R E P O R T R E S U M E S

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A MOVIGENIC CURRICULUM, AN EXPERIMENTAL APPROACH TO CHILDREN WITH SPECIAL LEARNING DISABILITIES CONDUCTED AT THE LONGFELLOW SCHOOL, MADISON, WISCONSIN, DURING THE 1964-65 SCHOOL YEAR.

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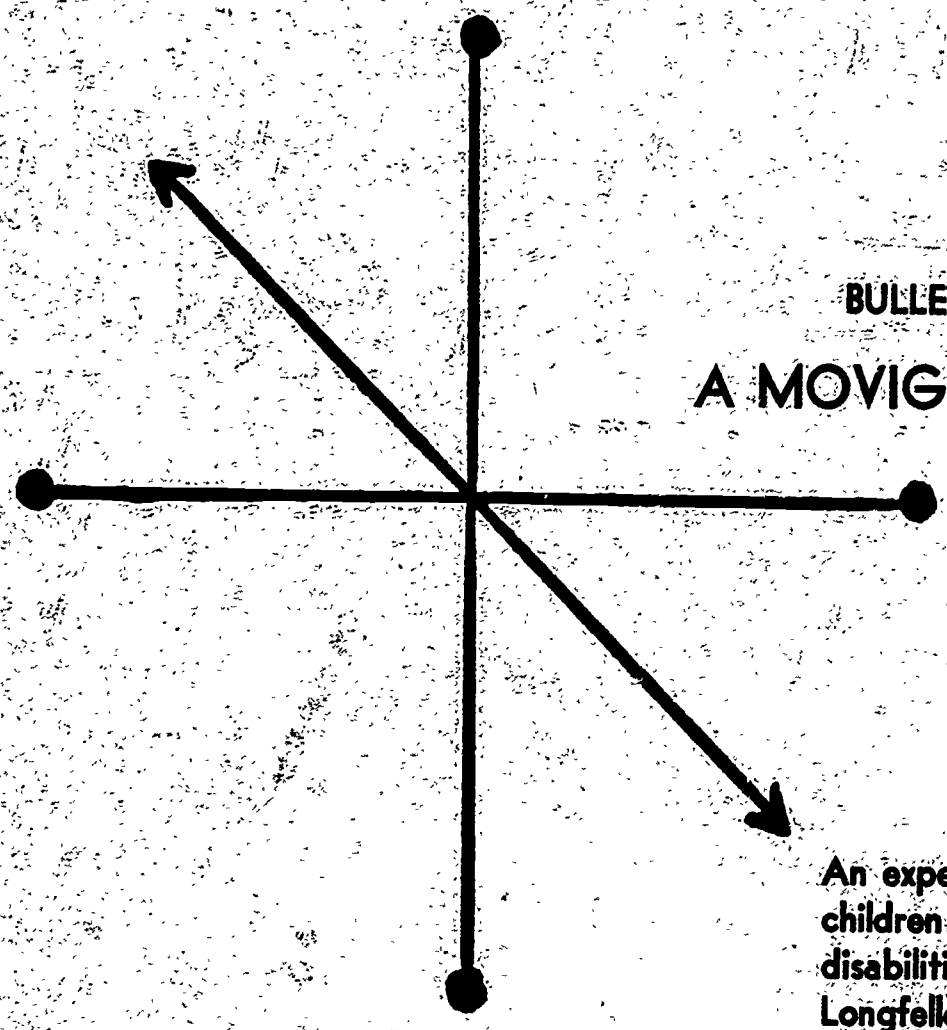
A PHYSIOLOGICAL APPROACH TO THE EDUCATION OF CHILDREN WITH SPECIAL LEARNING DIFFICULTIES WAS THE BASIS OF AN EXPERIMENTAL CURRICULUM. THE LEARNER WAS SEEN AS A SPACIALLY ORIENTED BEING WITH A PHYSIOLOGICAL MAKEUP DESIGNED TO TRAVEL THROUGH "EDUCATIONAL SPACE," PROCESSING INFORMATION TO HIS PROGRESSIVE ADVANTAGE. EIGHT CONSTRUCTS SERVED AS A NUCLEUS FOR A THEORY OF MOVEMENT, AND SPECIAL ACTIVITIES PROGRAMED IN EACH AREA ARE DETAILED. THE MOVIGENIC CURRICULUM IS A SUPPLEMENT TO THE EXISTING CURRICULUM. TWO GROUPS OF SIX ELEMENTARY GRADE, NORMAL ABILITY CHILDREN WITH LEARNING PROBLEMS SPENT 6 HOURS WEEKLY FOR 1 SCHOOL YEAR IN THIS PROGRAM. NINE OF THESE 12 WERE NEUROLOGICALLY IMPAIRED. A THIRD GROUP OF SIX PRESCHOOLERS MET FOR 1/2 YEAR. A PRECISE STUDY OF CHILD CHANGE WAS NOT ATTEMPTED BUT WAS PLANNED AS A LATER, SECOND STAGE. THE FILM "THE MOVIGENIC CURRICULUM," IS AVAILABLE FROM THE BUREAU OF AUDIOVISUAL INSTRUCTION, UNIVERSITY OF WISCONSIN, 1312 WEST JOHNSON ST., MADISON, WISCONSIN. (HJ)



BULLETIN NO. 25

A MOVIGENIC CURRICULUM

An experimental approach to children with special learning disabilities conducted at the Longfellow School, Madison, Wis., during the 1964-65 school year.

This material was developed by
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* A 45 minute black-and-white sound film, *The Movigenic Curriculum,* depicting the various classroom activities involved under the twelve dimensions is available from the Bureau of Audiovisual Instruction, University of Wisconsin, 1312 West Johnson Street, Madison. The film can be loaned for a period of one week to interested groups and/or individuals. Address inquiries to Dr. Maurice T. Iverson, Assistant Professor, BAVI.

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PREFACE

This report recounts the rationale, underlying theory and the specific curriculum employed in an experimental program conducted at the Longfellow School in Madison. It is intended to clarify a particular point of view regarding children with special learning problems.

The theory of Movigenics referred to in this report represents the particular point of view of the author and is the orientation offered in the course sequence offered in the area of preparation for graduate students in Physically Handicapped and Neurologically Impaired at the University of Wisconsin.

The opportunity to bring theory to a practical level of classroom use has been an exciting and challenging experience for everyone associated with the project. It is hoped that the educators who read these pages will find the same kind of excitement and challenge present in this particular orientation.

Ray H. Barsch, Ph.D.

SECTION I
INTRODUCTION

The institution organized by this society to transmit its culture to growing citizens is the school. Through a highly organized program of sequential learning defined in annual intervals and in units of development spread over a twelve to fourteen year period our society acquaints children with all that has gone on before, all that is current, and the promise of what is to come. Despite many variations in content, geographical emphasis or de-emphasis, and divergent approaches, there is a national core curriculum and a national pattern. The school course for every child born today in the United States can be predicted with a high degree of accuracy five to eighteen years hence. Some slight variations may occur but the basic model will remain the same. Thus for every child born a *curriculum demand* may be said to be waiting for him. Beginning at age five or perhaps earlier he will be expected to *meet* that demand. It will be the same for him as for all others enrolled in his class.

Many years of experience have yielded a common finding. Some children in the group will meet demand with ease and continue to advance in a comfortable state of balance. Some will meet the demand only with extra work, long hours, tedious repetition and much encouragement. Still others will fail to meet the demand and fall behind their classmates into a "limbo of expert failuresness." These "limbo" children are those with special learning disabilities.

When such children first give evidence of significant failure the diagnostic forces of the school seek to explain their failure on the basis of poor intelligence, emotional disorder and/or sensory loss. For a certain percentage of these children such simplified explanations do account for their failure and they can be rescued and placed in a climate where learning may be brought to a demand level which they can meet. But what of those who cannot be rescued so easily?

Intelligence tests and teachers' judgments indicate average or above intellectual functioning. While emotional problems are certainly present they have not reached a stage where the child can be classified as emotionally disturbed. Although the children may be regarded as inefficient listeners there is no significant loss in auditory acuity. They may or may not be wearing lenses but the mere presence of an ocular defect does not demand sight conservation techniques. The picture presented by these children becomes even more confusing because they learn some things easily while failing miserably at other tasks. They fit no existing category — so they must become a new category unto themselves — *children with special learning disabilities.*

School authorities in every community are keenly aware of a significant incidence of such children throughout their elementary and secondary class populations. Percentages may vary from one community to another but this general segment of the school population presents a significant challenge to the educator.

The intellectual level of these learners dictates against placement in classes for the retarded. Their general sensory, emotional and physical characteristics contraindicate placement in other types of special classes. For some children in this segment provision of remedial reading services may serve to return them to the mainstream of education "academically repaired" and ready for further progress. For many others, however, the customary remedial services do not produce significant change in performance.

Proper Placement

Children with special learning disabilities present two major problems from a concern for proper placement. Should this child be maintained in his regular classroom participating in the general curriculum for identification, social values and global learning despite his inefficiencies? Should a program of help be offered on a tutorial basis part time excusing him from class for such activity? Should such children be enrolled in a full-time special class designed to meet their needs in the hope that a segregated process would enable them to be returned to the mainstream in another year or so?

The designation of this group as a distinctive entity for school planning is comparatively recent. The body of experience in providing special service is light. Few ground rules have been established. Efforts to formalize programs to meet these needs are still in the early stages of development. In many school systems forma-

lized programs are still in discussion stages. If the educator turns to the experiences of others who have tried he is very likely to find companions in bewilderment. A general survey of the literature will suggest many theoretical points of view but few reports of programs which have been carefully evaluated.

At this point the concept of the child with special learning disabilities is just emerging from behind the clouds of misunderstanding and the image is so unclear that each community must essentially rely upon its own ingenuity. The answers to the questions regarding "proper placement" remain unanswered.

Matter of Curriculum

The second major question related to children with special learning disabilities concerns the matter of curriculum. What approach should be used to resolve their learning failures? Should a program be composed of remedial reading, remedial arithmetic, remedial spelling and remedial writing? Should a program have a strong psychotherapeutic orientation? Should a program be organized on a small group basis thus enabling a teacher to meet bewilderment more directly?

While there is a vast body of literature related to remedial work in reading which may be investigated to define a specific program of activity to improve reading the literature in remedial arithmetic, spelling and writing is minimal. If a school system were to select a remedial subject-oriented approach the emphasis would likely be heavily skewed in the direction of reading. The resolution of such a skewing tendency would require the organization of a remedial curriculum in arithmetic, spelling and writing that would be of equal intensity and range to the reading emphasis. A psychotherapeutic orientation has many positive attributes to recommend it. Most children with special learning disabilities can be regarded as holding a negative concept of self bruised and deflated in a rough journey of school failure. They require ego support in a comfortable setting with an accepting adult in an atmosphere of mutual trust. However, a supportive relationship to be profitable to the child's development would also require some organized approach to academic subjects if return to adequacy is intended. This leads directly back to the remedial concept. The use of current methodology which already has proven unprofitable has little to recommend it. By implication such an approach suggests that the child's failures are primarily due to the inability of the teacher to "tutor him over the obstacles" because of the size of the regular class group.

The question of curriculum is also unanswered. Both major questions facing the educational planner are, therefore, open to debate and discussion. The organization of demonstration programs which formalize a variety of approaches to this problem becomes a necessary first step in building a body of information to provide guidelines for intelligent planning. Pilot programs which clearly define a set of principles for curriculum and activate these principles into an active effort are needed.

Once activated such programs can then be carefully studied, evaluated and refined.

This is the purpose of the experimental curriculum described in the discussion to follow.

