APPLICATION OF HORTICULTURE AS A MEANS OF THERAPY

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Reva Doris Zischke

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APPLICATION OF HORTICULTURE AS A MEANS OF THERAPY

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Reva Doris Zischke

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I. INTRODUCTION

Horticulture has been used in the treatment of illness for many years. Recently, great interest has developed in this treatment medium largely through the activities of garden club members. Although many informative articles and a handbook have been written, no comprehensive study of this type of treatment has been located.

Horticultural Therapy is the use of plants or plant materials for the improvement of mental or physical health. Horticulture, as considered here, refers not only to gardening procedures, but also to any activity involving plants or plant materials, or other projects closely related to indoor or outdoor gardening. Therapy, in a strict sense, is any prescribed treatment which cures or relieves illiness. Here, however, therapy refers not only to that treatment which cures illness, but also treatment which helps to maintain health. Since Occupational Therapy is, by definition, any activity, medically prescribed, and administered by trained therapists; Horticultural Therapy may well be considered merely form of Occupational Therapy.

The purpose of the present study is to investigate the possibilities of horticulture as a therapy, and to outline a suggested program for Occupational Therapists based on the observations made during a pilot study and on reports of authorities who have in the past recommended or observed the use of horticulture in the treatment of the sick.

The pilot study was planned to include, in a twelve week program, the following: gardening, plant identification, plant propagation, elementary plant science, flower arrangement, and related short term projects.

No attempt has been made to set up this program as a controlled experiment.

II. SIGNIFICANCE OF HORTICULTURAL THERAPY

Horticulture can be an important part of any Occupational Therapy program. Its value is significant because it can add a breadth of opportunity, a variety of treatments for many types of disabilities, and choice of horticultural activities which may be selected or adapted as part of the treatment program.

Values of Horticultural Therapy

The primary value of Horticultural Therapy is not as a new and distinct therapy to supercede other therapies, but as one form of activity which has been used along with many others in the treatment of illness. The purpose of Horticultural Therapy is the improvement of mental or physical health. Many authorities have recorded benefits to patients and to institutions through the use of horticulture. Patients, also, testify to the help they have received from engaging in horticulture.

Relation to Occupational Therapy: The use of horticultural skills as a therapy is considered merely one form of therapeutic activity for the following reasons: from the earliest records to the present time, references to the use of occupation in the treatment of illness mention gardening as one of the activities so used; and horticultural activities adequately meet the requirements of activities having therapeutic value.

In 1798 Benjamin Rush wrote to the Board of Managers of Pennsylvania Hospital that spinning thread, sewing, and churning butter might be contrived for the women. Turning a wheel, particularly in grinding Indian corn in a hand mill for food for the horses and cows of the hospital, cutting straw, weaving, digging in the garden, sawing or planing boards were recommended for the men (Packard, 1931).

Edgerton in 1947, listed characteristics of activities having therapeutic value. It is apparent from the following list--adaptability to patient's working position, adaptability to patient's physical needs, variability, freedom from dangers and annoyances, appeal, stimulation of creative expression on the part of the patient, suitability to budget and space allowance, further application--that there are few activities of a horticultural nature which would not adequately suffice the requirements of the Occupational Therapist.

In 1845, in A Sketch of the History, Buildings, and Organization of the Pennsylvania Hospital for the Insane, Thomas S. Kirkbride indicated that outdoor labor in the gardens and on the grounds or on farms was one of the many means of moral treatment. It was mentioned by William Rush Dunton, Jr. (1915) that many hospitals had a part of their grounds which was identified as patients' gardens. Flowers were grown to beautify the wards and rooms, and vegetables were used to add to the menu and raised with much enjoyment. He mentioned that a few seeds in a pot of soil is a good beginning, and that rose petals might be used in a "sweet jar", for rose syrup, candied rose petals, sandwiches, and lozenges. In fact, he referred to recipes compiled by Henrietta D. Gramel and Caroline B. King and listed in the "Woman's Home Companion" for June of 1913.

In 1925, Anne E. Perkins mentioned that one of the best avenues of escape from work and worry was to cultivate an interest in the out-of-doors and to study at least one branch of nature. She mentioned ferns and flowers and suggested that it was important to use whatever was at hand, emphasizing the importance of observation and intelligent enjoyment of horticultural activities.

Nora A. Haworth and E. Mary MacDonald (1946) emphasized that during the latter half of the 18th century, there are many records of occupation being used as a form of treatment. That they also referred to the work of Doctor Rush in 1798 is further evidence of the forms of horticulture which have been used in Occupational Therapy.

Purpose of Horticultural Therapy: The purpose of Horticultural Therapy has been the improvement of mental and physical health. This has implied aiding in recovery from illness, and it might include vocational rehabilitation and prevention of illness by promotion of general well being.

Many medical doctors have recognized the value or prescribed the use of horticultural activities (Francis, 1887; Dunton, 1917; Hamilton, 1942; Licht, 1944; Wright, 1945).

Prescribing Horticultural Therapy for a patient depended on the possibility of benefit to the patient. Daniel H. Trezevant (Amer. Jour. Insanity 1845), recognizing the value of the custom of keeping patients employed at some trade or on the farms, recommended that they be forced to work or "engage in amusements" if this would benefit the patients. He pointed out that the welfare of the patient and not the profit to the institution should be a deciding factor.

An important aim of therapy is to help the patient adjust to hospitalization. It was believed that Horticultural Therapy could help the patient relax and be in a more receptive attitude toward treatment. (Jonas, 1955).

An effective Horticultural Therapy program depended on making the most of facilities available, meeting the need of the patient, and following the prescribed medical program (Watson and Tukey, 1954).

Benefits of Horticultural Therapy: Benefits have been demonstrated by many authorities.

As long ago as 1887 Lloyd Francis recognized that outdoor employment helped combat sleeplessness, improved the appetite, and provided opportunity for mental patients to relieve angry feelings by viciously digging in the earth instead of attacking attendants.

William Rush Dunton, Jr. (1917) inferred that employment of patients in gardens and other activities connected with maintenance of Bethlehem Hospital diminished the need for restraints. W. E. Shewell-Cooper (1938) stated that gardening helped train character by helping the impatient to become patient and the careless to become more meticulous.

Growing and propagating plants satisfied the self-preservative and procreative instincts. Gardening increased muscle strength and gave self satisfaction that came with success and an opportunity to follow the routine of the seasons. This was of value because it made the individual feel in accord with nature (Hamilton, 1942).

Sidney Licht (1944) said that gardening strengthened muscles and provided mental relaxation. Sunshine, fresh air, satisfaction of parental instinct, opportunities for discovering and sharing, and opportunities for learning coordination are listed by Drs. Dunton and Licht (1950) as advantages offered by gardening.

Maureen Mahar (1953) believed that garden therapy relieved tension, developed reassurance, and provided a new source of absorbing interest.

One of the benefits was improved morale of the patients. Roland H. Berg (1955) commented that there had been no attempts among the criminally insane to escape from the gardens at St. Elizabeth's Hospital in Washington, D. C.

Genevieve Jonas (1955) considered Horticultural Therapy to be valuable in helping a tubercular patient regain work tolerance. She stated that it could be used in diagnosis. As an example she mentioned the indication of incoordination by the irregular path of a lawn mower pushed by a neurological patient. She claimed that Horticultural Therapy had helped blind, mentally ill, tubercular, heart, polio, crippled, and geriatric patients.

Another evidence of improved morale was a poem quoted by Eleanor Clark Slagle (1914) in which a patient wrote of hoeing and spading as "healthful labors."

The work of patients can be of economic value to an institution. The Thirteenth Annual Report of the New York State Commission in Lunacy (1903) stated that the proportion of patients employed in maintenance had increased to the extent that the labor had actual monetary value.

Richardson Wright (1945) was very wise with his warning that to engage in horticulture is not a cure-all. He offered the advice that help should be given those who are exploring this field, but others should proceed cautiously.

Testimonials: Many whose health has been improved by working in the garden are willing to testify to that fact.

Gertrude Schenck (1911) described her personal experiences in gardening and stated that this helped her regain her health.

"The Garden Doctor," (1913) which was published anonymously as a serial story told of a young woman whose interest was aroused by watching her neighbor prune his roses. From this beginning her interest grew until she conceived the idea of working in her own garden. Gradually, as she worked under her nurse's direction she regained strength and health after having been mentally ill for two or three years.

A slightly different approach is that of Montrose Moses (1933) who described how an invalid guest taught her host and hostess to appreciate their garden.

Laura Gaye (1953) stated that the hobby of gardening, as suggested by her doctor, pulled her out of a "neurotic coma".

Gardening was recommended by C. E. Bayless (1955) for indivicuals who had impaired hearts. This author cited personal experience as proof of its value and emphasized that the amount of exercise could be suited to the individual need.

Scope of Opportunity

Horticulture has been used for: hospital patients, vocational rehabilitation, school children, prisoners, and as a form of leisure for many years.

Hospitals: For many years individuals concerned with organization and management of hospitals have advocated maintaing a garden both as a source of fruit and vegetables and a recreation area for patients.

In 1792 a meeting of the Society of Friends was held at York to consider building a habitation for those of their number who were "in a state of lunacy." One of the stipulations was that the site be designed to include a few acres for cows and a garden. At the time this description was written the garden furnished an abundance of fruit and vegetables as well as a place of recreation and employment of many patients (Tuke, 1813).

The visiting committee of the board of the Society of the New York Hospital reported on December 1, 1821, that female patients were employed in spinning, sewing, and knitting, but the only occupation found for male patients was work on the farm or in the garden. In 1882 it was resolved

that a man be provided to supervise male patients who were able to assist on farm and grounds and to see that they were employed in a manner consistent with the plan of moral treatment (Haas, 1924).

Benjamin Rush (1830) noted that maniacs who assisted in cutting wood, gardening, and other tasks connected with maintenance of the hospitals often recovered while those whose rank exempted them from labor did not recover.

Susan Tracy (1912) recommended indoor gardening as a bedside occupation. She suggested planning a garden, caring for window boxes, growing seedlings, and propagating plants.

At Nopeming Sanatorium in Minnesota outdoor hobbies were encouraged (Laird, 1917).

Louis J. Haas (1924) reported that gardening proved so valuable for the patients, both male and female, that in 1917 an instructor in gardening was added to the women's department.

In the 1920's the administration of Kankakee State Hospital provided opportunities to engage in basketry, horticulture, agriculture, calisthenics, games, sight seeing trips, and moving pictures for patients in the closed wards. These activities were administered under the guidance of a reconstruction aide (Pratt, 1922).

William A. Scott in 1923 reported that at Kalamazoo State Hospital many of the patients were provided with their own small gardens during the garden season. Vegetables that did not have to be cooked and flowers were grown; a prize was given to the patient who had the best garden.

Hartwell (1933) reported that landscape gardening had been used for several years at Edward Hines Jr. Veteran's Administration Hospital at

Hines, Illinois. The work was done in greenhouses and a half-mile of landscaped gardens, borders, and lawns. The hospital garden club became a member of the Federation of Garden Clubs of Illinois in September, 1930.

Watson and Tukey (1953) described several Horticultural Therapy projects suitable for use in a hospital and emphasized the importance of planning the project to suit the probable length of illness.

In 1955 a handbook was published to help volunteers interested in Horticultural Therapy to use their time most effectively. It pointed out the need for more volunteer workers and stressed the importance of working under medical supervision and in cooperation with the hospital staff (Jonas, 1955).

Vocational rehabilitation: During World War I gardening was recommended for the reeducation of disabled soldiers. The curative value of the work was demonstrated in European hospitals and reconstruction centers. It was observed that those who were taught gardening and field work made more rapid recoveries than others. One of the reasons for the therapeutic value was the emphasis on creation rather than destruction, a more recent association of soldiers (Harris, 1918).

Walter Campbell (1919) recommended the training of injured soldiers to become head gardeners on large estates.

During this period the Federal Board for Vocational Education offered courses in gardening for disabled soldiers and suggested that the continuation of garden work, which aided in recovery, would help maintain health. Using the same reasoning, the Red Cross established truck gardens near hospitals for wounded soldiers. This proved beneficial physically and psychologically (U.S. Federal...Education, 1920).

School Gardens: Gardening has been found stimulating for children. W. A. Baldwin (1906), principal of State Normal School, Hyannis, Massachusetts, described their work in school gardens. He stated that the pupils showed less nervous tension, more freedom, more personal responsibility, more earnestness, and greater loyalty to the school as a result of this programme. He suggested that gardening could be coordinated with other subjects such as business arithmetic, lessons in plants and animals, sociology, and ethics but advised the teachers to refrain from gardening programs until they thoroughly believed in them.

Harlan Smith (1916) reported that the system of school gardening as used in Portland, Oregon, proved valuable not only in terms of monetary returns, but also in knowledge, health and happiness.

A garden project in East Side New York City provided valuable recreation and experience for children (Sorden, 1924). It was such a popular project that more children applied for gardens than could be accomodated. Crippled children were brought one afternoon a week to work in the gardens. These children were helped by other children who were not handicapped. The annual cash value of the vegetables and flowers grown in this project was reported to be $6,000.

A rather extensive garden program is operated in the greater Cleveland Area for the school children (Young, 1955).

Prisons: Prison officials, too, have found gardening beneficial. Vegetable gardens were planted at San Quentin Prison during World War I for production of food. An amazing change was noted in the mental attitude of many prisoners; there were more applications for help than there were vacancies. After the war, when food production was no longer vital,

vegetable gardening was abandoned, and the area was used to create a beautiful garden (Garden Magazine, 1921).

Ira J. Mills, Director of Agricultural Education, Eastern State Penitentiary, Graterford, Pennsylvania (1942) reported that one of the subjects taught was landscape gardening. Two factors were kept in mind. Custody was foremost but the object to create rather than eliminate work was emphasized. He even complained because his work was hampered by the lack of landscape gardeners among the prisoners. An important aspect was Occupational Therapy for individuals with poor health or physical defects, and those on the verge of mental disorders. The value was attributed to close association with the soil and flowers, personal supervision, and continuous activity.

Leisure: Gardening has long been considered a suitable activity for leisure time. Benjamin Rush (1789) in a lecture for medical students recommended that those who intended to serve rural areas establish themselves on small farms. He suggested that the principal attention be directed to grass and horticulture because these afforded the most amusement, required only moderate labor, and would interfere the least with the practice of medicine.

After the eight hour day was established in France, measures were taken to provide means for workers to spend their leisure time profitably since it was believed that idleness would be injurious to their health and lives. Labor inspectors were asked to report instances in which employers had taken the initiative in providing gardens for their employees. Some of the projects reported were houses with gardens, garden plots near factories, prizes for keeping gardens in order, and gardens for fathers

of the largest families (International Review of Agricultural Economics, 1921).

It was believed that Horticultural Therapy could ease the tension of daily living and thus become preventive medicine (M.S.C. Leaflet, 1954).

Types of Disabilities

Mental Illness: During the nineteenth century, progress in the treatment of mental illness was characterized by humane treatment and provision for activity. Planting gardens and farms, harvesting crops, spading flower beds, mowing the lawn, repairing roads, helping erect new buildings, and helping in the greenhouse are listed as activities that proved beneficial to certain classes of the insane (Wagner, 1903).

The use of horticultural activity has been endorsed by many authorities. In 1822, Dr. Wyman, Superintendent of McLean Hospital in Waverly, Massachusetts, included gardening as one of the amusements that afforded exercise for the body and the mind (Slagle and Robeson, 1941). William Rush Dunton, Jr. (1917) mentioned the opportunity for patients in the garden at Bethlehem Hospital as long ago as 1840. Dr. Yellowlees of Glamorgan County Lunatic Asylum reported in 1867 that nothing was so conducive to physical and mental health as occupation and that great effort was made to find employment for all who were capable of it. He said that the men worked in gardens and fields or with tailors, masons, or blacksmiths.

After visiting several of the principal hospitals for the insane in Europe, Isaac Ray (1846) reported that agriculture was a favorite kind of employment. At Gloucester, patients were allotted a plot of ground where they were permitted to grow vegetables for their own table.

