realization of the physical environment's potential

for having an impact on the behavior of residents and staff. There are those who believe good staff members can overcome a bad environment. Others believe that AD residents are too far gone to realize what is going on around them. However, there is evidence suggesting the low-competent are the group most sensitive to the physical environment (Lawton, 1981). It is clear that the hierarchy in policies must be changed in order to achieve progress in the design of the physical environment. Two possible procedures may be instrumental in gaining policy changes. One procedure depends upon consumer demand and the other upon governmental intervention. Both are discussed in Future Implications.

Future Implications

According to a joint resolution from the 99th Congress, Alzheimer's disease is responsible for 50 percent of all nursing home admissions, at an annual cost of more than $20,000,000,000 (Gwyther, 1985). However, with respect to the increasing costs of medical and nursing home care, facilities are finding it increasingly difficult to justify spending money to enhance the physical environment. However, short-term costs should be weighed against long-term benefits. Alternatives discussed by case study interviewees demonstrate that a design solution may be a retrofit as opposed to a newly

built environment (pp. 99-101 herein). Regulations
regarding the use of space, standardization and repetitive
uses of fixtures and furnishings, and the organization of
building parts may be varied in order to support the staff
members' efforts to care for the AD residents. Reported
through schematic design suggestions, variations in the
environment can be introduced through the use of furnishing
types, color schemes, and individual treatment of personal
space. Many useful design alterations cost little, and can
be done within limited time constraints.

Hospital care

To date, no health care system in the postindustrial
time has seen as much structural change as hospitals.
What once was a cottage industry populated by thousands of
freestanding, largely nonprofit hospitals has changed into
a system of alliances and networks. Investor-owned systems
have steadily grown through the 1970s and the early 1980s.
There are many advantages to investor-owned systems, such
as the ability to innovate, to obtain more favorable
managed care contracts, and to increase political clout
(Shortell, 1988, p. 183). All of the above contribute to
generating value to the customer in local markets.
Investor-owned systems encourage hospitals to be keenly
aware of an increasingly well-informed, demanding public.
The net result is that hospitals are accountable for both

cost and quality, and will have to demonstrate to the stockholders how well they are doing. In other words, hospitals will have to "sell" their systems of care as a point that differentiates them from their competitors.

The 1980s revolution in hospital care is matched by a similar revolution in architecture. Gone is the antiseptic white-on-white look. Due to the "new obsession with consumer comfort," the "technocrat" of design is being replaced by the "design" architect (Davis and Greenberg, 1986, p. 63). An example of an enhanced environment that provides for long-term cost benefits is demonstrated through the retrofitting of hospital maternity wards and the introduction of the "birthing room." Competition of available hospital space has led individual hospitals to compete for patients giving birth. A marketing approach is commonly used to determine what customers want and then establish a method to give it to them vis-a-vis the "birthing room," more domestic in appearance and thus, provide hospitals an edge over the competition.

Nursing home care

The future of nursing home care may rely on similar circumstances to that of hospital care. It is anticipated that the number of residents will increase from 1.5 million to 5.2 million by the year 2040 (Fowles, 1987). It is reasonable to assume, based on the demographic shift,

there will be a demand for new approaches to designing care facilities for the elderly. Economic competition will once again prove to be the decisive element in providing variety in quality care. However, the "baby boom" generation may not be the beneficiaries of this quality in care. With an increase in the elderly population there will be an increase in long term care facilities. Yet it will not be a "buyers market" until after the "baby boom" generation has passed. The next generation that has a smaller population (those who are about 10 years old now) growing older will reap the benefit of having a surplus of facilities to choose from.

Currently, to bring about change in the health care environment, where legal and technical restrictions abound, the installation of government regulations would be another route towards progress. An example of how government regulations encourage change is demonstrated through the energy budget. A segment of the budget requires office buildings to have 1.5 watts per square foot of lighting. Building owners must demonstrate or prove they have complied with the regulations. Thus, change is brought about for the benefit of the workforce. In a similar manner, special government health care packages could initiate standards and codes for the design of special care wings for persons with AD.

Potential for the designed environment

There is, of course, a great potential for the physical environment to go way beyond the interventions now in place. The "cutting edge" has yet to be seen in the design of long-term care facilities. Full use should be made of all environmental opportunities. However, the current movement in intervention may be gravitating to different delivery systems.

Currently, day-care programs are emerging as an alternative for households who, for various reasons, do not view long-term nursing care facilities as a viable option. The systems at these facilities operate similar to systems already in place for child day-care.

Another form of intervention is therapeutic group sessions. These groups help make all types of caregivers aware of each other's needs and also of current trends in therapy. A variety of programming techniques that provide for the training of staff by family caregivers, experienced aides, and other experts appears to be an increasing form of intervention. An expanding understanding and acknowledgment of the suffering that all AD victims (members of the household and staff included) go through, leaves no doubt that interventions will come in many forms. Therefore, no single measure of intervention will successfully operate without the reinforcing aspects

of another. A demanding population that is aging and increasing in number leaves no doubt that designers will turn to alternative solutions that dignify rather than reproach suffering.

Summary

A designer should be aware that the extent of the physical environment goes beyond acceptable decor and "tastefully" furnished dining rooms and lounge areas. For example, although Hickory Park Nursing Care Facility has a very attractive appearance, components of the physical environment are not enough of an intervention for persons having orientation problems (pp. 74, 85-86 herein). While the improvement through appearance will be satisfactory to those who remember the days of asylums, material changes should not hide the fact that only a domestic appearance has been created. Actual elements which constitute intervention, e.g., autonomy, personalization, orientation, etc. may have been disregarded.

As a result of the interviews and observations conducted as part of the case studies it has become evident that the best solution is not just an environmental one. The physical environment is not solely responsible for the therapeutic interventions required to bring about a change in the conditions of AD residents and staff members.

Intervention that is brought about through the properly designed environment will not be of full benefit unless administration is willing to participate. This is occurring on a limited basis at Summerville Manor. Staff members are allowed by the administrators to use trial and error methods in determining appropriate care for each AD resident. Therefore, opportunity for more interaction among the resident, the staff member, and the physical environment can occur. The input from progressive staff members and the intervention that comes from a better-educated administration is an area that should be developed. The ideal situation occurs when a properly designed environment and the operational philosophy of the administration works together and produces therapeutic interventions.

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