SECTION II
RATIONALE FOR THIS PROJECT

The time schedule of the experimental classes was established on the premise that the child of average intelligence with a significant learning problem *belongs* in the mainstream of education for psychological, intellectual and social reasons. Any effort to improve the efficiency of his performance so as to permit him to profit from the mainstream curriculum must be a part-time service. His basic enrollment in regular class must not be prejudiced. If analysis of his difficulties results in findings of inconsistency, poor work habits, poor spatial organization, poor development in certain fundamental reading, arithmetic, spelling and writing skills, failure to complete assignments, behavioral problems of an irritating and minor nature, lack of confidence and a general finding that the child lacks a perceptual organization equal to the demand, then he is likely to actually be gaining more than he is losing. Even though there are many areas of daily classroom demand which he cannot meet as adequately as his classmates, in assessing the totality of performance throughout a given week there is a favorable weighting on the positive side. Such findings indicate that the rightful place of the child is the regular classroom. Other viewpoints are certainly possible. The conviction here is that the proper placement of the child with a special learning problem is in the regular class.

Armed with this conviction two class organizations were devised to operate for two semesters and a third group was initiated during the second semester.

Group I, consisting of six boys meeting on Monday, Wednesday and Friday afternoons for a period of two hours, held 102 sessions for a total of 204 instructional hours from September to June. Group II, consisting of four girls and two boys, met on Tuesday and Thursday mornings for 69 sessions of three hours each for a total of 207 instructional hours. Group III which did not start until March 5, 1965 had six young children enrolled and met for 34 sessions and a total of 68 instructional hours. The third group met on Monday, Wednesday and Friday mornings.

All children continued to attend their regular classes for the remainder of the school week.

The second major consideration was devoted to the question concerning curriculum. In this demonstration project the curriculum issue was classified as the primary one of the two questions. The first question related to enrollment in regular classes was easily resolved by an arbitrary decision to establish a part-time program. Once this decision had been made the question on proper placement was temporarily resolved — at least for this demonstration. The more critical question of the content of the therapeutic program still remained.

A curriculum is a course of activity spanning a period of time and intended to achieve a specific set of objectives. A curriculum for children with specific learning disabilities can have only one objective — to correct whatever impediments stand in the way of the child taking full advantage of the offerings of the regular curriculum.

The Intellectual Approach

In the general history of education two basic approaches seem to have been employed. The first approach and the one which still dominates educational thinking may be classified as the "intellectual approach." In this approach the level of intelligence is regarded as the major criteria for predicting achievement of academic adequacy. Given an adequate measure of intelligence there is an automatic assumption that learning will take place according to the timetable established by the curriculum. Any reduction in intelligence is customarily regarded as a barrier to achievement. Thus children of average intelligence or above average intelligence are expected to conform to standards in reading, spelling, arithmetic and so on. Those who are mentally retarded are *not* expected to achieve according to standards and, therefore, require some reduction in demand. By and large, this must still be regarded as the principle approach to education.

The Psychiatric Emphasis

Within recent years the "psychiatric emphasis" upon the learner as a psychologic being responding to rejections, repressions, hostilities, frustrations, anxieties and other psychic patterns has been introduced as an explanatory note to account for learning failure. There can be no question about the validity of these two approaches.

According to present standards of assessing intelligence there is a certain percentage of children who do not profit from the regular curriculum. This is an established fact which defies contradiction. At the same time, the general understanding of child behavior advanced by a more profound appreciation of defensive mechanisms in response to emotional stress have definitely validated the incidence of children who fail to learn as expected because of emotional problems.

Unfortunately, these two approaches, valid though they be, do not serve to explain the general group of children included under the designation of *special learning disabilities*. On the one hand, these children manifest an adequate level of intelligence to suggest that their failure cannot be accounted for on the basis of reduced intelligence. On the other hand, while some emotional overlay is usually present the emotional problems are not sufficiently severe to attribute the failure to "emotional blocks."

The children themselves have defied the traditional explanations and denied the typical approaches. It is as though the children themselves demand the development of a third approach. If not an intelligence approach and not a psychological approach, what other approach holds some promise for resolving this dilemma?

The Physiologic Approach

It is the contention of this project that the third approach to education can be designated as the "physiologic approach." In broad terms this approach regards the child as a sensory-perceptual-motor organism confronted by a variety of energy forms which somehow must be converted into meaningful systems of information if he is to achieve full efficiency as a learner. The learner is a space oriented being with a physiologic makeup designed to travel through "educational space" processing information to his progressive advantage.

Returning now to the introductory remarks about the *curriculum demand*, a number of observations are in order. The regular curriculum is based upon certain assumptions. The first assumption is that children of average intelligence have become sufficiently successful at processing information by the time they reach six years of age that the composite of such efficiency can now be brought to bear upon comfortable academic achievement. The second assumption bears upon the belief that the typical child-rearing pattern will have provided a sequence of experiences which may serve as a foundation for academic advancement. Given a child from a reasonably intact family, both assumptions are believed to apply when he enters the first grade.

Variations in experience, opportunities to learn, parental emphasis and the general success level are generally felt to simply account for individual difference but to afford no serious obstacle to academic acquisition if adequate levels of intelligence are present. Each of these factors in turn might be held accountable for failure in the culturally deprived child but are rarely considered in the "plain vanilla" child from average parents in an average neighborhood in an average community.

In line with the physiologic approach it is a basic tenet of this theory that such assumptions are invalid. Many children in this society by virtue of variation in experience, differing opportunities, parental emphasis and a variety of minor forms of developmental failure arrive at the school age "unqualified by lack of adequate basic training" to cope with the demands of the curriculum. At age six they have not yet become efficient listeners although their auditory system is intact. They have not become efficient visualizers although their visual systems are healthy and their sight is adequate. They have not learned to appreciate texture for learning even though their hands and bodies have no impairments. They move but do not transport their bodies easily and gracefully as they pursue task after task. In short, despite the presence of a basically adequate physiology the perceptual processes have not been refined to the complex sharpness required for academic efficiency. The basic equipment is there but the five years of basic training to prepare them to meet the curriculum demand have emphasized other objectives than the critical developments necessary for academics.

They fail because their skill level is not adequate to the demand. They fail not from lack of intelligence or presence of significant emotional problems but because they are not ready to meet the demand. Visual processes need refinement. Auditory processes need to be sharpened. Kinesthetic skills must be developed. Tactual skills must be better organized.

The demand cannot be changed. The majority of children meet the demand. The percentage who do not require careful attention to the preparation of a state of physiologic readiness which will equip them to meet the task as comfortably as their peers.

For many years educators have voiced the belief that the "whole child" is the concern of education. The practical expression of that belief, however, has taken the form of judging intellectual adequacy and emotional needs. Another factor is "wholeness" — that of physiologic readiness-must also be incorporated into that belief.

The Curriculum Goal

The goal of the experimental curriculum was, therefore, set to achieve a state of physiologic readiness in the learner to bring the children to a level of total organization which would enable them to profit from the existing curriculum.

Based upon this goal, another objective seemed to naturally emerge from this thinking. In simple terms it was clear that the children had not been able to profit from the *usual* curriculum so the pursuit of a modified usual curriculum held little promise of producing significant change. It seemed clear that an *unusual* curriculum was called for. Unusual was taken to mean the establishment of a sequence of articles which would be different from those which might customarily be offered in a classroom.

Thus, two goals were established — one to utilize a physiological approach and two, to create an unusual set of activities. Such uniqueness required a model. Some theoretical framework which might offer a logical set of constructs and principles was required to offer guidelines to the building of such a curriculum. Movigenic theory offered such a model.

Movigenics, the study of the origin and development of movement patterns leading to learning efficiency, had been ripening over a number of years. Movigenics derived from Rousseau, Itard, Seguin, Montessori, Titchener, Postman, Kaffka, Brunswick, Warner, Wapner, Strauss, and many others, synthesizes the principle learnings in the fields of perception, psychology and education. It incorporates concepts from physiology, physics, biochemistry, anthropology, sociology, speech, occupational and physical therapy, orthopedics, neurology, physical education, audiology, ophthalmology, optometry and endocrinology. This synthesis of many fields into a set of constructs under the heading of movigenics served as the theoretical model for the experimental curriculum.

Movigenic Constructs

The MOVIGENIC curriculum is derived from a series of eight constructs which serve as the nucleus for a theory of movement:

1. All living organisms must survive in an energy surround. Radiant, mechanical and thermal energies represent the primary stimuli sources with which the organism must contend.

2. Survival in such an energy surround is contingent upon movement. The organism must move to survive. If movement cannot occur from independent initiation the organism is at the mercy of the energy forces or dependently reliant upon others for survival.

3. The pull of gravity represents the major force to be resolved by the human organism in developing patterns of movements to promote survival. Independent control of gravitational force represents the most unique conflict confronting the human organism seeking identification in a world of erect walking fellow beings. Building an adequate repertoire of movement patterns for survival in a variable, uncertain energy surround requires walking, crawling, hopping, running, squatting, rolling, etc.

4. Drawing upon the work of Ashby (1960), Taylor (1958), and Harmon (1960), the human organism may be defined as a *"homeostatic, adapting, bilaterally equating, dynamic, multistable system designed as an open energy mechanism so as to promote its survival in an energy surround."*

5. Co-ordination is truly a matter of co-ordinates. Each individual builds a set of geometric co-ordinates within himself according to the patterns with which he learns to control his movement against gravitational pull and to center and align himself in a meaningful relationship to the energy surround in which he lives. Each indi-

vidual resolves this battle in the most comforting manner possible even though this frequently requires that function alters structure and some penalty is accepted in lieu of full co-ordinative efficiency.

6. The terrain of movement is space. Each individual must organize a visual space volume, an auditory space volume, a tactual space volume and a kinesthetic space volume. These four modalities represent the major processing mechanisms utilized by the individual in moving to adapt to progressive daily demands. These are the volumes which must be organized for efficiency in movement. Failure to adequately organize each spatial volume results in some constricting penalty to the survival efficiency of the organism.

7. Movement has survival value to the human organism. When energy forces must be managed, informational data processed and behavior organized in ever increasing complexity, a program devoted to achieving optimal movement holds promise of making a significant contribution to learning efficiency.

8. Communication may be viewed as the expression of one's own "space world" in interchange with others. Various statements incorporated into language patterns may be cited as supporting this view such as, "the way I see it" from "my point of view" "my viewpoint is," and many others of similar nature which suggest that the speaker is expressing a unique perception of his own. Communication then may be thought of as an interchange of "space worlds" between speakers, writer and reader, etc. The space world of an individual at any moment is composed of the totality of experiences available for expression. The manner in which the individual has been able to effectively process, organize and integrate all previous visual, auditory, kinesthetic and tactual information represents his communicative potential. Communication potential then becomes dependent upon the efficiency one holds in processing information from a variety of modality sources. Efficient patterns of movement then become crucial to communicative proficiency.

Using these constructs as a theoretical framework an exhaustive review of the literature in psychology, physiology, sociology, physical education, occupational and physical therapy, orthopedics, neurology, biochemistry, anthropology, physics, engineering and architecture was undertaken to ascertain a set of dimensions pertaining to human function and learning which represented labels most frequently associated with efficiency in performance.

From this review 12 dimensions emerged as being most emphasized in the literature and cross-disciplinary analysis indicated that these 12 dimensions might serve as areas of developmental concern in building a unique curriculum.