Lloyd Francis (1887) indicated that in private hospitals the use of gardening and farming as a treatment, although beneficial, often presented a problem because the patients resented being asked to work. In public institutions, however, pauper patients could usually be induced to work by being given some small luxury, but it was not easy with patients in private hospitals. Relatives, rather than the patients, often raised objections, but once the patient did some gardening he seldom objected again. Three cases were cited (hypochondriacal melancholia, mania, and acute mania--secondary dementia) in which complete recovery rapidly followed steady application to outdoor work. Patients with chronic insanity responded favorably although not always with complete recovery.

Gardening was claimed as a cure for mental breakdowns. In fact, Bolton Hall (c. 1910) describes three cases in which cultivation of a small plot of ground proved valuable in cases of melancholia. He even stated that gardening was considered to be almost as specific a treatment as had been discovered at that time.

Some of the appreciative as well as the most skilled workers at King's Park Hospital in New York in 1912, were male patients employed out-of-doors. They lived in an open door cottage, had the parole of the grounds and received fifty cents allowance per week. This group composed a superior class based solely on conduct; the fact that this privilege had not been abused indicated how highly the patients had valued the treatment (Haviland, 1912).

Robert Carroll, in a paper read before the Tri State Medical Society in Richmond, Virginia in 1910, discussed the therapy of work in the treatment of neuroses. In three of the five cases which he cited to prove the value of work— not mere passive diversion—gardening played a vital part in

the patients' recoveries.

It was recommended that mental patients who had led a life of pleasure might be prescribed the opposite form of occupation and that at least part of their time should be spent in the open. Work in flower or vegetable gardens was highly recommended (Clark, 1917).

Roy. A. Morter (Jonas, 1955), Medical Superintendent of Kalamazoo State Hospital, believed that gardening, flower arranging, and competitive exhibiting of garden prodjects would help mental patients sublimate useless drives into channels of social and spiritual value.

Tuberculosis: Gardening has gained recognition much more slowly as a treatment medium for tuberculosis than for mental illness. In 1917, Arthur Laird, without evaluating its success, reported gardening as one of the activities carried on by convalescent patients at Nopeming Sanatorium in Minnesota.

T. B. Kidner reported in 1922, that attempts had been made to provide outdoor work for therapeutic purposes but that there had been few examples of success. Floriculture and gardening were included in a list of activities suited for patients who have reached the stage in their recovery where more strenuous activity was indicated. Market gardening was suggested as a satisfactory field for farmers who have recovered from tuberculosis (Townsend, 1927).

Mary Lydia Rowe and Ernest S. Mariette (1928) recommended lighter phases of farm work such as poultry raising, bee culture, floriculture, and tree surgery for ex-patients. They suggested that the theoretical phase of these occupations could be taught while the patient was in bed, and the practical aspect learned after the patient was well enough to use some exercise.

Handicapped: A program of garden therapy was set up at Camp Kilmer in New Jersey for both functional and psychiatric treatment. The patients were assigned by medical prescription and the work was supervised by Mrs. Stephen G. Van Hoesen (Flower Grower, 1945).

John H. C. Colson (1944) devoted one section of his book, The Rehabilitation of the Injured, to a discussion and analysis of gardening procedures as means of treating physical injuries.

In the case of the physically handicapped, hoeing and raking were considered good for strengthening muscles of disabled arms, and the use of small, self-propelled lawn mowers was suggested for exercise of the legs (Tukey and Watson, 1953).

Some of the reasons listed by Mildred Ibach (1955) that garden therapy can be adapted to the physically handicapped were the following: perfect use of the hands is not compulsory for planting; complete vision is not needed to keep planter boxes well watered; good hearing is not essential to enjoy planting, potting, and caring for tender plants in a greenhouse.

Blind: One of the first gardens for the blind in this country was started in 1949 at John J. Tyler Arboretum at Lima, Pennsylvania (Strong, 1955). Volunteer help was given by many organizations and individuals. The garden is on a slope where borders may be planted waist high. Plants were selected for fragrance or flavor, hardiness, and ease of maintenance; and labelled in Braille. Since then gardens for the blind have been started in other parts of the United States.

Growing herbs was recommended for blind patients by H. B. Tukey and Donald P. Watson (1953). They recommended an outdoor herb garden as ideal, but suggest growing herbs in pots indoors where this was not feasible.

The Georgia Academy for the Blind located in Macon, Georgia, built a greenhouse and started a vocational program in horticulture. Objectives of the program were: to develop methods for instructing the blind in greenhouse production and operation; to devise means by which the blind might achieve the same objectives as those who see; to set up a course of training for those over sixteen; to furnish information on new methods of instruction; and to stimulate expansion of employment opportunities for the blind (Southern Florist and Nurseryman, 1955).

Cardiac: During a pilot study on various aspects of the total care of the rheumatic and cardiac child conducted at Bellevue Hospital, growing seeds and caring for plants were among the Occupational Therapy activities in which the children participated. The educational values of this type of project was stressed (Yasumura and Baldwin, 1953).

C. E. Bayless (1955) offered the following interesting suggestions for people who are interested in gardening, but whose hearts do not permit stremuous activity: don't grow vegetables; sit while working; don't do heavy digging with spade or fork; and stop at the first feeling of fatigue.

Types of Activities

Agriculture: In 1845, the American Journal of Insanity recommended at least one hundred acres for each institution so the patients would have an area for labor, exercise, and amusement where they would not be bothered by intruders.

Isaac Ray (1846) reported that many of the hospitals in Europe operated farms: Glasgow Asylum, 57 acres; Surrey, 97 acres; Bicetre, 30 or 40 acres; Illenau, 55 acres. He reported frequent complaints that this was not enough land.

The manager of the Pennsylvania Hospital acquired possession of a tract of land in 1889, then later obtained several other farms. A group of patients was sent to live at one of the farm houses; the colony was changed occasionally. In addition, other patients were taken to the farm to spend the day. It was noted that a large number of these patients began and continued to recover (Morton, 1895).

Bolton Hall (b, 1910) commented that farming in connection with institutions was not new, but he expressed amazement that it was not used more universally.

Outdoor Gardening: Gardening was found to be beneficial for tubercular children by John Winters Brannan. Gentle work, fresh air, sunshine, and interest were considered important factors. J. McKee Borden, secretary of Public Charities of New York, approved the use of school gardens and stated that gardens for normal, crippled, feebleminded, and epileptic children had been increased. Gardening was found so useful in arousing interest among patients in the Northampton State Hospital for Women that more extensive plans were made for the future. It was reported that the Western House of Refuge, Albion, New York, needed women trained in agriculture to direct the garden work of the girls (Hall, b, 1910).

Bolton Hall (a, 1910) believed that children who were accustomed to healthful outdoor occupation as well as play were more likely to become useful, healthy, and happy adults. He inferred that outdoor occupation would be especially good for tubercular patients and suggested that each inmate should have an individual garden plot.

Many of the steps in gardening such as preparation of the ground, irrigation, and ditching could not be done by a sick individual; the

patients might have to begin by picking flowers (Barton, 1919).

John Ivison Russell (1938) contrasted ordinary garden work, where patients were expected to show results under the direction of supervisors, with special parties consisting mainly of dull schizophrenic patients who were not able to work in the regular groups. He concluded that the duty of directing these groups was much more exacting than regular garden work and pointed out the following difficulties: desiring to do the job oneself, attempting a job that was in part too difficult for the patients, working with valuable material, agreeing to adhere to a work schedule upon which another group depended. He recommended that authority should be sufficiently decentralized so that nurses could use their discretion in planning the work for each group.

The following advantages of gardening were listed by John Colson (1944): outdoor work, minimum facilities, inexpensive equipment, productive work, and work that is familiar to most patients. He mentioned the following disadvantages: the seasonal restriction, limitation of facilities in every garden, and dependence upon the weather.

Ruth Mosher Place (1948) reported that the possibilities of Horticultural Therapy had been tentatively explored in rehabilitation programs for disabled veterans.

Greenhouse gardening: Gardening in a sun-heated pit as carried on at Cushing General Hospital was described by Kathryn S. Taylor (1945). She recommended that type of greenhouse in preference to a regular greenhouse. She believed that working with the flowers was valuable in the struggle back to health.

Bedside gardening: Gardening was suggested by Susan Tracy (1912)

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as one of the activities suitable for bed patients. Cornelia Stratton Parker (1952) and Maryelle Dodds (1953) each described simple projects with plants for children who must remain in bed for long periods.

Landscape appreciation: Isaac Ray (1846) was favorably impressed with the beautifully landscaped grounds of many European hospitals for the insane and commented that these beautiful surroundings were capable of arresting the attention of the violent and excited, diverting the melancholic, and furnishing occupation and delight to the convalescent. He recommended that selection of a hospital site should be based not only on the prospect it afforded, but also on its possibilities for landscape gardening. Carl F. Pilat (1924) summed up the therapeutic values in the statement that pleasant surroundings were more important than pills in the treatment of tuberculosis.

III. DEVELOPMENT OF HORTICULTURAL THERAPY

In the Early Period

Egyptian temples dedicated to Saturn were early examples of the use of gardens for the treatment of illness. These temples were surrounded by beautiful groves and gardens. Boating, concerts, and other amusements were provided for the diversion of the ill (Pratt, 1922; Slagle, 1941).

The Aesculapian temples at Epidaurus were famous for their "cures". These temples, also, were surrounded by groves and located so that there was a beautiful view in every direction. The beautiful surroundings and pure mountain air contributed to many recoveries (Ball, 1924).

In the Eighteenth and Nineteenth Century

Little more evidence of the use of horticulture as a therapy was noted until the latter half of the eighteenth century. At a time considered to be the beginning of modern psychiatry, physicians began emphasizing "moral treatment" of mental patients instead of imprisonment and treatment by purely physical methods. This "moral" management consisted essentially in treating the mentally ill as human beings, releasing them from chains, placing on them as much responsibility as they could carry, and providing them with diversional activity (Pinel, 1806; Deutsch, 1938; Clendening, 1942).

The value of the use of activity in the treatment of the ill was discovered somewhat by accident. It became customary for the poorer patients to be forced to work in the hospitals. Growing fruit and vegetables for use in the institutions and keeping of cows and horses were vital phases of maintaining the hospital. Consequently gardening and other

agricultural work were among the first tasks to which patients able to work were assigned. It was noted rather universally that these poorer inmates frequently recovered while the idle rich remained ill (Rush, 1830).

Pinel (1806) mentioned specifically a hospital in Saragossa, Spain, where agriculture and horticulture proved beneficial to patients.

Gardening was considered sufficiently important that in 1792, when the Society of Friends planned The Retreat, a hospital near York for the mentally ill, it was thought necessary to procure a site where there would be a few acres for cows and a garden.

Benjamin Rush, in 1798, was sufficiently convinced of the therapeutic value of work that he recommended that effort be made to find employment for as many patients as were able to work. One of the activities he suggested was digging in the garden (Morton, 1895; Packard, 1931; Haworth and MacDonald, 1946).

By 1845, the practice of keeping patients employed at some trade or on the farms was apparently widespread. The value of the exercise and diversion that kept the patients from dwelling on their troubles was so apparent to Daniel Trezevant (American Journal of Insanity, 1845) that he recommended forcing patients to work although he did not state how this was to be done.

Outdoor labor in the garden, on the grounds or farm was reported as one of the many means of "moral treatment" used at the Pennsylvania Hospital (Kirkbride, 1845; Morton, 1895). There are reports of similar activities being used during this period at McLean Hospital, Bethlehem Hospital, and Glamorgan County Lunatic Asylum (Dunton, 1917).

The importance of a suitable location for a hospital was pointed out

in the American Journal of Insanity for 1845. A farm area and pleasant surroundings where the patients would be shielded from intruders were considered vital.

In 1846, Isaac Ray reported that during his recent tour of several mental hospitals in Europe he had observed that agricultural labor was a favorite kind of employment and complained that patients in America would not work without pay. He, too, pointed out the necessity of selecting a suitable site for an institution so that the grounds could be made attractive.

Dr. Dunton, (1917), inferred that during the period from 1860-1890, many hospital superintendents and physicians stressed the economic value of work above its therapeutic application.

During the nineteenth century most of the activities were necessary jobs connected with maintenance of the institutions (Wagner, 1903; American Journal of Insanity, 1903).

In the Twentieth Century

During the early part of the twentieth century, gardening and other activities were being used in a variety of institutions. W. A. Baldwin, principal of State Normal School, Hyannis, Massachusetts (1906), and Harlan D. Smith of Portland, Oregon, (1906) both reported favorable results from the use of gardening activities in connection with schools.

Gardening was found beneficial in tuberculosis hospitals, an orphan asylum, and a women's reformitory (Hall, a, b, 1910; Laird, 1917).

Discussions of the therapeutic value of work in the treatment of the mentally ill written during this period continued to list gardening

as one of the valuable activities (Hall, c, 1910; Carroll, 1910; Haviland, 1912; Clark, 1917). Bolton Hall (c, 1910) and Robert S. Carroll (1910) both describe case histories in which gardening and other outdoor work was valuable in promoting recovery.

By this time, activity as an aid in the treatment of disease had gained sufficient approval that effort was made to devise occupations apart from maintenance of the institution. We have evidence of this in the publications: Studies in Invalid Occupations by Susan E. Tracy (1912), Occupation Therapy by William Rush Dunton Jr. (1918), and Teaching the Sick by George Edward Barton (1919). All three of these books recommend gardening as one of the activities that may be used.

It is interesting to note that in 1917 an instructor in gardening was added to the women's Occupational Therapy department in Bloomingdale Hospital located in White Plains, New York (Haas 1924).

During and immediately following World War I, gardening was used in the treatment and reeducation of disabled soldiers. The primary emphasis appears to have been diversional and psychiatric rather than functional (Harris, 1918; Campbell, 1919; U.S. Federal Board for Vocational Education, 1920).

Several of the articles and books about Occupational Therapy which were written during the period from 1920 to 1940 mentioned gardening with varying degrees of emphasis (Scott, 1923; Haas, 1924; Perkins, 1925; Rowe and Mariette, 1928; Hartwell, 1933; Russell, 1938).

Beginning about 1940 there were increasing instances where "garden therapy" was discussed as a separate type of treatment (Hamilton, 1942; Mills, 1942; Taylor, 1945). Richard Wright (1945) used the word "horto-therapy," and Ruth Mosher Place (1948) called it "horticultural therapy."

During the second World War gardening was used as treatment for injured soldiers with apparently much greater emphasis on functional treatment than was evident during World War I (Licht, 1944; Flower Grower, 1945). All of these refer primarily to outdoor gardening or greenhouse gardening.

Investigations into the potentialities of the use of horticulture as a therapy were begun in the Department of Horticulture at Michigan State College in 1951. A series of workshops for interested therapists, nurses, and horticulturists was followed by testing procedures, demonstrations, and distribution of information (M·S·C. Leaflet, 1954).

About this time much of the impetus and activity for the work in Horticultural Therapy was the result of vigorous activity on the part of many garden club members in the United States (Ibach, 1956).

Carl Menninger (Jonas, 1955) strongly favored training individuals in Horticultural Therapy since this is one type of adjunctive therapy which brings the individual close to the soil, to beauty, and to the mystery of growth and development.

Other phases of horticulture such as floriculture, plant propagation, and plant physiology were stressed during the early 1950's. There was increasing effort made to devise horticultural projects suitable for use indoors and for bed patients (Horticulture, 1953; Watson and Tukey, 1953; Ibach, 1955; Jonas, 1955).

A comparatively recent development was the emphasis on gardens for the blind as teaching devices, possible vocations, and recreation (Strong, 1955; Ibach, 1955).

IV. PRELIMINARY TESTS AT KALAMAZOO STATE HOSPITAL

Introduction

In order to serve as a pilot study, an exploratory program of Horticultural Therapy was conducted at Kalamazoo State Hospital during July and August of 1955.

Specific horticultural skills were taught to a selected group of eight mental patients. Previously, except for a few years during the early 1920's, little closely supervised gardening was conducted.

This pilot study included the following: outdoor gardening, plant identification, elementary plant science, flower arrangement, plant propagation, and related short term projects.

Most of the patients were women; occasionally both men and women were exposed to a project at the same time. Some of the short term projects were executed by a small group of men who were confined to their ward. Three half-days a week were devoted to preparation for classes, written reports, and introduction of Occupational Therapy students to the values of horticulture as a treatment medium.

Outline of Activity

Table 1 has been made to illustrate the system of operation that was used for an outline of activity at Kalamazoo State Hospital.