Postural-Transport Orientations

Muscular strength, dynamic balance, spatial awareness, and body awareness were grouped together in a natural synthesis under the heading of *POSTURAL-TRANSPORT ORIENTATIONS.*

These four dimensions serve to support and direct the movements of an individual in purposeful, meaningful and significant interactions with his environment. *MUSCULAR STRENGTH* is vital to proper support of body weight and to initiate appropriate thrusting and counterthrusting movements of body segments for rolling, crawling, sitting, walking, jumping, pushing, pulling, lifting, etc. *DYNAMIC BALANCE* is necessary for efficient movement through space to provide for a state of least strain and minimum expenditure of energy, resulting in maximum comfort. Both sides of a bilaterally symmetrical body must be brought into a harmonious reciprocal relationship in the conquest of gravitational pull to insure efficient movements on the vertical, horizontal and depth axes. Muscular strength and dynamic balance may be viewed as the two principal ingredients in bringing the child to a state of "readiness to move" and the major supporting mechanisms to all future movements. Next in order the organism must become *aware of itself* and this general concept of BODY AWARENESS has been extensively discussed in psychological literature under the variable semantics of "self-concept," "body image," "the emergent self," "self-actualization" and many other terms. Contained in all of these variations is the same underlying theme of achieving a state of personal awareness that allows an individual to answer to himself on the question of, "Who *am* I?" Being ready to move with sufficient strength and in

a state of comfortable equilibrium with a consciousness of self he must then begin to answer the multitude of questions concerning the "whereness" in his world. He must learn where *he* is and where the entire world outside of himself is located. To answer the question of "whereness" with efficiency he must acquire an awareness of space. He must now organize and move with security and efficiency to inspect, manipulate and modify the world in front of and behind him, above and below him and to either side. He integrates muscular strength to insure proper support for body balance with an awareness of self and labeling and SPATIAL AWARENESS of objects, places, positions and distances into a basic formation of POSTURE to move himself and things according to his own needs and desires and in conformity to developmental demands placed upon him.

Percepto-Cognitive Modes

Simultaneously, other forces are in progressive stages of development to refine and enrich the child's patterns of movements designed to bring the "whoness, whatness and whereness" in his world into a progressive synthesis of meaning. The human organism is designed to process information, and to accomplish this information processing four major channels of input and out-put are available. The entire cutaneous surface of his body may receive and send information about heat, cold, pain, texture, contour, shape, etc., in an ever-increasing complexity. The totality of an integrated system of information processing through the cutaneous surface is designated as TACTUAL DYNAMICS. In order that he might move himself with efficiency in resolving the daily demands placed upon him he must achieve an understanding of how to position himself for performance, how to remember from time the proprioceptive union of muscle patterning to achieve a similar response — he must acquire a "feeling for movement" or a "sensing of correctness" in his patterning. This synthesis of perception and cognition of physical movement patterning is designated as KINESTHESIA.

The vast world of sound must be organized spatially into backgrounds and foregrounds, localized for source and relationship and eventually incorporated into a symbolic system for communication with others. He must become a listener and a speaker. He must both receive and send. The integration of the reception of sound and symbols and the expression of sound and symbols into a reciprocating synthesis of efficient management of acoustic energy has been termed AUDITORY DYNAMICS to establish its inclusiveness. VISUAL DYNAMICS is the term employed to describe the totality of performance initiated by light falling upon the retina. Vision is used to steer the body in its movements in space, to define the limits of surroundings, to describe the contours, edges, reliefs and distances of objects in space. Vision defines the details of a task, the relationship of those details to one another and the task's relationship of those details to one another and the task's relationship with other significant tasks. Vision defines distance, color, relationships, textures — and becomes the true integrating agent for touch, kinesthesia and audition.

The four modes, TACTUAL DYNAMICS, KINESTHESIA, AUDITORY DYNAMICS and VISUAL DYNAMICS are designated as the PERCEPTO-COGNITIVE MODES which serve to bring meaningful information to the moving organism. Working harmoniously with the POSTURAL ORIENTATIONS the PERCEPTO-COGNITIVE MODES enrich the performance efficiency of the learner by providing the intellectual mechanics for discriminations of differences, identification of similarities, building of concepts, development of generalizations and unification of intelligence.

It is as though the POSTURAL-TRANSPORT ORIENTATIONS serve as a pencil sketch outline for a portrait of MOVEMENT and the PERCEPTO-COGNITIVE MODES fill in hue, nuance, contour, texture, etc., giving body, depth and solidity to the portrait.

PERCEPTO-COGNITIVE MODES are functional channels of reception and expression and should not be thought of as senses. Each mode has a sensory counterpart. The sense of sight is the counterpart of vision. Hearing is the counterpart of audition. Muscle contraction and relaxation are sensory to kinesthesia and touch is sensory to tactuality. Senses are defined in terms of acuity, stimulable surface, intactness, neural connections, absence or presence of disease. Modes are defined in terms of information processing, discriminations, generalizations, and conceptual integrations. The measurement of sensory acuity is mechanically and physically quantitative, the measurement of perception and cognition is symbolically and psychologically quantitative. Sensory loss or de-

privation may perturb or reduce intake but does not totally incapacitate perceptual function in any area. The blind child must still build a visual world of perception for full efficiency. The deaf child must still learn to perceive a world of sound if he is to fully integrate his experiences. It is the functional efficiency of these four modes for perception and cognition which concern us in building movement efficiency. These modes must obtain proper information to hold the organism in balance and maintain the development of greater and greater sophistication in resolving developmental demands.

The Degrees of Freedom

The final four dimensions are entitled the DEGREES OF FREEDOM and represent those factors which enlarge, enhance, enrich, expand and explicate the performance efficiency of all others. BILATERALITY is the inclusive term assigned to the efficient movement patterns on both sides of the body. By design the human organism is a symmetrical bilateral equation. He is intended to be binocular, bimanual, bipedal, etc. Two sides are designed to reciprocally interweave, to exchange information, compile data, synthesize and interpret findings and to bring the organism to a unity of performance. Efficient movement is RHYTHMIC with synchronized patterns of accentuation and emphasis. Proper timing of movements of upper and lower extremities is essential to grace and agility. FLEXIBILITY designates the building of a repertoire of responses which allow for immediate modification of performance in keeping with the demands of a given task. This permits adjustments of speed, direction, force and time in variables appropriate to the situation. This factor incorporates the concept of "range" in performance potential. MOTOR PLANNING is the final dimension. The ability to plan one's movements in advance involves a multiplicity of performances including perceptual appraisal, kinesthetic categorizing and planned sequences of balances brought into a synthesis of movement *before* performance.

These four Degrees of Freedom when fully developed contribute to exceptionally high levels of performance skills. These four qualities are present in their highest degree among those performers who reach the position of "star" or "pro," who thrill spectators with their grace, poise, agility, speed, dexterity and finesse. They move with ease and security. The concept also must be broadened so as to ascertain the presence of these degrees of freedom in outstanding statesmen, authors, composers, corporation executives, community leaders and philosophers.

These are twelve dimensions employed in developing the MOVIGENIC CURRICULUM. Through a planned program of activity the child with the problem in learning receives an opportunity to explore and experience himself in space and is helped to integrate his experiences into progressively more complex relationships.

Translation to a Public School Setting

Movigenic theory has been in a progressive state of emergence for many years. The present series of constructs predates this experimental program by approximately four years. In its progressive state it served as a therapeutic model for the development and operation of a highly effective clinical program in a private agency. Most of its constructs have been successfully applied in clinical practice over a period of fifteen years in a clinical setting serving all types of child disability. The private setting was devoted to psychological and educational service to handicapped children and their parents. These constructs were successfully applied to the amelioration of psychological and educational problems among a wide variety of disability groups ranging from two to fifteen years of age.

The concepts have proven effective in individual therapy in a private agency but little opportunity had been available to explore their use in group processes. Despite their proven clinical value the development of similar practices for group use in a public school setting had not been attempted.

Consequently, the translation of individually oriented techniques to group practices became the major challenge of the Movigenic Curriculum. If the constructs of Movigenic theory are logical and valid there must be an equal applicability whether one deals with an individual learner or a group of learners.

Fortunately, the Special Education Division of the Madison Schools and the Bureau for Handicapped Children saw some potential in this approach and supported the development of the project.

To establish the identity of the MOVIGENIC CURRICULUM as the experimental focus several decisions were made prior to the first day of school which have bearing upon the evalua-

tion criteria for judging the values of the program.

1. Since no teachers had yet been trained in the use of this approach the experimental teachers employed for the project were newcomers to the concepts of Movigenics and received only a brief orientation to the general project goals before meeting the children. The four teachers who participated in the experiment were competent and efficient teachers with elementary school experience ranging from six to twelve years. All were graduate students in the Department of Counseling and Behavioral Studies at the University of Wisconsin, working towards advanced degrees.

Criteria for Inclusion

2. The selection of children became the sole responsibility of personnel from the Special Education Division of the Madison Schools. Project staff did not participate in selection. Five basic criteria were predefined to guide this selection.

   (a) Measured or presumed average intelligence

   (b) Significant retardation in two or more academic areas

   (c) Diagnosed or presumed neurologic impairment

   (d) Willingness of the child's elementary school teacher and principal to continue the regular enrollment despite the hours of absence

   (e) Solution of the transportation problem to and from the experimental class with return to the regular school.

The criteria were loosely applied since their principal purpose was to serve as a guideline and not as a set of *excluding* characteristics. It must be remembered that the experimental focus was on the curriculum and only secondarily upon the children. The curriculum was not planned for neurologically impaired children although nine of the children had been so diagnosed. The diagnosis or presumption of neurologic impairment was regarded as a statement of medical fact. The educational fact that the children had learning problems was considered the more significant of the two.

The original selection yielded twelve children who were arbitrarily divided into two groups according to age. No other grouping criteria were employed.

3. No program of pretesting was conducted. The children's school records were not actually inspected until the project had been underway for several months. No demands were made for physical examinations, visual or auditory testing, neurological study and so on. A very brief time was devoted to a scattered number of motor tests on the first day for each child but these were not given uniformly to each child nor were these scored numerically.

Thus was the program initiated, (1) with two competent but methodologically u n t r a i n e d teachers who had no specific plan to follow except as it was devised daily, (2) with twelve untested children having practically no homogeneous characteristics other than presumed average intelligence, significant academic failures and cooperative teachers and principals and finally (3) a curriculum sketched in the boundaries of Movigenic theory but not clearly defined in day by day activities.

A room in Longfellow School, enthusiastic teachers, cooperative and interested school authorities, twelve bewildered children, a theory and an idea were the ingredients of the project all united to provide a unique learning experience.

SECTION III
UNIQUE FEATURES OF THE PROJECT

Physical Organization of the Classroom

No remodeling effort was made. Cabinets, doors, chalkboards and shelving remained as designed. All desks were removed and all books and workbooks were also removed. The general intent was to provide an open space for program use.

The entire bank of windows along the east side of the room and both door-glass panes were covered with a black plastic sheeting to block out all natural light. This enabled the teachers to program certain activities in total darkness. For most activity the overhead lighting was used with no boosting of power. This black-out process created an aura of privacy for the class. The black-out screening was intended for spatial awareness in the dark but an additional unplanned value emerged. The children began to view the setting as a place "of their own" where they were "free to fail without stigma or ridicule."

Chalkboard positions were marked in three foot squares. The mid-point on the floor was marked and a large circle enclosed by a large square were measured and marked on the floor. Initially these were defined by red-yellow and blue masking tape but this proved unsatisfactory and the tape was replaced by painted lines of the same colors. These lines were used to define transport routes and to position children for activities.

A thirty-six inch wide strip of solid green carpeting was stretched across the north end of the classroom to provide a crawling and rolling surface.

In a variety of places horizontal and vertical line targets were pasted in strategic positions to serve as visual targets for alignment.

The teacher's desk remained in the classroom but was constantly shifted to an "out-of-the-way" space. The desk served primarily as a storage space for papers, chalk, pencils, etc. At no time was the desk used as an orientation point for the teacher or the children.

Positions and Surfaces

The child's relationship to gravity in finding a position of comfortable balance was explored by arranging activities in such a manner as to require the child to lie on the floor on his back (supine) or on his stomach (prone), to kneel, sit on the floor, maintain an erect walking position and work while seated on a small chair at a table. All positions were included in each classroom session.

To explore all types of spatial relationships numbers, words and figures were experienced in correct alignment, reversed, inverted, written in air with both hands, traced on the floor by foot, walked or crawled in configurations on the floor, traced with flashlight beams in the dark and so on. All surfaces within the room were used to project stimuli or topperform. All four walls, ceiling and floor were used as learning surfaces.

Children removed their shoes upon entry into the classroom and participated in all class sessions in stocking-feet or barefooted.

Whenever it was possible to do so a given segment of information was experienced by the child with one eye, then the other, both eyes; one ear, then the other, both ears; one hand, then the other, bilaterally; one leg or foot, then the other and both legs and the total body. It was felt that teaching a concept to all parts of the child in varying spatial relationships would serve to "incorporate" the concept and insure retention and integration.

Clothing

The attire of the children and the teachers also served to identify the difference and the novelty of the program.

The three experimental teachers wore black slacks and white blouses during the early portion of the year and changed to multi-colored slack apparel as the year went on. Since the teacher was to be "mobile" and a "participant" her apparel had to suit the demands of her role. Teachers crawled, rolled, jumped, sat on the floor, walked the rails, reclined and performed all of the exercises either in unison with the group or by way of demonstration. The teacher's position was defined as always "with the children."

The girls in the classes also wore slacks and the boys dressed appropriately for the type of program being presented. Those children who attended regular classes before coming to the experimental group or who would go to regular class in the afternoon brought clothing changes with them.

Approach Alternatives

In the planning process to determine specific approaches to individual problem areas two alternatives were possible. One alternative can be identified as "diagnostically oriented," representing an orientation based upon defining precise problem areas in each child and seeking to program learning experiences directly calculated to improve an area of diagnosed need. This approach requires the teacher to be "test-oriented," (i.e., each activity is actually a test for the child to determine adequacy or inadequacy per performance). Based upon the analysis of this "test" the teacher then seeks to find a way to correct the specific inadequacy. This approach is a clinical approach and of necessity is individually oriented. It was felt that such an approach would be ideal for a tutorial relationship but would present many problems in a group situation. The diagnostic-clinical approach would in effect necessitate an individual curriculum for each child with an obvious loss to the group process.

A curriculum based upon group performance throughout the year seemed more acceptable to achieve goals which had been established. This required the adoption of the second alternative — to utilize an "intersensory apprenticeship" orientation. In this approach all children were exposed to all activities and the performance was accepted at whatever level it could be given. Over a period of two semesters each child had countless opportunities to explore his performances visually, auditorially, kinesthetically and tactually. In the group process the activity was the same for all and each child was allowed to perform within that activity at the best level he could manage. Since an essential ingredient in MOVIGENIC theory is the conviction that all channels are interrelated, interdependent and mutually supportive, a gradual refinement in performance was anticipated from such a program of multiple-bombardment.

At no point during the year were individual variations in levels of performance adequacy comparatively noted for the children. No child was identified as "the best" in any activity or "better than." All comments on performance were made in regard to the child's improvement over his own previous performance. Each child served as his own control for performance change. Although some of the children verbalized comments about others being better or poorer in a given performance than they, such remarks were ignored by the teachers or deftly converted to a self-evaluation of improvement for the child who made the comment.

The "intersensory apprenticeship" concept allowed teachers to plan *group* activities throughout the year. It also served to reduce teacher anxiety over specific inadequacies and to place full confidence in the totality of the curriculum as a means for producing changes. If a given child performed poorly in an event there was no compulsion to restructure the event to bring it to his level but rather an acceptance that performance on that event would progressively improve as the child enlarged his performance potential in many other areas. The general results of the program vindicated the choice of the "intersensory apprenticeship" approach over the "diagnostic-clinical" approach.

Flexible Structure

The general program operated as a loose flexible structure with no effort being made to define a chronological order of events or a particular position or place for activity. While the teacher carefully organized each lesson plan the children could not predict a regular order of events. The goal of this type of flexible semi-structured program was to bring the children to a point where they could program for themselves according to their personally defined areas of need. Some headway was made toward self-programming but the goal was not truly achieved.

Dark Time

During each class session the room was placed in complete darkness for a period of time. At first the periods of total darkness were limited to a few minutes but once the children became accustomed to "dark" time as a regular part of the program the period was increased to 10 - 20 minutes.

Darkness was used to close in space and to establish an atmosphere of quietude. Flashlight tracking with each child controlling his own

light space was one of the programmed activities during this period. Verbal descriptions of events, objects or places were given by the teacher to help children build visual imagery. Mood music recordings were played during this period. Individual children described "word pictures" in the dark. Various sound stimuli were introduced for identification and at times the children simply remained quiet listening for environmental sounds from within the school building and the streets below.

Children reclined on the floor during this time and by various techniques the teacher attempted to achieve a state of relaxation for each child. It was initially organized as a rest period, then became a "dark" activity period and finally became a period in which to teach conscious relaxation.

Observation Booth

Throughout the year many people expressed the desire to observe the classes in "action." Some guests did observe from time to time by sitting within the classroom. This was always disturbing to the children's program response. To avoid disturbing the children and to answer these visitation requests a small observation booth was built into one corner of the classroom. This "large box" was introduced into the room adjacent to the north doorway after the Easter recess. It proved to be quite a distraction for the children during the first week but was gradually assimilated as a standard part of the classroom. This provided facility to accommodate observers. During the year about 60 people observed one or more of the classes as individual observers in groups of two or three. Ninety percent of these observers were professionals. Others were interested lay people of the community.

The observation booth also made it possible to arrange a regular schedule of observations for those mothers whose children were participating. This experience proved a valuable asset to the parent counseling program.

Parent Counseling

A cooperative working relationship with the Dane County Mental Health Center and the Special Education Division of the Madison Schools brought about the inauguration of a parent counseling program during the second semester.

Miss Sydney Auer, Psychologist on the Mental Health Center Staff, was graciously "loaned" to the project for one semester and Dr. Myron Seeman, Chief Psychologist of the schools, added to his schedule by accepting half of the parent counseling responsibility. Parents were invited to participate in these sessions on a regular basis. Miss Auer met with one group of mothers on Tuesday mornings, sometimes at her office in the Mental Health Center and sometimes at the Longfellow School. Dr. Seeman met with another group on alternate Thursday evenings in the School Board Offices. This group was composed of several parent couples.

The division into two parent groups did not follow the same lines as the child group but was based upon convenient times for both the parents and the staff.

The integration of the parent into the general program via the counseling groups was felt to be a vital part of the total project. This process enabled parents to discuss their child's progress, their own anxieties and concerns for the future and to learn methods by which they might enhance the child's learning in the home situation.

The observation periods of the children in action were then discussed in the group sessions and the parent counselors helped the parents to understand the implications of their observations.

Liaison

The coordination of the prescribed communication patterns among experimental teachers, regular classroom teachers, principals, parents, Madison schools' central offices and the University was managed by Mrs. Margaret Rieman, Project Assistant to Dr. Barsch.

Weekly Conferences

The experimental teachers met with Dr. Barsch and Mrs. Rieman for approximately three hours each Monday morning throughout the year. The meetings were devoted to discussion and evaluation of child performance, planning innovations for the coming week, evaluation of the progress of the curriculum, demonstrations of new pieces of equipment and the exploration of new ideas.

Introduction of Curriculum Items*

One of the major devices in building the curriculum was the introduction of a new activity or piece of equipment during the first class session of each week. This procedure was deliberately selected as a technique for expanding and enlarging the performance repertoire of the children and to establish a regular time for presenting new materials.

The following list of items or activities was introduced in order on a weekly basis to accomplish these goals:

1. Tachistoscopic presentation of geometric form slides
2. The Harmon walking rails and jump board
3. A set of Maico "train-ear" equipment
4. A suspended plastic ball for visual tracking
5. A set of bells of Sarna arranged as wristlets
6. Plastic templates for chalkboard activities
7. School Skill Tracing boards with tilted surface
8. Mounted 2 x 4 balancing rails in bright colors
9. Teeter boards of different sizes and complexities
10. Scooter boards for prone transport
11. Ink-marking pencils for graphic work
12. A dance tom-tom for rhythm activities
13. Plastic balls of various sizes
14. Teacher intern (adding another adult)
15. A metronome with blinking light
16. Paired movement activities (for children to perform activities requiring pairs)
17. Dark time (placing the room in total darkness for relaxation)
18. Flashlights (for beam activities in the dark)
19. Paper cups fashioned into earphones to vary sound intake
20. A geometric symbol system for reading
21. Plastic geometric forms to accompany charted symbol system
22. Cuisinaire rods for number work
23. Child instruction (one child instructing another)
24. Individual templates for desk-top use
25. Stereoscope
26. Tape recorder
27. Outdoor activities

Each activity, item or procedure was introduced to serve as a stepping stone to other activities. Each became the beginning of a sequence allowing for its incorporation into the program in an ever-widening program. For example, when the teeter boards for balancing were first introduced the children explored their use in whatever way they chose but once introduced the teeter boards were regularly used to develop more and more complex activities reaching a point where each child in the group could maintain balance on a teeter board while playing catch with bean bags or a rubber ball. Each item was programmed from simple performance to complex activity interrelating each performance with one or more other modalities or dimensions.

* For specific information on the dimensions of certain items the reader is requested to contact Dr. Barsch of the Department of Counseling and Behavioral Studies, University of Wisconsin, Madison.

Teaching Intern

At the beginning of the second semester another graduate student from the Department of Counseling and Behavioral Studies was added to the teaching staff to function assistively to the two existing groups. This teacher was also an experienced elementary school specialist working toward an advanced degree in Special Education.

The introduction of a second teacher into each group proved to be of great value to the program. Individual children could be singled out for special work or the two teachers could divide the group for certain activities. This addition provided the opportunity to study a "team teaching concept" in this area.

SECTION IV
THE TWELVE DIMENSIONS

Twelve dimensions were defined to guide the planning of the curriculum. Forms were devised to assist in teacher positions to be planned for in every session. Six positions were selected for use throughout the year — recumbent, kneeling, standing, walking, seated on the floor and seated at a table. The remainder of the lesson planning page was made up of squares in which teachers could write in their planned activities. Across the top of the page space was arranged to write the name of the dimensions being developed during the lesson. For example, under DYNAMIC BALANCE the teacher planned for one balance activity in a recumbent position, one in a kneeling position, one sitting on the floor and so on. Teachers planned such a series for each of the twelve dimensions.

The first two weeks of the curriculum were devoted to programming special activities to test and stimulate the four primary dimensions: Muscular Strength, Dynamic Balance, Spatial Awareness and Body Awareness. This period was used to inaugurate the Krauss-Weber series of exercises, acquaint the children with the use of walking rails, jump boards, and various group procedures for conducting spatial exercises.

The next two weeks emphasized Visual, Auditory, Kinesthetic and Tactual experiences. The activities were again organized primarily to introduce the children to the various pieces of equipment and procedures in each modality sequence. In this time the tachistoscope, the trainear, the crawling and rolling rug, etc. were all presented.

The final two weeks of the Introductory period were given over to experiences in Bilaterality, Rhythm, Flexibility and Motor Planning. Here the bilateral routines at the chalkboard, the metronome, tom-tom, record player, obstacle course, etc. were established as routines within the program.

Essentially this allowed for a six-week period for the children to become acquainted with the teacher, their new classmates, all strange pieces of equipment, new procedures and the "basic organization" of their program in this new setting.