TABLE I

Outline of Activity

Participation	Monday	Tuesday	Wednesday	Thursday	Friday
Patients only	June 20. a.m. Studied case histories*	21 Directed planting of patients gardens	22 Made corsages for Employees Luncheon *	23 Helped clean up after pageant	24 Studied case histories
	- - - -	- - - -	- - - -	- - - -	- - - -
	p.m. Taught identification of plant parts	Assisted with pageant rehearsal*	Assisted with pageant	Directed flower arrangement*	Assisted with Potter Club*
Patients only	27 a.m. Talked with male patients assigned to horticultural therapy*	28 Directed work in patients' gardens	29 Helped move Occupational Therapy department to new building*	30 Directed male patients planting seeds in pots	July 1 Helped move Occupational Therapy department
	- - - -	- - - -	- - - -	- - - -	- - - -
	p.m. Taught identification of cells and tissues	Directed identification of trees*	Directed filling and placing of planters in new Occupational Therapy building	Directed planting of ferns in planters	Supervised Potter Club
Patients and Occupational Therapy Student A	4 Holiday a.m.	5 Directed work in patients' gardens	6 Helped move Occupational Therapy department	7 Directed male patients in making papier mâché flower pots	8 Worked on reports prepared for class* Instructed student*
	- - - -	- - - -	- - - -	- - - -	- - - -
	p.m	Directed Identification of trees	Directed making of papier mâché flower pots	Directed flower arrangement	Supervised Potter Club*

*These items are explained more fully on pages 26-31

Participation	Monday	Tuesday	Wednesday	Thursday	Friday
Patients and Occupational Therapy Student B	July 11 a.m. Instructed student; prepared for class p.m. Taught leaf functions	12 Directed work in patients' gardens - - - - Directed identification of trees	13 Prepared for class - - - - Directed making spatter prints of leaves	14 Directed male patients in making spatter prints of leaves - - - - Directed flower arrangement	15 Instructed student - - - - Assisted with Potter Club
Patients and Occupational Therapy Student C	18 a.m. Worked on reports; instructed student p.m. Taught functions of stems	19 Directed work in patients' gardens - - - - Directed identification of flowers*	20 Took pictures of patients' gardens;* prepared for class - - - - Directed painting of papier mâché flower pots and planting of cuttings	21 Prepared for class - - - - Directed corsage making and arrangement of exhibit for display case	22 Instructed student - - - - Assisted with Potter Club*
Patients only	25 a.m. Prepared for class p.m. Taught utilization of food by plants	26 Directed work in patients' gardens - - - - Directed identification of trees	27 Prepared soil; ordered plants for new building - - - - Directed filling of hanging baskets	28 Directed male patients painting papier mâché flower pots - - - - Directed flower arrangement	29 Worked on reports - - - - Assisted with Potter Club*

*These items are explained more fully on pages 26-31

Participation	Monday	Tuesday	Wednesday	Thursday	Friday
Patients only	August 1 a.m. Showed slides of Horticultural Therapy activities to medical staff* p.m. Taught growth and movement in plants	2 Directed work in patients' gardens - - - - Directed identification of trees	3 Addressed Michigan Association of Nurserymen	4 Directed male patients potting plants and starting "lawn on a corncob" - - - - Directed flower arrangement	5 Prepared for class - - - - Assisted with Potter Club*
Patients and Occupational Therapy Student D	8 a.m. Instructed student p.m. Taught identification of floral parts	9 Directed work in patients' gardens - - - - Directed cleaning and arrangement of exhibit in display case*	10 Arranged flowers for open house for new Occupational Therapy building - - - - Helped with open house activities	11 Prepared for class; instructed student - - - - Directed identification of flowers	12 Prepared for class; worked on reports - - - - Helped patients make corsages for party
Patients only	15 a.m. Prepared for class p.m. Taught development of fruit and seed dispersal	16 Directed work in patients' gardens - - - - Directed identification of trees	17 Prepared for class - - - - Directed making of "lawn on a corncob"	18 Conference with supervisor; worked on reports - - - - Directed flower arrangement	19 Worked on reports - - - - Assisted with Potter Club*

*These items are explained more fully on pages 26-31

Participation	Monday	Tuesday	Wednesday	Thursday	Friday
Patients and Occupational Therapy student E	August 22 a.m. Instructed student; prepared for class p.m. Taught vegetative reproduction	23 Directed work in patients' gardens - - - - Directed identification of flowers	24 Prepared for class - - - - Directed making of leaf designs*	25 Directed arrangement of flowers for Employees' Luncheon - - - - Directed flower arrangement	26 Prepared for Class - - - - Assisted with Potter Club*
Patients and Occupational Therapy Student F	29 a.m. Instructed student p.m. Taught relationship of plants to their environment	30 Absent	31 Prepared for class - - - - Directed work in patients' gardens	September 1 Prepared for class - - - - Directed making of strawflower mobiles	2 Worked on reports - - - - Supervised Potter Club;* showed educational film
Patients and Occupational Therapy Student G	5 a.m. Holiday p.m	6 Directed work in patients' gardens - - - - Directed identification of trees	7 Instructed student - - - - Directed labeling of trees	8 Cleaned Horticultural Therapy room* - - - - Directed flower arrangement; gave popcorn party for patients	9 Worked on reports - - - - Assisted with Potter Club*

*These items are explained more fully on pages 26-31

Explanation of Procedure

No department of Occupational Therapy can function efficiently without the integration of all its units. The original plan for the Horticultural Therapy group, one of the units of the department, was adapted to fit into the Occupational Therapy program. In the interest of good integration, upon occasion, plans had to be changed, and the patients were encouraged to use their newly-learned skills for the benefits of the larger group, for example: filling planters for the new Occupational Therapy building, arranging flowers for the Employees' Luncheon. Sometimes horticultural activities were canceled in the interest of a general project, such as the pageant, which involved a greater number of patients. The patients were motivated to feel that the horticultural group was not an entity in itself, but that anything the group could do for the good of the hospital community was important.

June 20. The case history of each patient assigned to Horticultural Therapy was studied for better understanding of their individual problems.

June 21. Each year the Occupational Therapy department presents a pageant in which fifty to one hundred patients participate. All other patients' activities are canceled for the day, and the entire Occupational Therapy staff is expected to assist with the preparation, production, and cleaning up afterwards.

June 22. Once a month the hospital Employees Association meets during the noon hour for luncheon, business meeting and short program. Once a year retired employees attend and are each given a corsage or boutonniere. Cut

flowers for the corsages and table decorations are furnished by the hospital greenhouse.

June 23. It was originally planned to cover a different phase in flower arranging--arrangements in low bowls, arrangements in tall containers, miniatures, color combinations, etc.--each week. Considering the hesitance with which the patients participated in a new project, it was decided, rather, to give the group only a few general rules and let them work with the flowers as they wanted, varying the instruction with each patient as she gained self-confidence and skill.

June 24. Potter Club, a selected group of women patients, meets once a week under the direction of a Red Cross Grey Lady. During the summer, the principle activity is planting and maintaining a group garden. No attempt was made to supervise or change the plan that has been followed in the past, but only to assist the volunteer and take charge when she was unable to come.

June 27. It was planned to work with men and women at the same time, and permission was obtained for a selected group of men to meet with the women. But since hospital rules required a male employee to be present whenever male patients were in the group, it was decided to have a mixed group only on the Tuesday afternoon walks, when a male recreation worker could be with them. Several of the short term projects were introduced to another group of men who were too ill to leave their ward.

June 28. The Tuesday afternoon walks were less varied than originally planned. Identification of trees with the intention of labeling

them proved so slow that most of the time was spent in this activity.

June 29. A new building for the Occupational Therapy department was completed recently, all members of the department spent some time helping move supplies and equipment from the old quarters to the new building. The task of filling planters to be placed in the windows and stair landings was assigned to the Horticultural Therapy group.

July 8. Since this was a trial program, more time was spent writing reports and preparing for class than ordinarily would be used this way.

Part of the responsibility of each therapist is to help train Occupational Therapy students who are affiliated with the hospital for a twelve-week period. Each student was assigned to Horticultural Therapy for one week during which she was given a brief history of Horticultural Therapy, was instructed in some of the skills that could be used in a treatment program, and was given opportunity to observe patients as well as assist the therapist.

July 8, p.m. The Potter Club usually spent Friday afternoon in the garden, but because of inclement weather, the group remained inside, discussed the plants, and compared descriptions from books describing flowers and vegetables.

July 19. It was decided to discontinue including men on the plant identification walks since only one or two of the assigned group had been present each week.

July 20. These gardens were examples of unsupervised gardening by some patients who were permitted on the grounds without an attendant.

Some of the gardens had been maintained by the same patients for several years. Pictures were taken to be compared with pictures of supervised activities.

August 1. Pictures of patients engaged in Horticultural Therapy activities were shown to the medical staff to get the medical superintendent's permission to use them with the lecture to be given at the state meeting of the Michigan Association of Nurserymen.

August 9, 10. The dedication of the new Occupational Therapy building was followed by open house and conducted tours of the building. The preceding day was spent in last minute preparation with which patients were encouraged to help. After thirty years of planning for a separate Occupational Therapy building, this opening day was a momentous occasion and afforded a good opportunity to incorporate horticultural enthusiasm.

August 24. Leaves were collected and pressed each time the group studied types of trees. Some of these were used for spatter prints. Others were used for making leaf designs by pasting leaves and leaflets on colored construction paper.

September 8. Since this was planned to be a temporary program, at the end of the twelve week period all borrowed books and other articles were returned, the room cleaned, and the collection of potted plants distributed to various rooms in the new Occupational Therapy building.

Observations

Part of the garden area was divided into small plots, each of which

was assigned to one patient who was responsible for its maintenance. The remainder of the garden was designated for a group project supervised by a volunteer. Gardening was by far the most popular activity.

As the group learned to look for identifying characteristics of leaves, flowers, and other plant parts, interest grew, and a few of the patients became keenly observant. Plant identification was much slower in arousing interest than was gardening. Plant identification appealed to fewer people.

Several leaf and stem cuttings of plants were rooted in moist sand or vermiculite, potted, and used in the Occupational Therapy Department. It was impossible to propagate some species because of the high temperature of the Horticultural Therapy rooms. Propagation provided good contact with living plants and was of great interest to those who were confined indoors.

One afternoon a week was devoted to the study of plant parts and plant functions. A series of ten lessons was planned to expose the patients to a cross section of general elementary plant science. Each lesson consisted of a short lecture with examples, or demonstrations, followed by a simple laboratory exercise in which the patients participated. Educational films were used to supplement some of the lessons. It was observed that as the patients learned more about the plants they became more interested in all phases of horticulture.

Once a week the patients arranged flowers. Following a few rules, they were allowed to choose containers, select flowers, and make any type of an arrangement. Frequently they asked for criticism. Many were eager to help one another.

Making corsages aroused considerable interest, not only among the members of the Horticultural Therapy group, but also among other patients. One of the groups which had not been exposed to the work in Horticultural Therapy was sufficiently interested to request instruction in corsage making, so that the group could use these corsages for special occasions.

Many short projects related to horticulture offered opportunities for self-expression. Spatter prints of leaves allowed choices in color of paper, color of paint, and variety in leaves. Pictures made by pasting pressed leaves to construction paper in an original design also provided opportunity for creative expression.

Papier-mâché pots were made in a variety of shapes, and each painted a different color. This project, although not utilizing plant materials, was closely related to propagation of house plants. Hanging baskets were lined with sphagnum and filled with soil for planting Philodendron and Tradescantia. These provided interest not only during the short time required for constructing them, but also this interest continued day by day as the plants grew and developed.

An attempt was made to grow grass on corncobs which were resting upright in shallow containers of water. This project was disappointing because the moisture did not rise high enough on the cob for the grass seed to germinate.

The group spent one afternoon making mobiles of dried flowers. Since none of the patients had seen mobiles before, this session served to introduce the idea, and to demonstrate some of the principles involved. A mobile made of flowers offered possibilities for artistic expression.

V. SUGGESTED PROGRAM FOR OCCUPATIONAL THERAPISTS

Introduction

Horticultural Therapy presents such a variety of possibilities that some activity may be suitable for any type of patient. The actual program will vary with the type of hospital, the facilities, and the personnel.

If the hospital staff is large enough, one person might give full time to a program of Horticultural Therapy. A therapist might work only with one group of patients who would spend their entire time in horticulture. A second system would be to work with a different group each day, with patients working in other activities the rest of the time. A third system would be one in which the therapist could work with individuals either in the wards or within an Occupational Therapy group.

Where there are not enough therapists so that one can devote full time to horticulture, one afternoon a week might be given to gardening or flower arranging for all patients. When this is not done, patients could engage in a horticultural activity and serve as a source of stimulation for the interest of others in the group.

Frequently most of the actual program is administered by volunteers. Since volunteers ordinarily work one half day a week, it is most suitable to assign a small group of patients to each volunteer. This type of program is most effective when it is directed by a therapist who understands not only the patients, but also the fundamentals of the activity.

Types of Patients

Probably a greater variety of Horticultural Therapy activities has

been used in the treatment of mental illness than any other type of disability. Gardening, plant identification walks, and gathering materials for dish gardens or vegetable dyes can be used to develop group feeling. They provide outdoor activity and help maintain physical well-being. Dish gardens, spatter prints of leaves, and mobiles of flowers provide outlet for creative expression. Vegetables and flowers may be given to those who cannot participate; this will help develop the attitude of sharing. Hoeing and spading can provide release for aggression.

The use of Horticultural Therapy in tuberculosis hospitals is largely diversional during the active stages of the disease. As the lesions heal, horticultural activities may be increased to begin building work tolerance. Activities may range from watching the growth of seedlings, sweet potato vine, or terrarium to limited work in the garden such as tying plants to stakes. Some activities involving mostly movements of hand and lower arm are the following: button gardens, making scrapbooks of flower arrangements, and--for those who are ambulatory--transplanting seedlings into flats.

The duration of hospitalization of patients in general hospitals may vary from a few days to several months. Projects involving growing plants would be of little benefit to the short term patient; flower arranging, making pictures from pressed flowers or leaves, or simple experiments in botany would be of benefit. If the patient can make a garden after he has returned home, he might plan one on paper. Choice of projects for the long term patient such as cardiac or metabolic disorders would be limited only by the nature of the illness.

Many horticultural activities can be used with or without adaptations to increase range of motion, strengthen weak muscles, and increase co-

ordination. Running a lawn mower or pushing a cultivator will help increase strength and coordination of the legs. Pruning will strengthen grasp. Raking may be used to strengthen shoulder girdle muscles and increase range of motion of elbow and shoulder. Shoveling soil affords exercise for nearly every muscle. Making corsages or picking off dead flowers or leaves may be used to develop coordination of the hand.

Horticultural Therapy for the blind should be directed toward increasing tactile sense, and developing self confidence and independence. Plant materials should be chosen which can be recognized by smell or touch. Herbs are excellent, also plants which have thick, hairy, or distinctively shaped leaves. Avoid plants that have thorns or those that will be easily damaged by handling. Potting plants, weeding, loosening soil with a trowel, and counting large seeds for germination tests can be used to advantage.

People who have hearing difficulties often feel neglected. Plant growth is a mysteriously silent function, and can give as much satisfaction to the deaf as to those who have normal hearing. Horticulture provides many opportunities to work in a group. Distributing potted plants or flowers to the wards or making collections of flowers or leaves for study will help develop the feeling of importance.

Children are often intrigued by processes of growth. Watching bulbs come into flower, forcing branches of spring-flowering shrubs, and planting seeds from oranges or grapes foster this interest. Making collections of pressed flowers, making pictures from seeds, or performing simple experiments in plant growth can provide many hours of interesting activity for a child who must remain in bed. Gardening activities such as sowing seeds, picking berries, clipping grass with shears, or pushing a small wheelborrow

can help a cerebral palsied child develop coordination, while getting the benefits of sun, fresh air, and contact with the soil. Many of these children lack this opportunity because of overprotection by the parents.

Horticulture may have special appeal for older people. Many geriatric patients feel that life offers them little purpose. Caring for growing plants and propagation of house plants can help reawaken an interest in life and keep the older person interested in the future. Old people may feel useless and unwanted and a burden to others. Drying and packaging herbs for sale, or dying leaves for winter arrangements may provide enough pin money to help the person maintain a feeling of independence.