Each week after the Introductory period the daily activity program consisted of activities designed to unite two or more of the twelve dimensions into program units so that all twelve dimensions were covered each week in varying combinations with one another. In addition to this planned interweaving process which was carefully executed by the teacher in each group, one new major novelty was introduced each week. In the weeks that followed the Introductory period, scooter boards, templates, tachistoscopic slide series, teeter boards, school skill tracing boards, and many other pieces described elsewhere were systematically scheduled for the first class period of each week. This practice was continued until the Easter recess.

By design the two semester program was divided into two major areas of concern. The first semester was devoted to the establishment and refinement of basic patterns of movement with no effort to incorporate symbolic functioning into the program. The second semester introduced symbolic processes into the daily class activities and concentrated upon symbol systems for reading and arithmetic. The general procedure in developing and presenting these symbol systems is described in another section of this report.

Each of the twelve dimensions are defined and discussed on the pages to follow — with a brief listing of the activities which were programmed in each area.

Dimension I — Muscular Strength

Definition: The capacity of the organism to maintain an adequate state of muscle tonus, power and stamina to meet the daily demands appropriate to his body size and chronologic age.

Discussion: Anti-gravity muscles must be strong and active to support body weight in various positions against the force of gravity and to maintain an adequate alignment of the body as it moves through space. Ordinary demands for pulling, pushing, and lifting, with legs, arms and trunk normally expected to be managed by the child should be within the developed level of the child. The major muscle systems and groups should be organized to allow the child to effectively distribute his body

weight in a thrusting and counterthrusting pattern for walking and running. Strength to exert force for jumping, kicking, hopping, rolling, crawling, and so on must be adequately established to support such movements. The minor muscle groups used in the control of fine patterns of coordination must be organized and available for use in writing, buttoning, tying, throwing, grasping and so on.

The intent of activities set within the framework of this dimension was to provide opportunities to improve muscle tone through regular exercises, build a basic pattern of strength in exercises described as minimal physical fitness standards and most important of all to help the children learn to utilize their muscle power appropriately and efficiently in the management of their daily problems. Proper positions of the body for using leg muscles for jumping, proper use of muscles within the shoulder girdle for lifting, thrusting, balancing and so on, were stressed throughout the year.

Activities: The following general activities were included in programming to develop muscular strength:

Krauss-Weber exercise series
Tug o' war
Various isotonic exercises
Recordings of exercise directions
Tension and relaxation alternation
Carrying weights of varying size
Isometric exercises
Pushing and pulling activities
Vertical jump extensions
Standing broad jump
Lift and carry exercises
Partner alternation series
(For a more detailed description of specific activities see Appendix I.)

Initial Problem

The majority of the group were unable to perform the basic physical fitness exercises and would generally fall into the classification of immature in terms of muscular strength. Several of the boys appeared to have adequate strength but were not able to marshal that strength in a coordinated performance. Problems of control in both the gross and fine movement patterns were apparent in all of these children. Each in some manner indicated an awareness of these deficiencies and expressed an eagerness to become "stronger."

Summary of Results

The children enjoyed the exercises and soon reached a level of competency in the basic physical fitness series. Better control of muscle patterning was obvious in all performance areas. The children talked of "getting stronger" and were actually able to sustain movement activities for a longer period of time as the semester continued. The most notable changes occurred in the development of grip strength observed in increased ability to pull, grasp, hold and so on. The basic patterns of fitness were established for all children and all benefited from this set of activities.

Dimension II — Dynamic Balance

Definition: Dynamic balance is the capacity of the organism to activate antigravity muscles in proper relationship to one another against the force of gravitational pull to maintain alignment, sustain his transport pattern and aid in recovery.

Discussion: The human body is a bilateral equation with two organismic halves designed to be related to each other through a system of reciprocal interweaving. By balancing the thrusting and counterthrusting of various segments of the body the human sustains a controlled balance against the forces of gravity. In this dimension there is concern for the concept of *gravitational center* and the system of the three axes of coordination. The individual, to move with efficiency, ease and comfort must maintain an appropriate vertical alignment, a reciprocating horizontal relationship and a balanced relationship to gravity to move himself on the "z axis" forward and backward. Balance is dependent upon the management of the gravitational center.

Shifting body weight in a pattern of equalized distribution is necessary for a balanced gait. Rising from a chair, landing from a jump, walking a rail, bending the body forward at the waist are some examples of the need for dynamic balance. It is natural for the individual to always find the best balance possible. This is the principle of homeostasis which has long been recognized as the constant quest of the human. Seeking balance man chooses alternatives, makes decisions, selects and pursues goals,

approaches and avoids. Any form of stress may temporarily produce a state of imbalance which activates man's desire to regain balance. On a purely physical basis balance may be disturbed at any time that the individual moves out of the base of gravity or becomes malaligned on the vertical, horizontal or depth axes. On a physiological basis balance may be disturbed by disease or illness.

Psychological balance is disturbed by stresses of daily anxieties which cannot be readily resolved. Social balance may be upset by a variety of problems among peoples.

Dynamic balance not only refers to the physical but also to the physiological, psychological and social. Dynamic balance begins for the individual during his earliest encounters with gravitational pull when he makes his first efforts to move himself through space by creeping and walking. All children except those with specific neuromuscular handicap achieve erect locomotion according to varying timetables and thereby achieve some degree of dynamic balance but many children appear awkward and clumsy in their play or ordinary walking and running through space because they are easily thrown "off-balance" by slight disturbances in terrain, inclines, declines and so on. For some it appears that they stumble over a pin on the floor or that a slight wind or push will topple them.

Achieving balance depends upon building a composite of proper functioning of the semicircular canals, appropriate use of vision in steering and guiding movement to hold alignment, the development of a kinesthetic awareness and a tactual awareness of surface contact. All four ingredients are necessary for balance.

Experiences which teach children to visually steer and guide their movement is one form of contribution to better balance. Making children more aware of surface textures and the feeling of their bodies in various positions is another method for helping balance. To do this, activities were offered which *always* demanded visual targeting while attempting to balance. Secondly, the opportunity to experiment with varying degrees of imbalance helped the children to find ways of using their anti-gravity muscles, kinesthetic sense, tactuality and vision to establish balance.

Activities: The following list of equipment and activities was offered on a regular basis to help the children achieve competence in this dimension:

Walking rails with tilted sideboards
Skipping, hopping, jumping on geometric form designs
"Purposeful" falling
Teeter boards of various degrees of difficulty
Mimicry of "animal" gaits
Harmon jump board
Moving in a dark room
Prone balancing on a walking rail
2" x 4" walking rails of varying lengths
Twisting, turning and spinning activities

(For a detailed description of some of these activities see Appendix I.)

Initial Problems

This was an area of real difficulty for all of the children. They could not manage the walking, teeter boards, one-footed balance, jump and land in balance, and so on. Any activity which demanded any stress on dynamic balance quickly revealed an awkwardness and clumsiness which was very frustrating to them. Their early encounters with activities in this area marked this as one of the most significant problems to be resolved.

Summary of Results

Significant improvement in balance occurred for all but one of the children. Most became very proficient in maintaining balance on a teeter board to the point where they could hold balance and play catch with a volleyball, change from standing to sitting position without losing balance, hold balance against mild thrusting against their bodies and so on. Righting reflexes in the feet activated by the Harmon walking rail seemed to improve their "sure footedness" in general movement. These improvements in general balance are regarded as having been among the major gains in this program. Children became aware of "balance" and learned to "find balance" for themselves as they moved.

Dimension III — Spatial Awareness

Definition: Spatial awareness is the capacity of the organism to identify his own position in space relative to his surround with con-

stant orientation to surface, elevation, periphery, back and front.

Discussion: In the study of Movigenics space is considered as a surrounding that is a constant for the individual. The physical boundaries of that surround may vary according to site, enclosure, perspective and so on but the constancy remains. The individual always serves as his own orientation point in space and the awareness of space progresses from the proximal point of the individual local to the distal point of infinity. Along the line of that proximal-distal progression four segments may be defined. The spatial surround marked by the full extension of both arms in all planes and all directions is classified as *near space* marking off a schematic two foot space in front, back, above, downward and laterally. *Midspace* is considered a surround extending from 2 - 12 feet in all planes and directions. The distance from 12 - 20 feet is designated as *for space* and all distances beyond 20 feet are included in the classification scheme as *remote* space.

In space orientation the three coordinates of movement again become important. The vertical axis denotes the continuum of up and down and top and bottom space in all four spatial segments. The horizontal axis serves as the orientation coordinate for side space while the depth axis marks off the line of front and back space. Spatial orientation then becomes a matter of holding an awareness of one's own position as the *coordinator* of space for all personal transactions and all events, objects, surfaces and contours which exist and occur within any and all of the four segments. Through a process of organizing a coordinate system within one's self the individual aligns himself with that space and develops a method of centering himself in appropriate positions in relation to events and objects.

Each of the four segments, near, mid, far and remote space radiate from the individual focus. As the individual aligns himself visually to approach, retreat, avoid, escape, evade, and enter he centers the coordinates within himself upon the coordinates in the real world around him and moves with efficiency to perform. Any cognitive ignorance of a spatial segment will disturb this process of centering and introduce a factor of stress into the performance which would not have otherwise been present.

Translating this theoretical proposition into prosaic daily experiences the child must learn to know where things are "out in space." He must learn the fixed placement of objects, routes of travel, relationship of the physical placement of one object to others. Directional words denoting movement or position must become a part of his cognitive repertoire such as left, right, up, down, side, above, below, under, between, next to, and many more similar terms. He must learn to move confidently from place to place because he knows his world. He must learn to move efficiently in a gross manner moving his body through space according to his visual appreciation of the "whereness" of the world. He must learn to move efficiently in the near space world of the desk-top world of education organizing margins, columns, rows and boundaries on papers and books.

Children were provided with a wide variety of activities to become aware of top and bottom within themselves and with the external environment. Right and left was emphasized within them and the full surround of objects, places and people. Front and back space were particularly emphasized in many different experiences.

Activities: The following listing is an example of some of the activities programmed throughout the year to enhance the children's awareness and perception of space.

Pointing with hands, legs or full body according to directional commands given by teacher marching according to spatial commands.

Placing self in relation to object according to teacher directive such as "near to," "in back of," "to the right of—," etc.

Identifying all physical characteristics of the room in spatial terms.

Hide and seek with objects using spatial terms

Translation of leftness and rightness, front-back and top-bottom to physical objects

Maze tracing

Floor routes for travel

Geometric patterning

Rearrangement of furniture according to spatial directives

Practice of reversals and inversions

Viewing variations in space relationships

Exploration of distortions in space

(For a detailed description of some of these activities, see Appendix I.)

Initial Problems

Only two of the children held a firm identification of leftness and rightness in their own orientation. All others either did not possess such labeling or could be easily confused. They experienced great difficulty representing spatial schema in drawings and frequently erred in complying with directional words. All had difficulty in understanding the concept of "back" space. The general label of "spatially naive" could be applied to all in the early period of the class.

Summary of Results

A firm knowledge of leftness and rightness in all areas of performance such as drawing, labeling hands and feet, labeling sides of objects in the environment, moving to left or right, and so on, was established for all but two of the children. Originally, teachers employed directives like "face the windows, turn toward the clock" etc., to obtain changes in position but eventually "turn to the right or left" could be substituted. Gains were noted in the understanding of "back space" and all children improved in their use and understanding of positional words. While they could not be classified as "spatially naive" at the end of the program, neither could they be considered to have reached the level of "spatial sophistication." Their positions on the continuum varied per child but the position in June was clearly in the direction of increased sophistication.

Dimension IV — Body Awareness

Definition: Body awareness is the capacity of the organism to achieve a conscious appreciation of the relationship of all body segments to movement, to be able to label body parts and to appreciate the functional properties of various body parts.

Discussion: This dimension includes the vast literature which has been devoted to the concept of "body image." Each individual must achieve a sense of identity to develop a world of self apart from others and yet in relation to others. This dimension in full efficiency for the individual establishes the positive answer to the question of "Who am I?" Extensive work by many investigators in the field of psychology has now produced a confirmed body of knowledge concerning the concept of self-image. Corporal reality is an integral part of the psychological mechanism of "self." To build an adequate self-image the individual must learn to understand his body and the manner in which it functions and is available to him in resolving the daily demands for performance.

The functional properties of body parts were stressed in the activity program to help the children come to a fuller appreciation of the use of eyes for seeing, ears for hearing, hands for touching, legs for walking, running and crawling, muscles in arms, legs, back and shoulder for pushing and lifting, and so on. Hearing for listening to variations in sounds, vision for steering the body, identifying the world, differences in muscle "feel" under varying conditions all became goals to be achieved.

The usual labeling process taught to preschool children frequently omits some of the unusual words to identify body parts. Therefore, the program included labeling of elbow, chin, wrist, shoulder, ankle, hip, calf, ribs, spine, etc. The use of body part words in general expressions of thought such as "leg of a journey," "arm of the law," "shank of the evening," may also be incorporated into more complicated programming of symbolic processes as they relate to body awareness.

Learning to understand the concepts of tension and relaxation as alternative states within their bodies was programmed within the curriculum. The attempt was also made to help them understand the relationships of mobility and immobility in movement patterning by constantly calling attention to those portions of the body which were *not to move* in order to insure the efficiency of the moving part. Movement efficiency depends in equal part upon the portions which must be held quiet or at rest and those which must move. Reverse attention to the *immobility elements* presented an interesting contrast for the children.

One of the major goals of activities within this dimension is to teach the child to understand his own body as the invariant spatial center for attributing spatial coordinates to the world around him. His own body lends itself to all of the spatial terms of top, bottom, front, back, left, and right. While his own body remains invariant he can alter the relationship of the outside world. He can write numbers upside down and by shifting his head and body so as to view these inverted numbers as if he were centering a football they can be made to appear to him as upright. The children explored space with their own bodies experimenting with upside-downess, overness, underness, —using their own parts as directional coordinates.

Experimenting with performances in different positions such as prone, supine, kneeling, crouched and so on were other techniques employed in enriching their understanding of the functional utility of their body parts.

Activities: The following list of activities was incorporated into the daily program to provide opportunities for children to enrich their body awareness:

Planned periods of alternating tension and relaxation of the total body or specific muscle groups.
Follow the Leader in moving
Ragdoll
Simon Says games
Trace source of movement when a leg turned, arm lifted, etc.
Grasping with toes
Movement from position to position
Labeling body parts

(For detailed descriptions of some of these activities see Appendix I.)

Initial Problem

Varying levels of awareness were observed among the children. Some were unaware of more than the simple infant-type labels. Few had labels for hips, thighs, calf, etc. None could be considered to have had any knowledge of the relationships among parts of the body and none could satisfactorily identify muscular sources of movement.

Summary of Results

This area is also considered as one of the significant areas of improvement. Children became aware of body parts throughout their bodies and with this awareness were able to trace movement origins, use appropriate labeling and apply this new found knowledge to advantage in all areas of performance. This area showed marked improvement for ALL children.

Dimension V — Visual Dynamics

Definition: Visual dynamics is the capacity of the organism to fixate accurately on a target at near, mid and far points in space, to scan a surround for meaning in the vertical and horizontal planes, to converge and accommodate, to equalize the use of both visual circuits in a binocular pattern to achieve fusion and to steer the body in proper alignment for movements through space.

Discussion: This dimension is concerned with far more than the determination of a given refractive status. Vision is viewed as a dynamic phenomenon used by the individual at varying distances according to the demands of his daily living. It may vary from moment to moment in efficiency according to the demands made upon it and the state of spatial competency held by the viewer. Developmental studies have revealed a normal progression from monocularity in the infant to bi-ocularity to a binocular stage and finally to a state of fusion. The human is equipped with a bilateral system of visual

circuiting intended by design to be used as a complex unit. Although each circuit may be capable of independent function it is held that optimal efficiency is derived when a binocular process is available. Despite the fact that a child may be wearing lenses designed to improve his spatial computing the educator must still be concerned with the functional efficiency of the child. Is he able to sustain visual attention at near tasks over a period of time? Can he readily shift from chalkboard viewing to his desk-top paper or book? Can he follow targets moving across a horizontal plant? Can he hold fixation on targets moved on the vertical plane? For educational purposes does he appear to be equally comfortable with materials near to him as those that are far away? Does he look where he is moving? Does he visually guide his manipulative activity? Does he judge space properly as he moves through it?

To help children achieve the highest possible efficiency in this dimension a variety of visual training activities were introduced. First and foremost the emphasis was placed upon *visual steering* as a vital component of all movement. This was not only verbally urged but visual targets of various kinds were pasted on floor, ceiling, and walls to serve such purpose. Scanning a broad visual array to find a requested detail was another technique. Visual inspection of articulation areas on geometric forms and the search for points of difference were used to enhance discrimination. The study of foreground and background to emphasize contour, edges, textures, nuances and shadings was a part of this dimension. A variety of activities were designed to increase the visualization of verbal images, recall of recently viewed objects and recall of past experiences. Shifting visual attention from one object to another randomly placed in various segments of space and specific tracking activities in the vertical, horizontal and diagonal planes were included.

The usual world of education sets two major planes for visual performance. One is the near-point visual surface of the desk top, the book and paper world of looking down and the other is the straightforward view of the far space chalkboard. In Movigenics the visual planes are programmed in as many different relationships as can be conceived. The children viewed visual targets from a recumbent position to the floor, ceiling and wall surfaces, from a kneeling position, sitting on the floor, and so on. Care was taken to provide an assortment of near, mid, far and remote distances for targets.

Dark viewing and varying amounts of lights from flashlights were other techniques. The presentation of tachistoscopic information was one of the key efforts in visual dynamics. The reduction of exposure time to a point where the children could quickly grasp and recognize visual forms at varying speeds was emphasized throughout the year. Eye patches were worn for brief periods of time while conducting general activities. The purpose of the eye patches was to help the children appreciate their own variations in performance from one system to another and to ascertain for the analysis of each child specific notations in changes in efficiency from side to side. Notations were made of behavioral, postural and performance changes.

This area of programming is viewed as the significant activity sequence within the curriculum. The world of school is essentially a near-point visual demand which is imposed upon the child for the major portion of each school day from kindergarten through high school. The vast majority of his exposures to advancement in learning will come from the desk-top world of books and papers. He will be locked into this near-point world with considerable intensity. The more difficulty he encounters the more stress will he experience. The visual containment of school and its effect upon visual efficiency must be regarded as one of the most important areas of investigation for future research. The programming within this class was only a beginning attempt to study this area.

Activities: Visual training in the educational sense as it can be applied within a classroom utilized the following activities:

Horizontal and vertical tracking by visual follow of a string-suspended plastic ball
Tracing boards with basic designs

Tachistoscopic presentation of form pattern slides
String test
Finger jumps (visual fixations from one outstretched hand to the other)
Symbolic representations
Visual recall of immediate and remote
Throwing at a target
Ducking and dodging
Gestural communication

(These are some of the activities included in this area. Detailed descriptions may be found in Appendix I.)

Although the term visual training is a term employed with specific meaning by optometrists and ophthalmologists, the adoption of the term in Movigenics is not intended as a substitute for such professionally defined services. The term is employed here to encompass a specific set of activities which may be practiced in a regular classroom for the general benefit of all children. The visual skills to be developed are essential to full efficiency. Individual visual problems require the services of the respective professionals outside the classroom and in certain cases some of these activities may be contraindicated. Consultations with visual examiners may provide other valuable suggestions to teachers seeking to enrich the visual efficiency of classroom learners.

Initial Problem

None of the children were visually efficient upon entry to the class. This finding was the only uniform observation. While the children differed from one another in many respects, each had a visual problem. They could not sustain viewing in near activities, had difficulty shifting from far to near targets and had not truly learned to visually steer their movements. None could sustain a satisfactory pattern of tracking vertically, horizontally or on the diagonal. All had some form of convergence problem. This was perhaps the most striking problem area for the three groups.

Summary of Results

With two exceptions all children were referred for visual examinations and several received lenses as a result of that referral. Here was an area where all children gained from the visual training experiences in the classroom but the gains could not be classified as significant. The concept of visual steering was learned by all and in this respect a significant gain was achieved. Smooth patterns of visual patterning unfortunately were not obtained. Although there was a great deal of improvement in visual efficiency and visualization the gains did not reach the level hoped for in the planning. This is a vital area for concern. Professional guidance from visual examiners skilled in visual training might well have increased the value of these activities. Gains in this area are considered to be most critical for total efficiency and the entire area should receive greater emphasis.

Dimension VI — Auditory Dynamics

Definition: Auditory dynamics is the capacity of the organism to process information on a receiving and a sending basis from the world of sound and to attach appropriate labels and attribute appropriate relationships to the world of sound.

Discussion: The world of sound may be broadly divided into three major categories of words, rhythm (music) and noise. From the moment a child is born he is bombarded by a "booming buzzing confusion" of sound which must be sorted out and arranged in order of importance and relevance. The foreground for attention must be differentiated from the relevant and irrelevant background. The sounds of speech must be learned and incorporated for interpreting that which is spoken to the child and that which he wishes to speak to others. He must learn to differentiate the sounds in his environment so he can make use of them to obtain an ever-increasing body of sound information.

Once again the concern in Movigenics is for the functional efficiency of the auditory process. The presence of discrete minor variations in acuity is of diagnostic import and may serve to explain some inefficiencies but the child must function on a day by day basis in a world of sound finding some means to gain more and more information even if it is reduced in its intaking process.

Two levels must be included in the auditory process. The intaking process has been labeled in various ways by investigators.

Some refer to "decoding," some to "signal interpretation," some to "clue-systems." Whatever labels are employed to designate the process the individual must find some way of gaining meaning from the acoustic energy which impinges on his tympanic membrane and passes through the auditory neurologic system. For most children the audiologist indicates an unimpaired physical system. The perception of sound then becomes a crucial determinant of the amount of meaning which may be acquired from the world of sound. While the majority of children with learning disorders are likely to present an intact auditory system their capacity for listening presents an area of great difficulty. The emphasis in the experimental class was, therefore, placed upon the development and enrichment of listening skills. Listening demands attention to organized units of sound sustained over a period of time necessary to complete the intake process. To develop listening skills the use of the Maico Train-ear as an amplification device was introduced to acquaint children with the possibility of increasing or decreasing volume selectively to change the auditory intake. A variety of "volume-changers" were used throughout the year to allow the children to experiment with modifying the sound intake. Placing the modification of sound within the manipulation of the children served to entice their attention to the study of sound variations. The discrimination of different tones in musical themes, listening to whispered directives, exploring sound differences from back space, front space, side space above and below, all were used as techniques in achieving greater competency in listening.

The child must also convert the world of sound into an expressive level to build a communication system with the people in his world. Consequently, the activities in the dimension of auditory dynamics must encompass expressive experiences as well as receptive. By and large, the presence of specific speech difficulties was a minor problem to the total group.

Children explored vocal variations speaking softly or loudly, yelling and inventing wierd sounds. They learned a song in French and tried to invent a different sound language.

Activities: While there was an inevitable demand for listening and speaking in the general program, the following activities were specifically employed to achieve the objectives within this dimension:

Bells of Sarna worn on wrists and ankles
Maico Train-Ear
Vocal explorations of sound
Identification of sounds
Listening for sounds in dark time
Percussion recordings
Poetry and rhythmic speech patterning
Singing songs to build retention
Plotting conversations

(Some of these activities are described in detail in Appendix I.)