Required Facilities

The amount of equipment varies with the number of patients and the types of illness or disability being treated. As with other types of Occupational Therapy, the ingenious therapist must be willing to substitute or adapt equipment to make the most of what facilities are available.

Garden: Whenever possible, outside work should be encouraged. A garden plot devoted only to Horticultural Therapy would be ideal, but the care of the hospital grounds can provide a variety of activities. The area should be large enough so there may be both individual and group gardens. If the patients are to work only a short time in the garden, it may be well to choose a location that can be plowed and fitted with a tractor. While annual flowers and vegetables are probably more useful in a treatment program, added space for perennial flowers, bulbs, and small fruits will add variety to the project.

Greenhouse: A greenhouse is valuable to extend gardening activities

in cold weather throughout the months when it is impossible to garden outdoors. If it is connected to the main building, it will be accessible to wheel chair patients or others who cannot go outside during severe weather.

Cold frame: A cold frame may be used as a supplement or a substitute for a greenhouse for starting seedlings in the spring, for protecting some of the less hardy perennials during the winter, or for rooting potted bulbs prior to forcing them into flower. Heating coils buried in the soil or incandescent light bulbs placed above the plants will increase the length of time for using a hot bed during the winter months.

Work room: Whether or not a greenhouse is available, there should be a work room for activities not directly related to growing the plants. The room should have plenty of table space, sufficient storage for flower containers, pots, soil, tools and other supplies. A refrigerator is necessary if cut flowers are to be stored any length of time. If there is no greenhouse, this room should have water outlets and windows suitable for growing plants. There should be some means of controlling temperature and ventilation. It is preferable to locate this room on the ground floor to minimize the labor of bringing in soil, sand, and other heavy supplies.

Garden cart: If much work is to be done on the wards, a cart with which to transport supplies to the patients is useful. The exact design will vary with the type of projects. It should have bins for sand and soil; space for pots; drawers for florist wire, tape, and ribbons; and space for shears, pliars, knife and other small tools. If the number of stairs makes a cart impractical, a basket is useful.

Propagation case: A propagation case is necessary for rooting

cuttings. Basically it is a box to hold sand with a depth of three inches and covered with a pane of glass. It may be one coldframe within another for added insulation, or it may be a metal frame covered with plastic film and placed over a shallow planting box. For one or two cuttings, two inches of moist sand in a mason jar is satisfactory. Provision for supplying bottom heat is good.

Soil sterilizer: Electricity, steam, or chemicals are used to sterilize soil, and the selection of the method will depend upon the other facilities, the frequency of its use, and the amount of money available.

Library: A bookcase for gardening books for patients to read and reference books for the therapist is necessary. Files of clippings, pamphlets, seed and equipment catalogues are useful.

Tools: Always remember to arrange as much hand work as possible. It may not be necessary to have many tools. The type of program and number of patients will influence the selection of tools.

A suggested listing of tools and equipment is compiled in Table II.

Adaptive equipment: In addition to equipment and tools needed for the gardening processes, other equipment is necessary to adapt these processes to the patients. An ace bandage holds a hand with weak grasp on the handle of a tool. Foam rubber held on the handle of a trowel with adhesive tape makes it large enough for a hand that cannot close tightly. Adhesive tape is necessary to protect sensitive hands from becoming blistered from unaccustomed tools. Wheelchairs should be provided with lap boards at a comfortable height. A plastic sheet should be used to protect bedding, rubber coated gloves for patients who must not use water.

TABLE II

SUGGESTED TOOLS AND EQUIPMENT

Essential

Bamboo lawn rake
Bamboo stakes
Baskets
Flats
File for sharpening hoes
Garden hose (plastic)
Garden line and stakes
Hand duster
Hand sprayer
Hoe
Iron rake
Knife
Labels (wood and plastic)
Lawn mower
Measuring cup
Measuring spoons
Pruning shears
Spade
Spading fork
String
Trowel
Watering can
Yardstick

For specialized projects

Asparagus knife
Carryall for tools
Dibber
Flats
Gloves
Grass edging shears
Hedge shears
Knapsack sprayer
Kneeling pad
Lawn fertilizer distributer
Lawn roller
Lawn sprinkler
Loping shears
Manure fork
Pruning saw
Pushcart for leaves, etc.
Rotary tiller
Sickle
Soil sieve
Soil test kit
Tamper
Turf edger
Wand for weed control chemicals
Wheelbarrow
Wheel hoe cultivator

For ward or work room activities

Cannister set for soils
Chenile wires
Chicken wire
Container for flowers
Floral clay
Floral tape
Florists wire: #28,18,10
Flower holders
Knife
Long-nosed pliars
Magnifying glass
Pots
Ribbons
Scotch tape
Seed catalogues
Shears
Stapler
Syringe
Tablespoon
Thermometer

Limitations

All programs of Horticultural Therapy are limited by the availability of facilities. The size of the garden area determines the extent of outdoor activity.

Horticultural programs are necessarily limited by the nature of the illness or disability. For instance, patients who must lie flat in bed cannot be expected to be as active or engage in as great a variety of activities as wheelchair patients. A patient with tuberculosis cannot work with materials that are dusty; hospital rules forbid the use of certain materials or tools by mental patients.

The living qualities of plants present additional limitations, one of the most serious of which is their seasonal requirement. Not only are outdoor activities seasonal and dependent on the weather, but indoor activities often are dependent on the growth of plants. An unexpected shower can upset the program for several days.

Living plants require regular and constant attention. This is one of the advantages of Horticultural Therapy since it tends to sustain interest. When the patient becomes temporarily too ill or for other reasons is unable to give the plants the care they need, the entire project may fail unless someone else does the work. Special provision may have to be made to care for plants during weekends or vacations, but a break in the sequence of personal attention often defeats the purpose of the therapy.

Many projects which involve a variety of activities do not provide enough of any one acrivity to be beneficial to patients who need to develop a specific muscle. As an example, the use of a trowel for planting

tomato seedlings may provide the desired motion for the wrist and arm, but the process of planting is a minor part of the total work involved in growing tomatoes. Clipping hedges might be an ideal exercise, but few hospitals have enough hedges to provide activity for a long period of treatment.

Horticultural Therapy projects can be messy. Making spatter prints of leaves may be a desirable project for a bed patient, but it is not practical without adequate protection. Corsage making invariably leaves the bed scattered with debris unless precautions are taken to protect the bed with a plastic sheet. With previous planning and consideration for the necessary hospital sanitation, most projects can be adapted to suit the existing conditions.

Cut flowers are perishible. Surpluses cannot be stored for a long period of time.

Disposing of the produce or finished product may be a limiting factor. Propagation of house plants may be the project of choice for one mental patient, but there is a limit to the number of plants one can give away. An important motivation is that the patient feel that the product will be used.

Horticultural projects require more space in relation to the hours of activity provided than do many other crafts or skills. The use of large potted plants may have to be denied because they require space out of proportion to the amount of activity they provide. The interest aroused by growing small fruits is important and the amount of work involved is a good feature, but the space required might be too great to warrant this activity.

It is difficult to time growth of plants so that there is always a variety of projects available. Processes involving living plants cannot be postponed for the convenience of the patient.

Some patients are not interested in plants, or dislike getting their hands dirty. Much of the value of Horticultural Therapy is lost if the patient is not motivated by a genuine interest.

VI. SELECTED PROJECTS APPLICABLE TO TREATMENT PROGRAM

Introduction

The following discussion of projects is not intended to be an exhaustive list, but rather to demonstrate the wide variety of suitable activities of a horticultural nature, and to suggest how each may be used in a treatment program. No attempt has been made to give detailed instructions; instead, sources of further information are included.

Whenever possible, outdoor gardening should be the backbone of a Horticultural Therapy program since it combines contact with living plants, exercise, fresh air, and sunshine. Other outdoor projects requiring a shorter time may be used for variety and are especially valuable during periods when the gardens require less care.

When patients cannot go outside, greenhouse gardening or indoor gardening provide excellent substitutes. Projects using cut flowers offer opportunities for creative expression and for developing the attitude of sharing. Other indoor projects using plant materials are suggested for short term illnesses, to add variety, to maintain interest when outdoor work is inadvisable, and for instruction regarding the structure and function of plants. Many indoor craft projects may be related to a Horticultural Therapy program.

The analysis of activities involved in outdoor gardening lists only those physical or mental processes which are most prominent in each activity.

Projects

Outdoor gardening:

- Flower gardens
- Flowers for cutting
- Fruit
- Gourds
- Herb gardens
- Rock gardens
- Vegetable gardens
- Wall gardens
- Water gardens

Other outdoor projects:

- Construction--coldframe
- Construction--greenhouse
- Dish gardens--gathering materials
- Gathering seeds
- Identification of plants
- Labeling plants
- Lawns
- Nature hunt
- Pruning
- Staking plants

Indoor gardens:

- Aquariums
- Bulbs--forcing
- Bulbs--propagation
- Button gardens
- Dish gardens--planting
- Hanging baskets
- House plants--care
- House plants--propagation
- Kitchen window
- Terraria

Greenhouse gardening:

- Greenhouse gardening

Cut flower projects:

- Corsages
- Dried arrangements
- Drying flowers
- Flower arranging
- Forcing branches of flowering shrubs
- Mobiles of flowers

Other indoor projects using plant materials:

Buds--identification
Buds--dissection
Germination test
Herbs--drying
Herbs--freezing
Identification of plants
Jack-o'-lanterns
Lawn in a petri dish
Plant growth
Potting plants
Preserving flowers in plastic
Pressed flowers--collections
Pressed flowers--pictures
Propagation
Spatter prints of leaves or flowers
Vegetable dyes

Related indoor projects:

Ceramic pots
Construction--garden furniture
Construction--plant tubs
Educational films
Garden planning
Papier mache containers
Reading
Scrapbooks
Soil testing

Description and Source of Information

Outdoor gardening:

Flower gardens--

may be planned to present a unified picture. This project takes more preliminary planning than does a cutting garden in order to arrange the flowers according to height and color. Suitable accessories may be made to be used in this type of garden.

Barber, Angus C. 1954. Annual Flowers. Faber and Faber Ltd., London.

Dakers, J. S. 1951. Annuals for Garden and Greenhouse. W. H. and L. Collingridge, Ltd. London. Transatlantic Arts, Inc. New York.

Hottes, Alfred Carl. 1949. Flower Garden for the Amateur. Midland Publishers. Forest Park, Ill. Distributed by Garden City, N. Y.

Macself, A. J. 1950. Hardy Perennials. W. H. and L. Collingridge, Ltd. London. Transatlantic Arts, Inc. New York,

Robbins, Ann Roe, 1949. How to Grow Annuals. MacMillan. New York,

Rockwell, F. F., and Ester Grayson. 1955. The Complete Book of Annuals. The American Garden Guild and Doubleday and Co., Inc. Garden City, New York.

Flowers for cutting--

may be grown as part of a larger gardening project, or may be a separate project. Gardens to be used only for cutting usually are planted in rows so the flowers may be cut without trampling the other plants. Spading, hoeing, and weeding offer plenty of opportunity for physical exercise.

Emsweller, S. L. 1950. Growing Annual Flowering Plants. U.S.D.A. Farmers' Bulletin 171. U. S. Gov't Printing Office, Washington.

Spry, Constance. 1946. Flowers in House and Garden. J. M. Dent and Sons, Ltd. London.

Thompson, Mollie. 1947. Cut Flowers. Cultivation and Arrangement in the House. Garden Publications, Ltd. 55 Russell Square W. C. I.

Fruit--growing apples--

valuable, if trees are well cared for. Their primary value is in maintaining interest. Dwarf trees or espaliers produce more fruit per unit area than do normal sized trees. What fruit is not eaten raw may be used for cooking projects or made into miniature jack-o'-lanterns.

Chandler, William Henry. 1951. Deciduous Orchards. Lea and Febiger, Philadelphia.

Hedrick, U. P. 1944. Fruits for the Home Garden. Oxford University Press. New York. 61-73.

Seymour, E. L. D., Ed. 1954. (Espalier) The Wise Garden Encyclopedia. Wm. H. Wise and Co. New York. 437-438, 1236-1237.

Southwick, Lawrence. 1948. Dwarf Fruit Trees. Macmillan. New York. 103-115, 249-286.

Fruit--growing blueberries--

requires acid soil so special provision must be made in areas where soil is neutral or alkaline. They may be grown in tubs of acid soil sunk in the ground. A few such plants would add variety to the Horticultural Therapy program and thus help maintain interest.

Johnson, Stanley. 1953. A New Method of Growing Blueberries in the Home Garden. Michigan Quarterly Bulletin. 36 No. 2: 226-229.

Knapp, H. B., and E. C. Auchter. 1941. Growing Tree and Small Fruits. John Wiley and Sons, Inc. New York. 571-580.

Shoemaker, James Sheldon. 1950. Small-Fruit Culture. The Blakiston Co. Philadelphia. 342-375.

Fruit--growing grapes--

a good group project which may be used alone or as part of a larger gardening project. One or two plants will stimulate interest and provide fruit to be eaten raw; several plants can be trained to shade a porch or arbor and will produce enough fruit for jelly.

Knapp, H. B., and E. C. Auchter. 1941. Growing Tree and Small Fruits. John Wiley and Sons, Inc. New York. 195-428.

Magoon, C. A. 1943. Grapes for Different Regions. U. S. D. A. Farmers' Bulletin #1936. Gov't Printing Office, Washington.

No author. 1955. Grapes in the Home Fruit Garden. M. S. C. Cooperative Extension Service, East Lansing, Michigan.

Fruit--growing peaches--

the primary value is the interest stimulated rather than the amount of activity involved in pruning or spraying.

Chandler, William Henry. 1951. Deciduous Orchards. Lea and Febiger. Philadelphia. 325-341.

Harris, Leon, M. H. Haller, John C. Dunegan, L. C. Cochran, and B. A. Porter. 1951. Peach Growing East of the Rocky Mountains. U.S. D. A. Farmers' Bulletin #2021. Gov't Printing Office, Washington.

Hedrick, U. P. 1944. Fruits for the Home Garden. Oxford University Press. New York. 86-97.

Fruit--growing raspberries--
a good group project. It may be divided into separate projects--pruning, picking, spreading mulch--to provide exercise for specific muscles or joints.

Knapp, H. B., and E. C. Auchter. 1941. Growing Tree and Small Fruits. John Wiley and Sons, Inc. New York. 529-562.

Markham, Ernest. 1936. Raspberries and Kindred Fruits. Macmillan and Co., Ltd. London.

Shoemaker, James Sheldon. 1950. Small-Fruit Culture. The Blakiston Co. Philadelphia. 220-323.

Fruit--growing strawberries--
in rows provides opportunity for exercise of most of the muscles and joints through the following activities: preparing the soil, planting the plants, hoeing, weeding, and picking the fruit.

Darrow, George M. 1944. Strawberry Culture: Eastern United States. U. S. D. A. Farmers' Bulletin #1028. Gov't Printing Office. Washington.

Knapp, H. B., and E. C. Auchter. 1941. Growing Tree and Small Fruits. John Wiley and Sons., Inc. New York, 468-494.

Shoemaker, James Sheldon. 1950. Small-Fruit Culture. The Blakiston Co. Philadelphia. 117-219.

Wyld, Robin. 1953. The How-to Book on Strawberries. The Berry Patch. Honeoye Falls, New York.

Fruit--Strawberry Barrel--

will produce fruit in two or three months if everbearing varieties are used. Other than boring the holes in the barrel and filling it with soil, little physical labor is required. The novelty of this method of growing strawberries arouses considerable interest.

Wyld, Robin. 1953. The How-to Book on Strawberries. The Berry Patch. Honeoye Falls, New York. 99-100.

Gourds--

interesting not only while they are growing in the garden, but also as indoor craft projects using the mature gourds. These may be dried completely, then shellacked or waxed and used in dried arrangements or other indoor decoration.

Beattie, W. R. 1940. Useful and Ornamental Gourds. U. S. D. A. Farmers' Bulletin #1849. U.S. Gov't Printing Office. Washington.

Tillinghast, Helen M. 1937. First Gourd Book. Copyright by author.

Young, Sibyllac, 1952. The Curing and Preserving of Gourds. Horticulture. 30:345.