Initial Problems

All of the children were classified as poor listeners and manifested many problems in perceiving auditory stimuli. Only one of the children had a significant speech problem. Language formulation problems were also noted in all children.

Summary of Results

The activities designed to improve listening skills achieved the intended goal. All children became better listeners through the year. Their attention spans for auditory material were extended and there was a general gain in alertness to verbal directions. The significance of these noted improvements for total efficiency is difficult to assess in precise terms. The value of programming specifically in this area has been established.

Dimension VII — Kinesthesia

Definition: Kinesthesia is the capacity of the organism to maintain an awareness of position in space and to recall patterns of movement from previous experience for utility in resolving continuing demands.

Discussion: Kinesthesia is a difficult term to define. It is used frequently in the literature

in the discussion of movement patterning but the definitions vary from author to author. Within the limits of Movigenics the term is used to denote an "awareness of movement" implying a cognitive appreciation and enjoyment of the "feel" of movement. It is viewed as a function of tactuality and proprioception with the added ingredient of a specific perception of movement to bring the action to a full state of meaning. To move the body, the individual must simply apply a thrust and counterthrusting action to propel himself through space. In many retarded children it seems that this is possible without the conscious awareness of what parts are moving and why these parts are moving. Often retarded children will be stymied by the next movement demand apparently unable to recollect the method of proprioceptive organization by which they solved the problem on the previous occasions. In movement processes this dilemma is similar to the young reader who does not recognize that the word on page two is the same as the word on page one and approaches it as a totally new experience. Within the dimension of kinesthesia is the general discrimination of a similarity identification among movements. Every individual is kinesthetic to some degree or other. For some learners the kinesthetic process is a vital highway to learning. For others there appears to be little appreciation of proprioceptive experience.

Within the term here is the general concept of an awareness of comfort. There is a feeling within the individual that the movement is proper or improper. There is also the connotation that this is a pleasurable experience. The term also conveys the concept of experience which allows the individual to call upon a repertoire of movements to select the pattern most appropriate to the next movement demand. This is the meaning of the "memory of movement." It is a proprioceptive storehouse which yields its contents as needed by the individual in day by day encounters and permits the individual to trust to this warehouse to bring forth the proper pattern for the confronting problem.

The goal in this dimension is to bring children to a conscious state of awareness of "how it feels to move in a particular way" and to help them differentiate *this* way from other performances. For purposes of Movigenics the verb, "kinesthecize," has been coined for application to the experience of consciously identifying particular proprioceptive patterns as being more meaningful than others. Here is the idea of utilizing muscles not only for power and stamina but the delicate development of shadings and nuances of muscle groupings to achieve grace and ease. It is not only that muscles can thrust and counterthrust, expand and contract and serve as agonist and antagonist but within the framework of kinesthesia a proprioceptive pattern may "whisper" when necessary or "explode" when necessary. In Kinesthesia the grasp of the fingers may be forceful or tender, clutching or tentative — all of the possible shadings of force are applied purposefully to the situation to the efficient resolution. The power available within the muscular strength of the individual is judiciously applied to the efficiency of movement. Kinesthesia may also be regarded as the cognitive processor of muscle strength. Individuals who have a high appreciation of kinesthesia delight in the finesse of movement and find a great deal of satisfaction in using the proprioceptive system to enhance their learning. The goal of activities within this dimension was to provide opportunities to the children for learning proprioceptive nuances and shading to advance their general movement efficiency and to provide their learnings with a general proprioceptive reinforcement.

To achieve this goal multiple learnings of the same bit of information processed through a variety of movement patterns was the principle method employed. Concentration upon three different methods of crawling, the homologous, homolateral and crossed diagonal initiated the work in kinesthesia. The purposeful replication of the Tonic-Neck-Reflex patterning in the prone-supine and standing position was also emphasized. The purposeful use of muscular strength to achieve height and distance in jumping was another programmed activity. Tracing numbers and letters in air or by foot upon the floor to "get a different feel of writing" was also included under

this dimension. Repetitive rolling to maintain an alignment by processing a movement pattern from segment to segment on a cephalo-caudal progression was another experience provided to the children.

The conscious application of thrust and counterthrust in the process of movement, the variable applications of force, the purposeful alternation of sides, the variabilities in arm and foot extension through the use of tools and deliberate identification of which set of muscles carried the initiating of movement and which set completed the finer stages of movement were all included as directed program in this area.

Activities: Although some activities appear to replicate others already described, it must be remembered that within this series the conscious awareness of differences in "feeling of movement" and the variable application of movement was introduced as a refinement to basic movement patterns.
Homologous, homolateral and crossed diagonal patterns of movement
Jumping from a perch and over obstacles
Pushing and pulling
Variable grasp and release
Writing in air or tracing on the floor
Repetitive rolling
Variable weights in objects to be carried or thrown
Kicking
Variable thrusting patterns
Tracing initiation of muscle patterns

(For a more detailed description of the manner in which these activities were conducted, see Appendix I.)

Initial Problems

During the first weeks of the program all children revealed immaturities in movement patterns of crawling, rolling, jumping, hopping, skipping, showing little awareness of a "feeling for movement.' '

Summary of Results

An overall gain was noted in the children in their ability to process the feeling of movement. They became more aware of how muscles feel in a relaxed state versus a tension state, how muscles feel when stretched and how to organize their body parts to achieve movement. All children showed gains in kinesthesia — some to a greater extent that others. The greatest gain was the development of a "perception of movement" which was literally unknown to them in September.

Dimension VIII — Tactual Dynamics

Definition: Tactual dynamics encompass the capacity of the organism to gain information from the cutaneous contact of active or passive touching.

Discussion: The word "dynamics" is coupled with tactual to incorporate the concept of a process and not the simple act of contact. Tactual dynamics include not only the surfaces of the hands which are the typical areas for perceptual investigation but also other cutaneous surfaces over the entire corpus. The perception of thermal variations, perspiration, wind, water and so on, are also included in the concept of tactual dynamics. The soles of the feet must be sensitized to texture variations in substrata to initiate the organization of kinesthesia and dynamic balance. The soles of the feet must also become sensitive to variations in grading and inequalities. While the hands have frequently been associated with the perception of textural variation, the rest of the body surface must also respond to texture differences. Variations between rough-smooth, hard-soft, liquid-solid, wood-stone, thick-thin and many other dichotomies fit within the province of tactual perception.

Touch is divided into two areas (1) active touch in which the individual reaches for contact of some sort and (2) passive touch in which contact is made with the skin surface without active participation of the individual. Tactile scanning of moving some section of the skin's surface over a texture or collection of textures to identify and gain meaning is another component of tactual dynamics. Some areas of the body surface have been found to be less sophisticated for meaningful discriminations between stimuli but the general literature in this field is so limited that no firm body of knowledge is yet available which could lend itself to critical evaluation. For the most part investigators have tended to ignore this area of study in favor of other ventures.

There appears to be a frequent confusion between tactual and kinesthetic performance. In some instances the words are used interchangeably while in other instances the words are used as an inevitable duet and called the "haptic sense." Under the Movigenic set of constructs tactual is limited to the perceptions which arise from the sensitizing and energizing of epidermal surfaces. Where muscle processes are necessary to conduct search, lift, pull, transport or hold balance, and certainly involve the kinesthetic process, these are held to be secondary to the consideration of tactual perception. While movement may be essential to bring a body surface to a point of contact, it is the perception of the contact which is vital to tactual dynamics and the kinesthesia merely serves to complement the process.

Active touch is a seeking for cutaneous information. Tactile scanning is active use of hands searching over an object or a surface to gain information. Two hands scanning the same objects take in information independently searching out textures, contours, edges and resilience. Each hand, as it were, contributes its respective information to a point of perceptual fusion to permit identification. The remarkable achievement of tactual fusion while recognized by all clinicians is scarcely understood in terms of the neurologic dynamics which make this possible. While it is relatively easy to observe this phenomenon in the use of finger searching the same phenomenon does not seem to occur from bilateral contributions of feet and other bilateral skin surfaces.

In seeking to provide tactual discrimination experiences on an active level the most obvious approach of blindfolding children and placing various objects or textures in their hands was the first technique employed. Active scanning of strange objects and textures was used next requesting children to identify various characteristics of hard-soft-thick-thin, and so on. Hot and cold immersions can also be used. The simple process of providing similar objects composed of varying textures for general use in building or play is another procedure for tactual dynamics.

Passive touch is the imposition of stimulation on a skin surface by the teacher. Teachers brushed children's faces, arms, neck, legs and hands with f e a t h e r s, brushes, woolens, cotton and so on, asking for the texture to be labeled or the body part being contacted. Using a pointer or a finger to press on a body site and have the child identify it was yet another technique. The major goal in tactual dynamics was to make the children aware of cutaneous surfaces as a source of perceptual information and to extend their resources for such information beyond the fingertips. Furthermore, the effort was made to teach the groups a system for tactile scanning and to provide as many opportunities as possible for providing cutaneous experiences of difference. Both hands and both sides of the body were stimulated to assess difference.

Activities: The activities in this area were more exploratory than most of the others because so little information is available in the literature to guide the planning of tactual activities. The list to follow is but a small sample of the various efforts that were made:

A box filled with beans to find hidden objects with the hand or the foot.
Feather or brush stroking
Writing numbers or letters on the back, neck, arms or legs
Matching textural patches of material while blindfolded
Walking on various grades of sandpaper while barefooted.
Touching body parts with a pointer
Vari-textured materials
Blindfolded-inspection of objects placed in the hand.

(Detailed descriptions of some of these activities are contained in Appendix I.)

Initial Problems

The dimension was quite uniformly good for all children. They responded well to touch experiences from the onset of the program and entered eagerly into tasks involving tactual exploration. Only at higher levels of processing textural variations was any difficulty encountered.

Summary of Results

Since the tactual modality represents a more primitive system for processing information it

is not surprising that children who were visually and auditorially inefficient should rely upon and have some skills in tactual perception. The experiences provided them with opportunities to refine and further develop perceptual acuity in this area but no dramatic gains can be reported.

Dimension IX — Bilaterality

Definition: Bilaterality is the capacity of the organism to reciprocally interweave two sides in a balanced relationship of thrusting and counterthrusting patterns around the three coordinates of vertical, horizontal and depth in proper alignment from initiation to completion of a task.

Discussion: Bilaterality is the optimal enrichment in functional utility of a symmetrical organism. Bilaterality is not limited to a consideration of two hands or two legs but encompasses binocularity, binaurality and bitactualness. Bilateral equivalence is necessary to dynamic balance. Any perturbation to the equality of both sides produces a stress upon development or performance which requires the building of some minor distortion if the task is to be resolved and a state of balance regained. Balance is maintained by some equality of contribution from the two sides of the body.

For the most part the activities programmed in the area of bilaterality were confined to the hands, arms and legs. While the other functions are important the bilaterality component within them was considered under visual, auditory and tactual dynamics. As a general rule, children progress from an infant bilaterality to the selection of a preferred side and because of progressive emphasis upon the preferred side throughout early development tend to lose the potential efficiency residing in the non-preferred side. In the firm belief that the bilaterality designed into the human organism is intended to optimize efficiency a deliberate plan of action was initiated to acquaint children with their non-preferred side. For all but one of the children this meant an introduction to their left side!