Herb gardens--

provide the same range of activities as other types of gardens. These may contain perennial herbs, annual herbs, or some of each. They require

little space. Some herbs may be grown indoors as pot plants or in window boxes.

Clarkson, Rosetta E. 1942. Herbs, Their Culture and Uses. Macmillan. New York.

Hersey, Jean. 1953. Garden in Your Window. Andrew Malrose. London. 158-171.

Lowman, M.S., and Miriam Birdseye. 1946. Savory Herbs: Culture and Use. U. S. D. A. Farmers' Bulletin #1977. Gov't Printing Office. Washington.

Miloradovich, Milo. 1952. The Home Garden Book of Herbs and Spices. Doubleday, Garden City, New York. 21-44.

Rock gardens--

appropriately placed can add interest to the garden design. Considerable labor is involved in placing the rocks, filling the spaces with top soil, and setting the plants. The care of the garden after it is established is almost entirely handwork. Strawberries are appropriate plants for a rock garden that is near a vegetable or fruit garden.

Bissland, James H. 1938. Common Sense in the Rock Garden. A. T. De La Mare Co., Inc. New York.

Bush-Brown, Louise and James. 1952. America's Garden Book. Charles Scribner's Sons. New York. 624-636.

Phillips, G. A. R. 1946. The Rock Garden and Alpine Plants. W. H. and L. Collingridge, Ltd. London.

Vegetable gardens--

more than flower gardens appeal to many men, though women seem to enjoy both equally well. It is advisable to plant only those vegetables which may be eaten raw unless cooking facilities are available to patients or arrangments are made for the produce to be used in the hospital kitchen.

Coulter, Francis C. 1942. A Manual of Home Vegetable Gardening. Doubleday, Doran and Co., Inc. Garden City, New York.

Dempsey, Paul W. 1942. Grow Your Own Vegetables. Houghton Mifflin Co. Boston.

Foley, Daniel J. 1944. Vegetable Gardening in Color. Macmillan, New York.

Fox, Helen Morgenthau. 1943. Gardening for Good Eating. Macmillan. New York.

Wall gardens--

with plants planted in soil pockets between the rocks are best if planted as they are being built. A completed wall makes a good background for a flower border, or vines may be trained on it.

Bush-Brown, Louise and James. 1952. America's Garden Book. Charles Scribner's Sons. New York. 639-642.

Cattell, Mary Deputy. 1955. Garden on a Wall. Flower Grower. 42:98-99, 141,142.

No author. 1954. Better Homes and Gardens Garden Book. Meredith Publishing Co. Des Moines, Iowa. 249-258.

Water Gardens--

a center of attraction in any garden. The construction can provide several hours of beneficial activity; growing water plants can stimulate interest.

Fletcher, H. L. V. 1951. The Water Garden. John Lehmann. London.

Perry, Frances. 1938. Water Gardening. Charles Scribner's Sons. New York.

Wells, A. Laurence. 1937. Garden Ponds, Fish and Fountains. Federick Warne and Co., Ltd. London and New York.

Other Outdoor Projects:

Construction--coldframe--

a wood working project closely related to horticulture.

Beattie, W. R. 1952. Hotbeds and Coldframes. U. S. D. A. Farmers' Bulletin #1743. Gov't Printing Office. Washington.

Bush-Brown, Louise and James. 1953. America's Garden Book. Charles Scribner's Sons. New York. 724-737.

Construction--greenhouse--

the simpler types may be constructed by a group of patients working under capable direction. Greenhouses should be constructed with special aisles, ramps, and equipment.

Beattie, James H. 1952. Greenhouse Construction and Heating. U. S. D. A. Farmers' Bulletin #1318. Gov't Printing Office. Washington.

Beattie, J. H. 1954. Sash Greenhouses. U. S. D. A. Leaflet #124. Gov't Printing Office. Washington.

No Author. 1953. Sunset Ideas for Building Plant Shelters and Garden Work Centers. Lane Publishing Co. Menlo Park, California. 34-51.

Dish gardens--gathering materials--
furnishes incentive to go on long walks. Moss, tiny native plants, interesting pebbles, and other materials gathered from a nearby woods may be used to create a miniature garden in a dish.

Gathering seeds--
followed by drying, cleaning and packaging helps patients learn names of plants and methods of distribution of seed; provides outdoor activity after weed control is no longer vital.

Bates, H. E. 1941. The Seasons and the Gardener. The University Press, Cambridge. 52-53.

Clarkson, Rosetta E. 1954. Herbs: Their Culture and Uses. Macmillan. New York. 50,65.

Identification of plants--outdoors--
gives added incentive for long walks which will be leisurely, because each new tree or wild flower may have to be studied several minutes before it can be identified. This helps develop keen observation.

Curtis, Carlton C. and S. C. Bauser. The Complete Guide to North American Trees. The New Home Library. New York.

Hausmann, Ethel Hinckley. 1948. Beginner's Guide to Wild Flowers. G. P. Putnam's Sons. New York.

Otis, Charles Herbert. 1938. Michigan Trees. University of Michigan Press. Ann Arbor, Michigan.

Platt, Rutherford. 1952. American Trees. Dodd, Mead and Co. New York.

Selsam, Milicent E. 1950. Play with Trees. Wm. Marrow and Co. New York.

Wherry, Edgar T. 1948. Wild Flower Guide. Doubleday. New York.

Zim, Herbert S. and Alexander C. Martin. 1950. Flowers; A Guide to Familiar American Wild Flowers. Simon and Schuster. New York.

Labeling plants—

helps in learning to identify plants. Making the labels is a good activity for bed patients. Labels for plants to be used by the blind should be made in braille.

Lamson, Mary Deputy. 1951. Garden Housekeeping. Oxford University Press. New York. 43-50.

Schramm, J. R. 1954. A Reexamination of Plant Label Problems with Some New Designs. Morris Arboretum Bulletin. 5:36-43, 47-53.

Seymour, E. L. D. Ed. 1954. The Wise Garden Encyclopedia. Wm. H. Wise and Co., Inc. New York. 725-726.

Lawns--maintaining--

pushing a lawn mower can help develop strength and coordination of legs and trunk. Clipping grass at edges of walk or flower beds helps strengthen grasp.

Flynn, Joseph F. 1951. How to Grow and Keep a Better Lawn. Simon and Schuster. New York. 1-20, 34-74.

Melady, John Hayes. 1952. Better Lawns for Your Home. Grosset and Dunlap. New York. 53-118.

Lawns--making--

involves stremuous physical exercise in leveling, rolling and seeding.

Farnham, Richard, and Van Wie Ingham, Ed. 1946. The Home Owner's Guide to Better Lawns, Trees, and Gardens. Grosset and Dunlap. New York. 103-111.

Flynn, Joseph F. 1951. How to Grow and Keep a Better Lawn. Simon and Schuster. New York. 21-33.

Melady, John Hayes. 1952. Better Lawns for Your Home. Grosset and Dunlap. New York. 17-52.

Nature hunt--

develops keen observation. Small groups of patients may develop a competitive spirit by identification of trees, flowers, birds, other native and cultivated plant or animal life. Working as groups instead of individuals helps develop group feeling.

Buck, Margaret Waring. 1950. In Woods and Fields. Abingdon-Cokesbury Press. New York.

Parker, Bertha Morris. 1952. The Golden Treasury of Natural History. Simon and Schuster. New York.

Pruning--

exercises hands and arms and provides a suitable outlet for the urge to destroy. Pruning is done at various times of the year depending on the type of plant. Few plants will not respond to pruning.

Christopher, Everett P. 1954. The Pruning Manual. Macmillan. New York.

Hudson; Roy L. 1952. Sunset Pruning Handbook. Lane Publishing Co. Menlo Park, California.

Staking plants--

important in maintaining the appearance of a garden. This procedure can be done more easily by two people, thus providing opportunity for patients to learn to cooperate with each other. Tying plants to stakes increases co-ordination of hands and fingers.

Free, Montague. 1952. Let Your Garden Support Its Own. The Home Garden. 19 No. 6:41-43.

Lamson, Mary Deputy. 1951. Garden Housekeeping. Oxford University Press. New York. 35-43.

No Author. 1954. Plant Stakes, Supports, and Ties. Better Homes and Gardens. 32 No. 6:191-192.

Indoor Gardening:

Aquariums--

Probably the easiest of all indoor gardens to maintain; an ideal project for someone who is too ill to participate in any activity. Goldfish may be added to increase interest.

Free, Montague. 1952. All About House Plants. The American Garden Guild, Inc., and Doubleday and Co., Inc. New York. 40-43.

Morgan, Alfred. 1951. An Aquarium Book for Boys and Girls. Charles Scribner's Sons. New York.

Post, Kenneth. 1945. Plants and Flowers in the Home. Orange Judd Publishing Co., Inc. New York. 140-151.

Bulbs--forcing--

a comparatively short term project which requires little effort on the part of the patient if hyacinths, daffodils, paper white narcissus, or amaryllis bulbs are used; a project which stimulates interest because of the rapid growth of leaves and flowers. Potting of bulbs to be rooted is good for ambulatory patients or wheel chair patients.

Field, Xenia. 1954. Growing Bulbs in the House. Collins. London.

Free, Montague. 1952. All About House Plants. The American Garden Guild, Inc., and Doubleday and Co., Inc. New York. 178-196.

Bulbs--propagation--

a project which is often too long for many patients to complete, but the following steps of which make suitable short projects: scoring hyacinth

bulbs, planting bulblets outdoors, and digging and separating bulbs. Propagation is particularly good because it involves the creation of new individual plants.

Adriance, Guy W., and Fred R. Brison. 1939. Propagation of Horticultural Plants. McGraw-Hill Book Co., Inc. London. 94-115.

Emsweller, S. L. 1954. Flowering Bulbs, National Horticulture Magazine 33 No. 1:63-69.

Wood, Allen H., Jr. 1936. Bulbs for Your Garden. Houghton Mifflin Co. Boston. 184-197.

Button gardens—

may be made by glueing small dried flowers to large buttons. Live gardens may be made by using bits of cacti and other succulents. This project offers an opportunity for patients who must be limited to very small projects; good to help develop coordination of the hands.

Casebolt, Florence Waye. 1952. Button Gardens and Diminutive Arrangements. The Button Garden Studio. Berkely, California.

Kyne, Maurice B. 1950. How-to Garden on a Button. The American Home. 44 No. 6:62-63.

Dish gardens--planting--

allows opportunity for creative expression by use of a variety of plants and other materials to form a miniature garden. Planting dish gardens for patients who cannot participate actively develops the attitude of sharing.

Beard, Patten. 1930. Adventures in Dish Gardening. A. T. DeLa Mare Co., Inc. New York.

Noble, Mary, and J. L. Merkel. 1954. Plants Indoors. D. Van Nostrand Co., Inc. New York. 185-191.

Rockwell, F. F., and Ester C. Grayson. 1954. The Complete Book of Flower Arrangements. The American Garden Guild, Inc., and Doubleday and Co., Inc. 223-232.

Hanging baskets--

stimulate interest because of their novelty. Filling the baskets is the major part of the activity unless the project includes making the basket of wood. This project is better done in the work room or potting shed than in the wards. It requires less space for growing plants than if grown in individual pots.

Genders, Roy. The Greenhouse for Pleasure and Profit. Museum Press Ltd. London. 135-143.

Shewell-Cooper W. E. 1938. Home, Window and Roof Gardening. The Epworth Press. London. 39-42.

No Author. 1952. The Portable Garden. Lane Publishing Co. Menlo Park, California. 31-34.

House plants--care--

develops sense of responsibility since plants must not be neglected. The number and type of plants should be determined by the ability and need of each patient.

Crow, Juliana. 1952. Your Indoor Plants. Weidenfeld and Nicolson. London.

Free, Montague. 1952. All About House Plants. The American Garden Guild, Inc., and Doubleday and Co., Inc. New York.

Jones, Margaret E., and H. F. Clark. 1952. Indoor Plants and Gardens. The Archetectural Press. London.

Mulford, Furman Lloyd. 1941. House Plants. U. S. D. A. Farmers' Bulletin 1872. U. S. Gov't Printing Office. Washington.

Noble, Mary and H. L. Merkel. 1954. Plants Indoors. D. Van Nostrand Co., Inc. New York.

House plants--propagation--

a good indoor activity that helps fulfill the urge to create. This project may be limited to cuttings that root most easily, or be made a challenge by selecting species that are difficult to root. Potting of the rooted cuttings may be done as a bedside activity if provision is made to protect the bedding.

Bertrand, A. 1953. Succulent Plants. Philosophical Library. New York. 17-29.

Crow, Juliana. 1952. Your Indoor Plants. Weidenfeld and Nicolson. London. 38-69.

Noble, Mary, and J. L. Merkel. 1954. Plants Indoors. D. Van Nostrand Co., Inc. New York. 161-169.

Thayer, Clark L. 1954. Propagation of House Plants. The National Horticulture Magazine. 33 No. 1:79-86.

Kitchen Window

tops of carrots, beets, and parsnips planted in moist sand make quick-growing "bushes" for miniature gardens. Sweet potatoes grow long luxuriant vines if the lower end is placed in a tumbler of water.

Hersey, Jean. 1953. Gardens in Your Window. Melrose. London. 153-157.

Ickis, Marguerite. 1945. Pastimes for the patient. A. S. Barnes and Co., Inc. New York. 6-7.

Schneider, Herman and Nina. 1951. Plants in the City. John Day Co. New York. 79-82.

Selsam, Milicent E. 1945. Play with Plants. Wm. Morrow and Co. New York. 2-15.

Terraria--

require delicate care after they are planted. This can supply detail for fastidious patients to work with tweezers and manicure scissors. Native plants may be gathered for these indoor gardens, but care must be taken to use together only those plants that require similar environments. Terraria differ from dish gardens in that the container is transparent and deep enough so that it may be covered to keep the moisture in. A terrarium is usually planned to be viewed from the side, while dish gardens are seen from the top.

Free, Montague. 1952. All About House Plants. The American Garden Guild Inc., and Doubleday and Co., Inc. New York. 20-32.

Hersey, Jean. 1953. Garden in Your Window. Melrose. London. 180-185.

Parker, Bertha Morris. 1950. Garden Indoors. Row, Peterson and Co. Evanston, Ill. 21-24.

Greenhouse Gardening:

Greenhouse gardening--

contimues gardening activities throughout the year. This is more appropriate for wheel chair patients or those who may be on their feet only short periods of time than is outdoor gardening.

Chabot, Ernest. 1946. Greenhouse Gardening for Everyone. M. Barrows and Co., Inc. New York.

Dakers, J. S. 1949. Simple Greenhouse Management. Transatlantic Arts. New York.

Reynolds, Ray. 1952. Grow Extra Dollars at Home. Copyright by Ray Reynolds. Armonk, New York.

Taylor, Kathryn S. and Edith W. Gregg. 1941. Winter Flowers in the Sun-heated Pit. Charles Scribner's Sons. New York.

Cut Flower Projects:

Corsages--

may be made from a variety of flowers, leaves, and dried materials. This

is a universally fascinating phase of horticulture because corsages are associated with happy occasions and because they stimulate the urge for giving. This is an excellent project for developing coordination of the hands.

Biddle, Dorthy and Dorothea Blom. 1952. Making Corsages at Home. M. Barrows and Co., Inc. New York.

Drummond, Mary Hazel. 1953. Styling Corsages with Garden Flowers. Macmillan. New York.

Reusch, Glad, and Mary Noble. 1951. Corsage Craft. D. Van Nastrand Co., Inc. New York.

Dried arrangements--

a good winter activity when fresh flowers may be scarce--offers opportunity for creative expression and for increasing coordination of the hands. Working with dried flowers may be considered advanced flower arranging because, due to the brittleness of the materials, greater car must be taken in handling them.

Bear, Elizabeth. 1953. Better Flower Arrangements for Home and Exhibition. Laurel Publishers. Scranton. Distributed by Grosset and Dunlap. New York. 55-61.

Gannon, Ruth. 1949. Winter Bouquets with Color. The Studio Publications. New York.

Ishimoto, Tatsuo. 1951. The Art of Driftwood and Dried Arrangements. Crown Publishers, Inc. New York.

Drying flowers--

provides an outlet for surplus flowers from patients' gardens. Some may be dried satisfactorily in the air; others must be carefully covered with sand, talc, or borax to preserve their shape. These may be used in winter bouquets, to decorate boxes and place cards, or to make three-dimensional pictures.

Miloradovich, Milo. 1952. The Home Garden Book of Herbs and Spices. Doubleday and Co., Inc. Garden City, New York. 185-190.

Rockwell, F. F., and Ester Grayson. 1955. The Complete Book of Annuals. The American Garden Guild and Doubleday and Co., Inc. Garden City, New York. 139-143.

Underwood, Raye Miller. 1952. The Complete Book of Dried Arrangements. M. Barrows and Co. New York. 23-38.

Flower arranging--

by ambulatory, wheel chair, or bed patients provides an outlet for creative expression, develops coordination of the hands, and gives experience in an art that can be continued after the patients recover; one of the most popular skills.

Bear, Elizabeth. 1953. Better Flower Arrangements for Home and Exhibition. Laurel Publishers. Scranton. Distributed by Grosset and Dunlap. New York.

Corrick, Margaret, 1955. Creative Flower Arranging. M. Barrows and Co., Inc. New York.

Ishimoto, Tatsuo. 1947. The Art of Flower Arrangement. Crown Publishers. New York.

Rockwell, F. F., and Ester Grayson. 1954. The Complete Book of Flower Arrangement. The American Garden Guild, Inc., and Doubleday and Co., Inc. New York.

Welch, Nell True. 1942. Sunset Flower Arrangement Book. Lane Publishing Co. Menlo Park, California.

Forcing branches of flowering shrubs--

brings the optimism of spring indoors during the winter months. Cutting branches and placing them in water for the other patients to enjoy provides a short period of invigorating outdoor activity; it helps develop the attitude of sharing.

McClelland, Will. 1948. How to Force Branches in the House. Plants and Gardens. 4:239-240.

McLane, Stanley. 1950. Garden Guide by Months for the Midwest. Frank Glenn Publishing Co. Kansas City, Missouri. 30-31.

Rockwell, F. F., and Ester C. Grayson. 1954. The Complete Book of Flower Arrangement. The American Garden Guild, Inc., and Doubleday and Co., Inc. New York. 255-257.

Mobiles of flowers--

offer opportunity for creative expression while teaching the principles of balance. The completed mobile may be enjoyed by a bed patient who cannot participate in any activity. If dried flowers are used, the moble will

last indefinitely.

Carrick, Margaret. 1955. Creative Flower Arranging. M. Barrows and Co., Inc. New York. 115-128.

Lynch, John. L953. Making Mobiles. Design 55:72-74, 100.

No Author. 1955. How to Make a Mobile. Flower Grower. 42 No. 10:60.

Other Indoor Projects Using Plant Materials:

Buds--identification--

dissection of winter buds to show bud scales, tiny leaves or flowers for next spring. This may be used as a lesson in elementary plant science, or to arouse interest.

Otis, Charles Herbert. 1954. Michigan Trees. University of Michigan Press. Ann Arbor.

Trelease, William. 1918. Winter Botany. Published by author. Urbana.

Wilson, Carl L. 1954. Botany. The Dryden Press. New York. 24-26.

Bulbs--dissection--

to show the miniature plant within a hyacinth bulb. This may be used as part of a lesson on specialized plant parts in the fall to stimulate curiosity and interest. This project requires only a few minutes.

Post, Kenneth. 1955. Florist Crop Production and Marketing. Orange Judd Publishing Co., Inc. New York. 568-834.

Germination test--

a necessity when using donated seeds of unknown age; a good pre-season project to arouse interest. Counting large seeds can help blind persons develop their tactile sense.

Adriance, Guy W., and Fred R. Brison. 1939. Propagation of Horticultural Plants. McGraw-Hill Book Co. New York. 62-63.

Clarkson, Rosetta E. 1954. Herbs; Their Culture and Uses. Macmillan. New York. 18-19.

Seymour, E. L. D., Ed. 1954. The Wise Garden Encyclopedia. Wm. H. Wise and Co., Inc. New York. 1114-1115.

Herbs--drying--

picking the leaves is good exercise for the hands; this may be done by blind persons because the plants may be identified by scent. Drying and packaging are indoor projects.

Clarkson, Rosetta E. 1942. Herbs; Their Culture and Uses. Macmillan. New York. 46-51.

Hewer, D. G., 1944. Practical Herb Growing. G. Bell and Sons, Ltd. London. 23-33.

Miloradovich, Milo. 1952. The Home Garden Book of Herbs and Spices. Doubleday. Garden City, New York. 45-49.

Herbs--freezing--

where facilities are available is a good method of keeping the flavor and odor of the herbs.

Miloradovich, Milo. 1953. The Home Garden Book of Herbs and Spices. Doubleday. Garden City, New York. 51-56.

Identification of plants--indoors--
a collection of potted plants is valuable for teaching plant characteristics--a good winter project.

Bertrand, A. 1953. Succulent Plants. Philosophical Library. New York.

Noble, Mary, and J. L. Merkel. 1954. Plants Indoors. D. Van Nostrand Co., Inc. New York.

Jack-o'-lanterns--
a good indoor activity for Halloween except for patients who are not permitted to handle knives. Provision may be made ahead of time by planting plenty of pumpkin seed each spring. This activity is enjoyed by all ages.

Lawn--in a petri dish--
or on a moist sponge--a simple project to stimulate interest. The "lawns" may be used as part of a dish garden.

Plant growth--
and other phases of plant physiology can be demonstrated by experiments which may be as simple as laying a potted coleus plant on its side to demonstrate negative geotropism or as complex as elaborate experiments in plant nutrition. These experiments may be used as part of a lesson or as a separate project.

Loomis, Walter E., and Charles A. Shell. 1937. Methods in Plant

Physiology. McGraw-Hill Book Co., Inc. New York and London.

Parker, Bertha Morris, and Orlin D. Frank. 1953. Plant Factories. Row, Peterson and Co. Evanston, Ill. 35-36.

Schneider, Herman and Nina. 1951. Plants in the City. John Day Co. New York. 49-56.

Selsam, Milicent E. 1949. Play with Plants. Wm Marrow and Co. New York. 40-63.

Potting plants--

a good activity involving mostly hands and arms. This is best done in the greenhouse or workroom, but may be done to a limited extent in wards or as a bedside occupation.

Crow, Juliana. 1952. Your Indoor Plants. Weidenfeld and Nicholson. London. 58-69.

Free, Montague. 1952. All About House Plants. The American Garden Guild, Inc. and Doubleday and Co. New York. 66-73.

Noble, Mary, and J. L. Merkel. 1954. Plants Indoors. D. Van Nostrand Co., Inc. New York. 10-26.

Preservation of flowers in plastic--

a specialized procedure. Imbedding living plant material in a thermosetting plastic is definitely an advanced project for skilled patients. Either dry or fresh flowers may be used, though some fresh flowers change color. The specimens thus preserved may be kept for identification purposes or used as paper weights.

Bick, Alexander F. 1954. Plastics for Fun. Bruce Publishing Co. Milwaukee 88-89.

Walton, Harry. 1951. Plastics for the Home Craftsman. McGraw-Hill Book Co. New York. 173-183.

Pressed flowers--collection--

a three-phase project: gathering and pressing the flowers, mounting the dried flowers, and using the collection for plant identification. Dividing the project among three individuals or three groups will stimulate the patients' interest in each other.

Underwood, Raye Miller. 1952. The Complete Book of Dried Arrangements. M. Barrows and Co. New York. 92-129.

Zarchy, Harry. 1943. Let's Make More Things. Alfred A. Knopf. New York. 140-141. (leaf or flower press).

Pressed flowers--pictures--

a good bedside project using flowers or leaves that ambulatory patients have gathered. The complete picture may be framed.

O'Brien, Patricia. 1950. How to Decorate with Pressed Leaves. Better Homes and Gardens. 29 No. 2:74,260.

No Author. 1952. Flowers Under Glass. School Arts. 51:203.

Propagation--cuttings--

the usual method for propagating many house plants, such as geranium, coleus, and chrysanthemum. This may also be used to propagate many plants usually

grown outdoors. Cuttings are made of leaf, stem, or root depending on the species.

Adriance, Guy W., and Fred R. Brison. 1939. Propagation of Horticultural Plants. McGraw-Hill Book Co. New York. 126-147.

Gardner, Victor R. 1951. Basic Horticulture. Macmillan. New York. 284-293.

Skinner, Henry T. 1954. Leaf-and-Bud Cuttings. National Horticulture Magazine. 33 No. 1:19-21.

Propagation--graftage--

an advanced project for skilled patients, but not recommended for mental patients because grafting requires the use of very sharp knives. This may be used on grape, apple and spruce.

Adriance, Guy W., and Fred R. Brison. 1939. Propagation of Horticultural Plants. McGraw-Hill Book Co. New York. 149-212.

Gardner, Victor R. 1951. Basic Horticulture. Macmillan. New York. 293-310.

Whitehouse, W. E. 1954. Budding and Grafting. National Horticulture Magazine. 33 No. 1:25-36.

Propagation--layering--

method used for propagating pyrachantha, grapes, raspberries, and ficus. Probably not enough new plants would be needed to use this project for exercise of a specific joint, but this would be a good project for arousing and sustaining interest.

Adriance, Guy W., and Fred R. Brison. 1939. Propagation of Horticultural Plants. McGraw-Hill Book Co. New York. 116-125.

Creech. John L. 1954. Layering. National Horticultural Magazine 33 No. 1:37-43.

King, E. J. 1950. The Propagation of Plants. Hutchinson's Scientific and Technical Publications. New York. 76-109.

Propagation--seeds--

sown in pots or flats provide plants for outdoor gardens. In areas having a short growing season it is necessary to start some varieties indoors before the weather is suitable for outdoor planting. Some house plants can be propagated by seeds. Transplanting the seedlings to other flats so they can have more room provides activity for the hands.

Creech, J. L., and W. O. Hawley. 1955. Sphagnum Moss for Plant Propagation. U. S. D. A. Farmers' Bulletin No. 2085. Gov't Printing Office. Washington.

Dempsey, Paul W. 1942. Grow Your Own Vegetables. Houghton Mifflin. Boston. 118-128.

Fox, Helen Morgenthau. 1943. Gardening for Good Eating. Macmillan. New York. 13-27.

King, E. J. 1950. The Propagation of Plants. Hutchinson's Scientific and Technical Publications. New York. 15-83.

Spatter prints of leaves or flowers--

may be used for identification of plants or to decorate posters or signs. This activity provides exercise for hands and arms. It may be used for bed patients if provision is made to protect the bed.

Ickis, Marguerite. 1943. Arts and Crafts. A. S. Barnes and Co. New York. 43.

Parker, Cornelia Stratton. 1952. Your Child Can Be Happy in Bed. Thomas Y. Crowell Co. New York. 169.

Zarchy, Harry. 1943. Let's Make More Things. Alfred A. Knopf. New York. 142-143.

Vegetable dyes--

gathering and preparing plant materials to be used for dyeing cloth will appeal to the adventurous person who wants to try "something different". This is a good short term project.

Clarkson, Rosetta E. 1942. Herbs; Their Culture and Uses. Macmillen. New York 52-57.

Furry, Margaret S., and Bess M. Viemont. 1935. Home Dyeing with Natural Dyes. U. S. D. A. Washington.

Jaeger, Ellsworth. 1949. Berry Juices and Plant Dyes. Nature Magazine. 42:473-474.

Leechman, Douglas. 1943. Vegetable Dyes. Oxford University Press. Toronto.

Related Indoor Projects:

Ceramic flower pots and containers--

will maintain interest in horticulture during the winter especially where there is little work to be done with living plants. Pots may be made by pouring "slip" into a plaster of paris mold; more opportunity for self expression is possible with other methods.

Dougherty, John Wolfe. 1939. Pottery Made Easy. The Bruce Publishing Co. New York.

Ickis, Marguerite. 1943. Arts and Crafts. A. S. Barnes and Co. New York. 255-272.

Kenny, John B. 1949. The Complete Book of Pottery Making. Greenberg Publisher. New York.

Construction--garden furniture--

an indoor project which may be completed indoors to maintain interest in gardening during bad weather or to stimulate horticultural interest in groups not directly engaged in gardening.

Champion, Paul V. 1946. Attractive Lawn Furnishings. The Bruce Publishing Co. Milwaukee.

Wakeling, Arthur, Ed. 1953. Home Craftsman's Book of Garden Furniture, Barbecues, and Fences. The Home Craftsman Publishing Corp. New York. 5-52.

No Author. 1953. How to Build Outdoor Furniture. Lane Publishing Co. Menlo Park, California.

Construction--plant tubs and flower pot stands--
an indoor project. The tubs may be used for large plants outdoors or in the greenhouse.

Wakeling, Arthur, Ed. 1953. The Home Craftsman's Book of Garden Furniture, Barbecues, and Fences. The Home Craftsman Publishing Corp. New York. 78-79, 82.

No. Author. 1952. The Portable Garden. Lane Publishing Co. Menlo Park, California. 15-30.

Educational films--
an activity enjoyed by nearly everyone. Films may be used for teaching purposes, arousing interest, or merely diversion. This is especially suitable for bed patients or closed ward patients.

Garden planning--
a good short term project for bed patients who have a garden at home. This may be used as an indoor phase of a garden project at the hospital. It may be no more than planning the number of rows and plants per row in a ten foot plot, or landscaping an entire home lot.

Farnham, Richard, and Van Wie Ingham. 1946. The Home Owner's Guide to Better Lawns, Trees, and Gardens. Grosset and Dunlap. New York. 3-90.

Glick, D. Newton. 1955. Landscape and Planning for Residential Properties. Michigan State University. East Lansing, Michigan.

Korbobo, Raymond P. 1954. Complete Home Landscaping and Garden

Guide. Wm. H. Wise and Co., Inc. New York.

Morris, Norman A. 1946. Your Book of Garden Plans. The Garden Press. Los Angeles.

No Author. 1950 Sunset Ideas for Landscaping Your Home. Lane Publishing Co. Menlo Park, California.

Papier-mâché containers--

may be made in a variety of sizes, shapes, and colors for dried arrangements. They can be used as pots for cacti and other plants that require little water.

Moritz, Laverne. 1953. Papier-Mâché. LaVee Studio. New York. 3-11.

Zarchy, Harry. 1953. Creative Hobbies. Alfred A. Knopf. New York. 158-159.

Reading--

particularly suitable for bed patients, but may be enjoyed by anyone. Reading about the plants in one's garden can lessen the disappointment of being prevented from working outdoors because of unexpected rain.

Clarkson, Rosetta E. 1940. Green Enchantment. Macmillan New York.

Goethe, C. M. 1948. Geogardening. The Keystone Press. Sacramento, California.

Grigson, Geoffrey. 1952. Gardenage. Routledge and Keegan

Paul. London.

Hottes, Alfred C. 1949. Garden Facts and Fancies. Dodd, Mead and Co. New York.

Scrapbooks--

a good individual project for bed patients. Ideas for flower arrangements, step-by-step illustrations of common garden procedures, or easily understood instructions for culture of plants may be found in many of the magazines that accumulate in hospitals. Seed and nursery catalogues are good sources for pictures of flowers, vegetables, shrubs, and house plants that may be used for learning plant names when actual specimens are available.

Soil testing--

a valuable procedure especially in greenhouse gardening. Patients interested in the scientific aspect of gardening would enjoy this activity. Kits with specific instructions are available at most garden supply houses and most state agricultural experiment stations.

Millar, Charles Ernest, and Lloyd M. Turk. 1951. Soil Science. John Wiley and Sons, Inc. New York. 320-321.

Upmann, Elsa. 1941. The Visual Garden Manual. Lane Publishing Co. San Francisco. 37.

Additional Source Material

Children's Books:

Bates, H. E. 1941. The Seasons and the Gardener. Cambridge University Press. Cambridge.

Buck, Margaret Waring. 1941. The Golden Treasury of Natural History. Simon and Schuster. New York.

Cormack, M. B. 1951. The First Book of Trees. Franklin Watts, Inc. New York.

Dickenson, Alice. 1953. The First Book of Plants. Franklin Watts, Inc. New York.

Kains, M. G. 1937. Adventures in Gardening for Boys and Girls. Greenburg, Publisher. New York.

Marshall, Virginia Stone. 1954. Flower Arranging for Juniors. Little, Brown and Co. Boston.

Morgan, Alfred. 1951. An Aquarium Book for Boys and Girls. Charles Scribner's Sons. New York.

Parker, Bertha Morris. 1951. Garden Indoors. Row, Peterson and Co. Evanston, Illinois.

Parker, Bertha Morris. 1952. Seeds and Seed Travels. Row, Peterson and Co. Evanston, Illinois.

Parker, Bertha Morris, and Orlin D. Frank. 1953. Plant Factories. Row, Peterson and Co. Evanston, Illinois.

Parker, Bertha Morris, and Illa Podendorf. 1952. The Plant World. Row, Peterson, and Co. Evanston, Illinois.

Schneider, Herman and Nina. 1951. Plants in the City. The John Day Co. New York.

Selsam, Milicent E. 1945. Play with Plants. Wm. Morrow and Co., Inc. New York.

Selsam, Milicent E. 1950. Play with Trees. Wm. Morrow and Co., Inc. New York.

Weber, Irma E. Bits that Grow Big. William R. Scott, Inc. New York.

Equipment:

Herbert, Fred W., and Oswald K. Hoglund. 1953. An Improved Method

of Making Plant Containers. U. S. Government Printing Office. Washington.

National Committee on Wood Utilization. 1929. You Can Make It. U. S. Government Printing Office. Washington. 26-37.

Reynolds, Ray. 1952. Grow Extra Dollars at Home. Copyright by Ray Reynolds. Armonk, New York.

Garden Calendars:

Biles, Roy E. 1943. The American Family Garden Book. Garden City, New York. 129-160.

Lamson, Mary Deputy, 1951. Garden Housekeeping. Oxford University Press, New York. 143-161.

McLane, Stanley, 1950. Garden Guide by Months for the Midwest. Frank Glen Publishing Co. Kansas City, Missouri.

Melady, John Hayes. 1952. Better Flowers for Your Home and Garden. Grosset and Dunlap. New York. 11-27.

Greenhouse Calendar:

Dorrance, Anne. 1935. Gardening in the Greenhouse. Doubleday, Doran and Co. New York. 115-118.

Reynolds, Ray. 1952. Grow Extra Dollars at Home. Copyright by Ray Reynolds. Armonk, New York. 28.

Tools:

Biles, Roy E. 1943. The American Family Garden Book. Garden City, New York. 13-16.

Bush-Brown, Louise and James. 1953. America's Garden Book.. Charles Scribner's Sons, New York.

Coulter, Francis C. 1942. A Manual of Home Vegetable Gardening. Doubleday, Doran, and Co., Inc. Garden City, New York. 29-45.

Foley, Daniel J. 1944. Vegetable Gardening in Color. Macmillan. New York. 229-232.

Seed and Supply Companies:

American Bulb Co. 1335 W. Randolph St., Chicago 7, Illinois;

31 W. 27th St., New York, New York.

George G. Ball, Inc. W. Chicago, Illinois.

Burgess Seed and Plant Co., Galesburg, Michigan.

W. Atlee Burpee Co., Huntington Park Ave. at 18th St., Philadelphia, Pennsylvania; Clinton, Iowa; Riverside, California.

D. V. Burrell Seed Growers Co., Rocky Ford, Colorado.

Farmer Seed and Nursery Co., Faribault, Minnesota.

Ferry-Morse Seed Co., Detroit, Michigan; Mountain View, California.

A. M. Leonard and Son, Inc., Piqua, Ohio.

National Agricultural Supply Co. Fort Atkinson, Wisconsin.

S. S. Skidelsky and Co., Inc., 144 W. 27th St., New York 1, New York.

Templin-Bradley Co., Seeds and Bulbs, Cleveland 2, Ohio.

Steffek, Edwin F., Ed. Plant Buyers Guide of Seed and Plant Materials in the Trade. Massachusetts Horticulture Society. Boston, Massachusetts.

Activities to be Analyzed

The following activities have been selected as most typical projects:

Hoeing	Pulling weeds
Raking	Using hand weeder
Spading	Pushing cultivator
Digging with trowel	Planting seeds or bulbs
Pruning with hand shears	Strawberry barrel
Pushing lawn mower	Transplanting seedlings
Clipping grass at edge of borders	

Analysis of Activities

Hoeing:

Technique is:

Quieting--good outlet for energy.

Stimulating--only if the flowers or vegetables are particularly interesting to patient.

Monotonous--especially if garden is planted in rows.

Varied--only in kinds of plants being grown.

Simple--repetition of a single movement.

Slow--if done well; speed depends on speed of patient, soil texture, and number and size of weeds.

Adaptable--handle may be built up for patient with weak grasp; weight may be attached to hoe for aided resistance; short handled hoe may be used for children.

Physical processes involved:

Fingers and thumb--statically flexed position in grasping handle.

Shoulder joint--extension, adduction against resistance; flexion, abduction.

Posture--must be watched since there is a tendency to bend forward

Eye strain--little eye strain except when hoeing around small seedlings.

Fatigue--must be watched especially on very warm days.

Mental Processes involved:

Interest--through interest in the plants that are grown, or desire for a "clean" garden.

Concentration--in order not to destroy the wrong plants.

Initiative--little required unless patient is to take full responsibility for the care of his garden.

Mental capacity of patient:

Normal to high--as one process of a larger project.

Borderline--good for this grade.

Low--if garden is planted in rows and plants are large enough to be recognized easily.

Noise involved--little.

Type of patient--men, women, older children.

Recommended for:

Mental patients:

Deteriorated--in gardens where a variety of plants are grown.

Excited--good outlet for energy; repetition of motion may be quieting.

Depressed--when working among bright flowers or if patient especially enjoys gardening.

Tubercular--only in cases where disease is arrested.

Physical disabilities--for increasing strength of arm and shoulder muscles and extensor muscles of trunk and legs.

Deaf--not handicapped.

Geriatric--if patient is interested in gardening; watch for fatigue.

Raking:

Technique is:

Quieting--good outlet for energy.

Monotonous--particularly so if another patient carries away the leaves or weeds raked together.

Simple--repetition of one motion.

Moderately fast.

Adaptable--handle may be built up for patient with weak grasp; a wide rake provides more resistance than a narrow rake; patient, by conscientious effort, can use length of stroke or position best for him.

Physical processes involved:

Fingers and thumb--stacically flexed position in grasping handle.

Elbow--flexion against resistance; extension.

Shoulder--extension against resistance; flexion, abduction, adduction. Motion is primarily flexion-extension if rake is moved essentially in sagittal plane; motion is primarily abduction--adduction if rake is moved in lateral plane.

Posture--watch for tendency to bend forward.

Eye strain--none.

Fatigue--watch; especially if patient uses a very long stroke; less noticable if patient works with a smooth rhythm.

Mental processes involved:

Interest--only in the completed task.

Concentration--little required.

Initiative--none.

Mental capacity of patient:

Normal to high--only if raking is one step of a larger project.

Borderline--good.

Low--may require someone else to carry away trash that is raked together.

Noise involved--little.

Type of patient:

Men, women.

Children--use size rake in proportion to size of child.

Recommended for:

Mental patients:

Excited--good for release of energy.

Tubercular--only in cases where disease is arrested.

Physical disabilities--to strengthen arm and shoulder muscles and extensor muscles of trunk and legs; in some cases may be useful to increase range of motion of shoulder joint.

Deaf--not handicapped.

Spading:

Technique is:

Quieting--good outlet for energy and aggressive tendencies.

Monotonous--if large area is to be spaded.

Simple--repetition of a few motions.

Slow--all spading is slow; double digging is still slower.

Physical processes involved:

Fingers and thumb--statically flexed position in grasping handle.

Forearm--pronation, supination in emptying spade.

Elbow--flexion against resistance when lifting spadeful of soil.

Hips--extension against resistance in lifting spadeful of soil, extension against resistance of hip in pushing spade into soil; flexion.

Knees--extension against resistance in lifting spadeful of soil; extension against resistance of one knee in pushing spade into soil; flexion.

Ankle--plantar flexion against resistance when pushing spade into soil; there is little actual motion, rather the muscles involved in plantar flexion are used to stabilize the ankle.

Posture--watch that lifting is done with leg muscles rather than with the back.

Fatigue--especially if patient is not accustomed to physical labor.

Mental processes involved:

Interest--primarily in the flowers or vegetables to be grown.

Concentration--little needed.

Initiative--little.

Mental capacity of patient:

Normal to high--only as part of a larger project or for specific physical exercise.

Borderline--good.

Low--may need supervision to do job neatly.

Noise Involved--little

Type of patient:

Men.

Women--fatigue more prominent than with men.

Recommended for:

Mental patients:

Deteriorated--may do a good job, but this activity has little value other than helping to maintain general physical health.

Excited--excellent for release of energy.

Depressed--only if patient particularly likes gardening.

Epileptic--slight danger of injury in case of falling.

Tubercular patients--not recommended.

Physical disabilities--strengthen flexor and extensor muscles of trunk, extenson muscles of knee and hip, plantar flexor muscles of ankle; increase range of pronation and supination of forearm.

Amputation--prosthetic training.

Blind--possible.

Deaf--not handicapped.

Geriatric--not recommended.

Precautions--watch for blisters of hands; work for very short periods until patient becomes accustomed to this activity.

Digging with trowel:

Technique is:

Quieting--may be used as outlet for aggression.

Stimulating--in the variety of plants which are being planted.

Monotonous--only if large numbers of plants are being planted, or if the trowel is used to "spade" the soil in greenhouse benches.

Simple--repetition of one action.

Slow--if used to dig holes for large plants, or if used to loosen soil in large areas.

Adaptable--handle may be padded for patient with weak grasp, or ace bandage may be bound around the hand to hold finger in flexed position; wide trowel may be used for greater resistance than narrow trowel.

Physical process involved:

Fingers and thumb--statically flexed position in grasping handle.

Wrist--radial deviation against resistance when using trowel as a spade for digging.

Forearm--pronation and supination.

Elbow--some flexion, extension; extension against resistance when using trowel as a dibber for opening holes for small plants.

Hip--extension against resistance in moving from place to place

when working in stooping or kneeling position; flexion.

Eye strain--none.

Fatigue--working in stooped position can be very fatiguing at first; watch for fatigue in muscles of forearm.

Mental processes involved:

Interest--in the plants being planted.

Concentration--to space holes correctly.

Initiative--little.

Mental capacity of patients:

Normal to high--may find this activity boring unless seen as part of a larger project.

Borderline--probably would enjoy this.

Low--would need supervision for spacing holes correctly.

Noise involved--little.

Suitable for--greenhouse, outdoors.

Type of patient--men, women, children.

Recommended for:

Mental patients:

Deteriorated--would be beneficial only in helping maintain general physical health.

Excited--good for release of energy.

Depressed--only if the patient especially enjoys gardening.

Epileptic--little danger of injury in case of falling.

Tubercular patients--when disease had been arrested.

Cardiac--acceptable in some cases; watch for fatigue.

Physical disabilities--strengthen pronator and supinator muscles of forearm; strengthen extensor muscles of spine, hip and knee.

Blind--lossening soil with a trowel possible.

Deaf--not handicapped.

Geriatric--if patient enjoys gardending.

Precautions--watch for fatigue in patients who are working in position to which they are not accustomed; watch for blisters on the hands.

Pruning with hand shears:

Technique is:

Quieting--good outlet for energy; outlet for urge to destroy.

Stimulating--if patient particularly enjoys pruning.

Varied--because of the varied positions necessary to reach the branches or shoots to be cut.

Simple--one principle motion.

Complex--entire bush must be studied to know which branch or shoot to cut and which to leave.

Moderately rapid.

Physical processes involved:

Fingers--flexion against resistance.

Thumb--flexion, opposition against resistance.

All other motions of upper extremities are involved in reaching for the right spot to cut, but these are so varied they cannot be classified.

Hip and knee--extension against resistance (the weight of the body) when moving from place to place in a stooped position as when cutting out dead raspberry canes.

Posture--standing or stooped; watch that patient does most of the bending at the hip joint.

Eye strain--slight.

Fatigue--not an important factor except in the muscles of the forearm because there are so few stereotyped movements.

Mental processes involved:

Interest--interest in improving appearance of grounds.

Concentration--each bush or shrub is different and requires individual treatment.

Initiative--in deciding which branches to cut.

Mental capacity of patient:

Normal to high--yes.

Borderline--some of these could be taught the process.

Low--only with constant individual supervision.

Noise involved--little.

Type of patient:

Men.

Women--some might enjoy this activity.

Recommended for:

Mental patients:

Deteriorated--yes, if they have done similar work before.

Excited--only mildly excited unless patient can be closely supervised; otherwise they might damage the bushes severely.

Depressed--if this activity appeals to the patient.

Epileptic--patient could be badly scratched if he fell into the bushes.

Tubercular patients--when disease has been arrested.

Physical disabilities--strengthen grasp.

Amputation--good for training remaining hand; excellent to test performance in prosthetic training of upper extremities.

Blind--no.

Deaf--not handicapped.

Geriatric--good because it is not strenuous work; patient can work at his own rate of speed.

Pushing lawn mower:

Technique is:

Quieting--release for energy; the sound of a lawn mower may be soothing to some individuals.

Monotonous--unless area to be mowed is very irregular in shape.

Simple--little more than walking.

Rapid--a lawn mower covers space quickly and works best when pushed at a fairly rapid rate.

Adaptable--provision may be made for increasing tension of the wheels; lawn spreader or very light roller provide the same motions with less resistance.

Physical processes involved:

Fingers and thumb--statically flexed position in grasping handle.

Elbow--held in flexed position; force is against extensor muscles.

Shoulder joint--upper arm is held in a partially flexed and abducted position; force is against flexor muscles.

Scapula--abduction against resistance.

Hip and Knee--extension against resistance; flexion.

Ankle--plantar flexion against resistance; flexion.

Posture--no particular problem.

Eye strain--none.

Fatigue--frequent rests necessary, especially for those who are not accustomed to this activity.

Mental processes involved:

Interest--through interest in a neat lawn.

Concentration--little.

Initiative--no.

Mental capacity of patient--suitable for any mental level.

Noise involved--some, though this type of noise is not irritating.

Type of patient:

Men, primarily.

Women--use smaller mowers.

Older children--use smaller mowers.

Recommended for:

Mental patients:

Deteriorated--only to help maintain general physical health.

Excited--excellent outlet for energy.

Depressed--if patient enjoys mowing lawn.

Tubercular patients--not recommended.

Physical disabilities--strengthen extensors of knee and hip, abdominal muscles, and flexors of shoulder joint.

Deaf--not handicapped.

Clipping grass at edge of borders:

Technique is:

Quieting--because of the energy expended and the monotony.

Stimulating--if patient enjoys working near flowers.

Monotonous--because of repetition of motion and one kind of material being cut.

Simple--one primary motion involved; no decisions to make.

Slow--shears will cut only a few blades at once; moving in stooped position or kneeling position is slow.

Adaptable--long-handled grass shears, which eliminate stooping, are available; use of regulation shears may be done in kneeling position or stooped position.

Physical processes involved:

Fingers and thumb--flexion against resistance; extension.

Spine--some lateral flexion and rotation toward hand that is being used.

Hip and knee--extension against resistance (the weight of the body) flexion.

Posture--kneeling position or stooped position; standing position if using long-handled shears; watch for excess bending of

the spine.

Eye strain--slight.

Fatigue--particularly of forearm muscles and extensor muscles of hip.

Mental processes involved:

Interest--through interest in a neat lawn.

Concentration--some because each snip of the shears cuts only a very small area.

Initiative--no.

Mental capacity of patients--suitable for all levels, though patient with normal to high intelligence would probably find it boring in comparison to pruning which involves similar physical processes.

Noise involved--slight.

Type of patient--suitable for men, women, or children.

Recommended for:

Mental patients:

Deteriorated--if work is done near attractive flower borders; otherwise good only to help maintain good physical health.

Excited--yes, though too slow to appeal to many excited patients.

Depressed--only if working near bright flowers.

Epileptic--slight danger of injury in case of falling.

Tubercular patients--clipping with long handled shears permissible when patient is well enough to engage in activities while

walking about.

Physical disabilities--excellent for strengthening grasp.

Amputation--to develop remaining hand.

Blind--possible.

Deaf--not handicapped.

Geriatric--yes, though some may have difficulty working in stooped position.

Precautions--watch for blisters on the hand; watch for fatigue in muscles of forearm.

Pulling weeds:

Technique is:

Quieting--outlet for destructive urge especially if weeds are large.

Stimulating--when working among bright flowers or other plants in which the patient is especially interested.

Monotonous--particularly if area to be weeded is large.

Varied--by the size of weed, and species of plants being grown.

Simple--mostly repetition.

Physical processes involved:

Fingers--flexion, extension.

Thumb--opposition.

Wrist--extension, hyperextension, and radial deviation against resistance; flexion and ulnar deviation.

Forearm--primarily held in position of pronation when pulling small weeds.

Elbow--flexion against resistance when pulling larger weeds.

Shoulder joint--hyperextension against resistance when pulling larger weeds.

Spine--some rotation and lateral flexion toward hand that is being used.

Hip and knee--extension against resistance when moving from place to place in stooped position; flexion.

Posture--kneeling, stooping when working outdoors; standing, sitting if working in greenhouse or ward. Watch for excessive bending of the spine.

Eye strain--some if plants are small.

Fatigue--not a prominant factor unless working in one position for a long time.

Mental processes involved:

Interest--through interest in plants being grown.

Concentration--to avoid pulling the wrong plants.

Initiative--little involved unless patient is to take full responsibility for his garden.

Mental level of patient:

Normal to high--if weeding is part of the patient's garden project.

Borderline--yes.

Low--only if garden plants and weeds are easily distinguished.

Noise involved--none.

Suitable for:

Ward--weeding window boxes.

Greenhouse--patient may sit on stool or stand to weed greenhouse benches, or remain in wheelchair if benches are at convenient height.

Outdoors.

Type of patient--men, women, children.

Recommended for:

Mental patients:

Deteriorated--opportunity to work among interesting plants.

Excited--because of the monotony.

Depressed--when working among bright flowers, or if vegetable gardening appeals to patient.

Epileptic--no tools involved.

Tubercular patients--when patient is well enough to sit up to do light work involving hands and forearms (ward or greenhouse).

General hospital--as soon as patient is able to sit in chair for short periods he can weed window boxes in ward.

Cardiac--one of the least fatiguing of all outdoor gardening activities; weeding greenhouse benches or window boxes while seated is still less fatiguing.

Physical disabilities--good for developing coordination of hands; good for practicing grasp and release; increasing range of motion of flexion and extension of wrist.

Amputation--develop remaining hand and arm; prosthetic training for upper extremity amputation.

Blind--if working among plants that are easily recognized by touch.

Deaf--not handicapped.

Geriatric--may have difficulty stooping or kneeling.

Precautions--watch for allergies and hay fever.

Using hand weeder:

Technique is:

Quieting--through monotony.

Stimulating--through interest in the plants being cultivated.

Monotonous--through repetition of motion; more so if working among plants in rows.

Varied--only through number of plants being cultivated.

Simple--primarily repetition of one motion.

Slow--not as slow as pulling weeds individually, but slower than hoeing.

Adaptable--handle may be built up for patient with weak grasp; weight may be added to increase resistance when raising tool.

Physical processes involved:

Fingers and thumb--statically flexed position in grasping handle.

Elbow--flexion against resistance-flexion.

Shoulder joint--extension; some adduction against resistance; flexion, abduction.

Spine--some lateral flexion and rotation toward hand that is being used.

Hip and knee--extension against resistance; flexion.

Posture--stooped or kneeling when working outdoors; standing or sitting when working in greenhouse; watch for excessive bending

of the spine.

Eye strain--little.

Fatigue--not an important factor; some fatigue of legs and back.

Mental processes involved:

Interest--through interest in the plants being weeded.

Concentration--to avoid injury to the plants being weeded.

Initiative--little; less if garden is planted in rows rather than if plants are set in groups.

Mental capacity of patients:

Normal to high--especially if this is part of a larger project.

Borderline--can do this well.

Low--if plants are large enough to be easily recognized.

Noise involved--little.

Suitable for:

Greenhouse--patients may work seated or standing.

Outdoors.

Type of patient--men, women or children.

Recommended for:

Mental patients:

Deteriorated--particularly if patient was interested in gardens before the onset of his illness; good for helping maintain general physical health.

Excited-through repetition of motion.

Depressed--if working among bright flowers, or if patient

particulary enjoys gardening.

Epileptic--slight danger; make sure the tool is not sharp.

Tubercular patients--work in greenhouse when they are well enough to engage in activities requiring use of upper arm while seated in chair or standing.

Cardiac--comparatively little fatigue involved; especially when working while seated or standing in greenhouse; more strenuous than pulling weeds.

Physical disabilities--may be used to increase range of motion of elbow.

Amputation--developing remaining hand.

Deaf--not handicapped.

Geriatric--may have trouble working in stooped or kneeling position.

Pushing cultivator:

Technique is:

Quieting--outlet for energy.

Stimulating--through the number of different plants being grown; especially if working among bright flowers.

Monotonous--little variety of motion.

Simple--primarily a walking motion.

Moderately rapid.

Physical processes involved:

Fingers and thumb--statically flexed position in grasping handle.

Elbow--flexed position; force is on extensor muscles.

Schoulder joint--flexion against resistance.

Scapula--abduction.

Hip and Knee--extension against resistance; flexion.

Ankle--plantar flexion against resistance.

Posture--essentially erect, somewhat leaning foreward; watch for excessive bending of the spine.

Eye strain--none.

Fatigue--some; frequent rests advisable.

Mental processes involved:

Interest--through interest in the garden as a whole.

Concentration--only to stay between the rows.

Initiative--little.

Mental capacity of patients:

Normal to high--if cultivating is a part of garden project.

Borderline--can do this well.

Low--probably could learn this.

Noise involved--little.

Type of patient--men; some women.

Recommended for:

Mental patients:

Deteriorated--helps maintain general physical health.

Excited--outlet for energy; release for aggression.

Depressed--only if patient especially enjoys this activity.

Tubercular patients--not recommended.

Physical disabilities--strengthen abductors of scapulae, strengthen extensors of hip and knee, strengthen abdominal muscles.

Amputation--gait training; advanced on rough terrain.

Deaf--not handicapped.

Geriatric--not recommended.

Precautions--watch for blisters on hands; watch for fatigue if patient is not accustomed to physical labor.

Planting seeds or bulbs:

Technique is:

Quieting--through monotony of motion; working with dull-colored materials.

Stimulating--through interest in the plants that are to come from the seeds.

Monotonous--if large quantities of the same thing are being planted.

Varied--by the number of species of seeds or bulbs being planted.

Simple--if spaces are marked by someone else.

Complex--different sizes of seeds must be planted different distances apart and covered with different depths of soil.

Slow to moderate--depends on planting distance; accuracy with which work is done.

Adaptable--flats in which seeds are being sown may be placed at height that is best for patient.

Physical processes involved:

Fingers--flexion, extension.

Thumb--opposition.

Wrist--flexion, extension.

Nearly all other motions of hand and arm are involved--none against

resistance; if a hoe is used to open the rows, the action is similar to that of raking; if holes are opened with a trowel, the action is as outlined in "digging with trowel".

Hip and knee--extension against resistance in moving from place to place in stooped position when planting seeds outdoors.

Posture--stooped or bent foreward; stress bending from hips rather than bending spine.

Eye strain--some if working with small seeds.

Fatigue--slight.

Mental processes involved:

Interest--through interest in future results.

Concentration--to follow a planting guide if one has been made; to space seeds or bulbs correctly; to mark each species.

Initiative--if patient plans his own garden.

Mental capacity of patient:

Normal to high--especially if patient is to have full responsibility for garden.

Borderline--may need more detailed instruction.

Low--need considerable supervision.

Noise involved--none

Suitable for:

Bed--a few seeds in a pot of soil; be sure to protect bedding with plastic sheet.

Ward--flats or window boxes.

Greenhouse--starting seedlings in flats to be potted, benched, or planted outdoors.

Outdoors--sowing seeds or planting bulbs where they are to grow; or in a special seed bed for transplanting later.

Type of patient:

Men, women.

Children--may require help opening rows correct depth.

Recommended for:

Mental patients:

Deteriorated--arouses interest in the future, provide activity not possible every day.

Excited--will enjoy this activity, but will be inclined to plant too large an area and to waste seeds.

Depressed--stimulates interest in life and the future.

Epileptic--no tools involved.

Tubercular patients--pushing a few seeds into a pot of soil requires very little effort for the bed patient; planting seeds in flats may be done while seated; outdoor planting of seeds requires little more effort than walking if someone else opens the rows.

General hospital--quick-to-germinate seeds in a pot of soil help time pass quickly for convalescent; use seeds that may be grown on as pot plants for longer term illnesses.

Cardiac--wide range of degree of activity possible; danger of fatigue slight.

Physical disabilities--practice grasp and release; develop coordination of fingers and thumb.

Amputation--develops accuracy in remaining hand.

Blind--use large seeds and spotting board in flat.

Deaf--not handicapped.

Geriatric--stimulates interest in the future; use species that can be grown as pot plants for patients unable to garden outdoors.

Strawberry barrel:

Technique is:

Quieting--because of energy expended in boring holes in barrel and filling barrel with soil.

Stimulating--because of novelty of project.

Monotonous--only the process of boring holes.

Varied--by size of barrel; choice of variety of plant--rock garden plants may be used instead of strawberry plants.

Simple--each step is relatively simple.

Complex--consists of several processes: boring holes; painting if desired; filling with soil; tamping the soil; inserting plants through holes as barrel is being filled.

Slow--boring the holes; other steps are moderately rapid.

Project is:

Inexpensive--if barrel and plants are donated and soil is available on grounds.

Expensive--if all materials must be purchased; addition of fertilizer increases cost.

Useful--for fruit produced.

Ornamental--primarily so, because value of fruit obtained is less than if same number of plants were grown in rows; makes a good focal point in a landscaped garden.

Salable--empty barrel with holes bored might be; filled barrel cannot be moved.

Physical processes involved:

Fingers and thumb--flexed position in grasping handle of brace while boring holes, and handle of shovel while filling barrel with soil.

Forearm--pronation and supination in shoveling soil into barrel.

Elbow--extension against resistance when filling shovel with soil; flexion; extension and flexion against resistance while boring holes.

Shoulder--flexion against resistance when filling shovel and when lifting shovelful to top of barrel; outward and inward rotation in emptying shovel and returning it to position to be filled; some abduction and adduction while boring holes.

Spine--rotation while shoveling.

Hip--some flexion and extension when shoveling soil into barrel.

Posture--essentially standing.

Eye strain--none.

Fatigue--especially while boring holes; if three 1" holes are bored in triangular arrangement, then connected by sawing, the process is less fatiguing, but takes longer than if 2" holes are bored with an expansion bit.

Mental processes involved:

Interest--because of novelty of project.

Concentration--in spacing holes correctly.

Initiative--little.

Mental capacity of patients:

Normal to high--planning spacing of holes.

Low--boring holes; painting the barrel.

Noise involved--some while boring holes.

Suitable for:

Shop--preparing the barrel.

Outdoors--barrel must be filled exactly where it is to stand.

Type of patient:

Men.

Women--caring for established barrel; some might enjoy the entire project.

Children--painting, helping place the plants, caring for barrel after it is planted.

Recommended for:

Mental patients:

Deteriorated--because of novelty; activity of planting barrel good for maintaining general physical health.

Excited--boring holes excellent outlet for aggression.

Depressed--caring for barrel, particularly after plants have begun to show buds.

Epileptic--helping place plants; caring for established barrel.

Tubercular patients--caring for established barrel if patient is ambulatory.

Physical disabilities--strengthen extensors and flexors of elbow; strengthen grasp; increase range of motion of elbow (using brace and bit).

Deaf--not handicapped.

Geriatric--caring for established barrel.

Precautions--watch for blisters on hands; watch for fatigue--use of expansion bit is much harder work than regulation bit; watch for fatigue while filling barrel.

Transplanting seedlings:

Technique is:

Quieting--because of repetition of motion, dull colors of soil and plants.

Stimulating--if patient is particularly interested in plants.

Monotonous--much repetition of motion; plants nearly the sime size.

Simple--each step is relatively simple.

Complex--entire process consists of several steps--filling flats or pots, lifting seedlings, making hole in soil, inserting plant, pressing soil around plant.

Moderately rapid.

Adaptable--by changing position of flats in relation to patient; using small pots for bed patients; flats for shop or greenhouse.

Physical processes involved:

Fingers--flexion, extension.

Thumb--opposition.

Many other movements of upper extremities are involved, but are too diverse to be analyzed.

Posture--standing, seated, propped up in bed.

Eye strain--slight.

Fatigue--not an important factor.

Mental processes involved:

Interest--because of interest in the plants.

Concentration--to space plants properly.

Initiative--little.

Mental capacity of patients:

Normal to high--especially if this is preliminary to outdoor gardening.

Borderline--could do this well.

Low--with some supervision.

Noise involved--none.

Suitable for:

Bed--transplanting plants into small pots; protect bedding with plastic sheet; use plants that may be grown as pot plants indoors.

Shop or greenhouse--transplanting into pots or flats; patient may work seated or standing.

Type of patient--men, women, children.

Recommended for:

Mental patients:

Deteriorated--as one among many activities.

Excited--mildly excited.

Depressed--if patient enjoys working with plants; may be a no-tool project.

Epileptic--need involve no tools; little danger in case of falling.

Tubercular patients--involves primarily hand and forearm movement.

Cardiac--adaptable to patient's activity level.

Physical disabilities--practice grasp and release, flexion of fingers, opposition of thumb.

Blind--possible.

Deaf--not handicapped.

Geriatric--good.

SUMMARY

The use of horticultural skills as a therapy is considered merely one among many occupational activities having therapeutic value.

The purpose of Horticultural Therapy has been the improvement of mental and physical health. Values ascribed to horticulture included combatting sleeplessness, improving appetite, diminishing need for restraints, satisfying procreative instincts, strengthening muscles, regaining work tolerance, and improving morale.

Gardening has been used in hospitals, vocational rehabilitation programs, prisons, and for leisure activity. Horticultural activities have been recommended for the mentally ill, for patients who have recovered from tuberculosis, for those with physical disabilities, for the blind, and for cardiac patients. Farming, outdoor gardening, greenhouse gardening, bedside gardening, and landscape appreciation have been found useful.

Early examples of the use of gardens in the treatment of illness were the temple gardens of early Egypt and Greece. In the eighteenth and nineteenth centuries gardening was used in mental hospitals. At the beginning of the twentieth century there were instances of gardening being used in institutions other than mental hospitals. At that time effort was made to devise activities to supplement those that were necessary to the maintenance of the hospital; outdoor and bedside gardening were mentioned in many books describing suitable activities for the sick.

In the early 1940's "garden therapy" was discussed as a separate type of treatment. The use of gardening during World War II stressed functional treatment much more than had been done previously. Investiga-

tions into the potentialities of the use of horticulture as a therapy were begun at Michigan State College in 1951. At this time much of the impetus for the work in Horticultural Therapy was caused by the interest of garden club members. Phases of horticulture other than outdoor gardening began to recieve more attention than previously.

In order to serve as a pilot study, an exploratory program of Horticultural Therapy was conducted at Kalamazoo State Hospital during July and August of 1955. Gardening was by far the most popular activity. Plant identification appealed to fewer people. Plant propagation was of interest to those who were confined indoors. The study of plant parts and plant functions increased the patients' interest in all phases of horticulture. Flower arranging, corsage making, and related short term projects provided opportunities for creative expression.

Based upon the experience of the pilot study, a suggested program for Occupational Therapists has been outlined in detail describing the types of patients, required facilities, and limitations. Projects have been grouped under the following headings: outdoor gardening, other outdoor projects, indoor gardening, greenhouse gardening, cut flower projects, other indoor projects using plant materials, and related projects.

A brief description of each project has been provided supplying sources of futher information.

Complete analysis of activities involved in outdoor gardening has been included to supply a comprehensive source of current findings in the application of horticulture as a means of therapy.

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APPLICATION OF HORTICULTURE AS A MEANS OF THERAPY

by

Reva Doris Zischke

AN ABSTRACT

Submitted to the School of Graduate Studies of Michigan State University of Agriculture and Applied Science in partial fulfillment of the requirements for the degree of

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ABSTRACT

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