It was not difficult to demonstrate a marked discrepancy in performance or skilled actions between the left and right sides. Bilaterality activities were not programmed to provide an emphasis upon the non-preferred side but rather to use both sides simultaneously in the same task or to provide for rapid alternation. There was no intention to achieve equal skill levels but merely to provide bilateral experiences. Three approaches are possible here. One, the two hands or two feet may be used to perform the same act simultaneously on their respective sides of the body. Placing the child at the chalkboard fixating on a visual target at eye level at the body midline both hands were extended upward on the chalkboard. With a piece of chalk in each hand the child was requested to continue circular movements with both hands simultaneously. Vertical and horizontal lines were also requested. The simultaneous writing of their names in cursive or manuscript form and the writing of numbers were extensions in complexity of bilateral function. Numbers and words were written in the two forms, proceeding in a left to right orientation and with the non-preferred hand writing a simultaneous reversal. Children experimented with bilateral simultaneous squares, triangles, simultaneous reversals and inversions and so on, at the chalkboard.

Another method for bilateral training is the use of two hands at the midline for pushing or pulling. Quick alternations on a center guide line to pull themselves through space served as another variation. A third technique of performing the activity first with the left and then the right hand or foot was also included. Each activity was attempted with each side separately and then with both sides simultaneously. The use of plastic templates at the chalkboard or at the table to trace various geometric forms was attempted with the preferred hand and then the non-preferred hand. Figures, numbers and letters were traced on the floor with either foot or traced in the air with either hand. The flat scooters which allowed children to lie prone upon the surface and propel themselves along the floor by bilateral or alternate hand paddling proved to be an intriguing experience for all of the children.

Within this dimension the children experimented with the use of their sides as a

simultaneous phenomenon, as an alternating process and as single sides building an increasing awareness of themselves and their potential.

Activities: Each of the activities listed was programmed for simultaneity, alternation and simultaneity on respective sides:

Bilateral chalkboard forms and writing
Plastic templates at chalkboard and table
School skill tracing boards with alternate hand use
Balancing on teeter boards
Alternate jumping on jump boards
Scooter board peddling
Pulling and pushing
Tracing in air or on the floor

(For detailed descriptions of some of these activities, see Appendix I.)

Initial Problems

Essentially, all children could originally be classified as one-sided. The use of the non-preferred hand or foot was resisted by them and the skill level using both sides simultaneously or in alternation was extremely low for all. Kicking with the non-preferred foot caused many to fall or miss the target completely. Shifting from side to side in jumping caused loss of balance. In general, one side of their bodies could be termed "ignorant of what the other side was doing."

Summary of Results

The "ignorant" sides became knowledgeable for all. The children thoroughly enjoyed exploring the simultaneous use of both hands or both feet and frequently exclaimed in excitement over some discovery they had made about their bilaterality. This area provided the greatest amount of gain for all children. None failed to achieve a "new" appreciation of their "other sides." Varying levels of proficiency were achieved — some learned to write their names equally well with both hands — some continue to practice. None of the children switched preferences and for none did the overall performance of the non-preferred side surpass the preferred side. However, this was one area in which the children themselves fully appreciated the progress they had made. This dimension rates as among the areas of greatest improvement.

Dimension X — Rhythm

Definition: Rhythm is the capacity of the organism to synchronize patterns of movements according to situational demands, thus achieving harmony, grace and use of movement.

Discussion: Each body part available to voluntary control of movement should be able to move in association with an established tempo or beat. Analysis of all movement patterning indicates that the essential ingredient in any form of patterning is the temporal sequence of each part of the composite. General patterns of movement may be classified as arhythmic, dysrhythmic and rhythmic. Arhythmic movement is observed as a diffuse, random, apparently disjointed set of movements wich seem to have no organization. Dysrhythmic movement is a demonstration of inaccuracies in temporal sequencing and are manifested in a jerkiness, spasms, sudden thrusts and "slurring of sequences." Rhythmic movement of graceful and comfortable sequencing with a definitive temporal quality is desired. Speech must be rhythmical for optimal fluency. Writing for legibility and consistency of execution must be rhythmical. Walking must demonstrate rhythm. All sports demand some form of rhythm to achieve proficiency. Rhythm is an essential to movement. It is present to some degree in everyone.

The concept of moving to a particular cadence is not a typical experience for most children. Consequently, the introduction of a metronome or a tom-tom to establish a tempo for movement represented a unique experience for the children.

The regulation of a walking pattern according to variations in cadence, jumping on the beat, crawling, rolling, hopping and drawing on the beat were some of the techniques employed under this dimension. Marching to martial recordings of varying tempos was another way of introducing rhythm into movement. Establishing rhythmic progressions of words in songs and poems served as another technique. The effort was made to incorporate an accent or a beat in all movement activities.

Activities: Three forms of accentuation were employed. The metronome which allowed for a regulation of tempo by setting the

dial, the tom-tom which permitted the teacher to tap the beat, and march music were used.

Although the activities were essentially similar to others which have been described, a section in Appendix I is devoted to rhythm activities.

Initial Problems

Most of the group could be classified as dysrhythmic in their early movement patterning. They were literally unaware that such a phenomenon as rhythm actually existed. The simplest rhythm activities requiring association of movement with some form of beat could not be adequately performed.

Summary of Results

Several children showed dramatic benefit from the rhythm training by becoming quite graceful and skillful in moving to rhythmic tempo. Not only did they perform well on beat but there was a marked improvement in general movement. Every child improved in association of movement and beat — some more than others. The overall gain was so marked for the entire group — even for those whose level remains low — that this area must also be regarded as a significant contribution to their development.

Dimension XI — Flexibility

Definition: Flexibility is the capacity of the organism to modify or shift patterns of movement appropriate to the situational demand.

Discussion: Under this dimensional heading is included the general concept of multiple patterns of movement. With flexibility the child can move fast or slow and can change pace on command once in motion. The child can shift from one type of pattern to another under conscious control. Activities under this dimension seek to provide the child with a repertoire of response patterns available to his use as a situation may demand. Here the emphasis was placed upon providing the child with multiple techniques for solving the same problem. The converse of flexibility is rigidity in response — having only one method for attacking a problem. This becomes very limiting in a variable world.

A repertoire of transport patterns allows a child to move through space by various methods. He may crawl, roll, hop, skip, walk, run, and so on. He may take a variety of routes to come to the same terminal point.

The major goal under this dimension was to provide the children with countless opportunities to experience differences in tempo, patterns, routes and modes.
Some experiences were given in changing auditory phenomenon to visual signs and vice versa.

Activities: Within this framework all of the previously mentioned pieces of equipment were used in the manner described with the additional directives listed below according to teacher directive:
Stop and go
Fast and slow
Change tempo in midst of activity
Change patterns enroute
Changing modalities from visual to auditory

(Since the activities are identical and involve only the shiftings to be directed by the teacher, no specific descriptions are included in Appendix I.)

Initial Problems

In September the entire group moved stiffly, could not shift directions, could not readily adapt to changes, did not perceive subtle changes and generally could be termed as "inflexible."

Summary of Results

As a group the children learned to accept changes without disturbances and move eagerly into new experiences. They adjusted movement patterns on command or according to changes in tempo. The general range of behavior for all children showed a vast gain and was a significant area of change.

Dimension XII — Motor Planning

Definition: Motor planning is the capacity of the organism to plan a movement pattern prior to execution in order to meet the demands of a task.

Discussion: Although the activities incorporated under this dimension have already been described in previous discussions a number of comments may be made. The concern here is for planning. This requires some cognitive processing before the actual movement takes place and becomes a matter of a cognitive rehearsal. Seeing a bench or a table to be crawled under the child must plan in advance how he will govern his moves in order to avoid bumping. This required some estimation of the space and his own projection of his own occupation of that space in the act of moving. The most interesting composite designed for this activity was an obstacle course within the classroom which demanded seven or eight different patterns of movement to "run the course." Chairs, tables, rails and any available piece of equipment was included at one time or another in the makeup of a "course."

Motor planning requires a knowledge of one's own movement repertoire and some spatial estimate of the presented demand. To scale a barrier some plan of thrust must be made. To jump a given distance some signals must be sent to leg muscles. Trial and error approaches are time-consuming, uneconomical and most times yield negative results. Some forethought allows for revision of plan when errors in calculation are observed but absence of a preplan results in haphazard efforts to change what was originally unplanned.

Activities: The activities under this dimension were similar to others already described and involved only a teacher reminder to plan in advance and then check their own plans against the actual experience of moving.

Initial Problems

In the beginning the children were "trial and error" movers trying to modify patterns while in the midst of a situation without reason. They were all easily "lost in space" when directions were given. They could not plan in any activities.

Summary of Results

An overall gain in the ability to plan before moving into a problem was observed. The randomness of "trial and error" behavior became less pronounced. Children began to consider their responses and plan them before making them. This was another area of significant improvement for all.

General Summary

The most significant improvements were noted in Dynamic Balance, Kinesthesia, Rhythmic Movement, Bilaterality, Flexibility and Motor Planning. Less dramatic gains were noted in the other areas.

Every child benefited from the experience even though the level of profit varied from child to child. The program itself organized according to the twelve dimensions had value to the children's development.

SECTION V
INITIATION OF THIRD GROUP

The development of a third group composed of pre-academic children was initiated in March. A highly skilled teacher with many years of experience in teaching and supervising nursery and pre-school programs was assigned as teacher for this group. This teacher was also a graduate student from the Department of Counseling and Behavioral Studies from the University of Wisconsin.

Although the general program followed the outline of the two established groups some minor variations were introduced because of the age of the children and certain problems in behavioral control. Since it was essentially an addendum to the basic program, a description of this group is treated separately.

The Children

Of the six children in the group, three were medically diagnosed as "brain-damaged" and one was psychologically diagnosed as immature or mentally retarded. Of the other two, one gave evidence of gross disinhibition and the other exhibited bizaare behavior with a strong emotional overlay.

Five of the children attended city kindergarten half days, and one attended a full-time first grade. The first grader and three of the others were released from their regular classes for SLD sessions. The other two attended afternoon kindergartens and one was supervised by a "matron" during the greater part of his kindergarten session.

Four of the children were boys; two were girls.

Schedule

The class met three mornings per week on Mondays, Wednesdays and Fridays from 9 to 11 a.m. Four of the children were transported by taxi; two attended a morning kindergarten in the same building as the SLD class.

Method

Four of the children were observed in their classrooms before the sessions began. The other two were known to the teacher through earlier school experiences. Teachers of the four children observed were interviewed at some length. Teachers of the other two children were not contacted and this omission is regretted. Parents of five of the children were contacted and initial conversations were held with each. Further talks were held with three of the parents and a final interview is planned with each family.

One conference was held with the supervising "matron" in the afternoon kindergarten class. There of the kindergarten teachers (four children) participated in follow-up discussions and two of them observed the class in session.

Class sessions included approximately 1¼ hours of group activity and 45 minutes of free play during which the teacher worked with individual children.

Program

The daily schedule follows (time sequence is approximate):

9 A.M.	— arrival, greetings, removal of shoes
9:05 to 9:20	— exercises for general coordination and muscular strength
9:20 to 9:30	— rhythmic activities with tom-tom or metronome
9:30 to 9:40	— "dark time" for relaxation, visual and/or auditory training
9:40 to 9:45	— group work at table or on floor, usually for spatial awareness or visual dynamics
9:45 to 10:30	— free play time — materials are available and teacher works with individual children
10:30 to 11:00	— clean up; shoes on; group discussions, finger plays or songs; story; dismissal

The following is a list of tasks and activities presented within each of the twelve dimensions. Most were presented to the full group. Those presented to the children individually are noted with an asterisk.

Dynamic Balance

Balance beam with variations particularly of the visual target and also of the arm position
*Balance boards used by the children at their own pace
Jump board
Transport through space walking, running, galloping, sliding, exaggerated heel-toe walk, tiptoe walk.

Spatial Awareness

Entire room used for transport forward, backward and sideways
Games involving use of body over, under and through
*Balance beam backwards
*Ball thrown backwards between legs
Terms "right" and "left" used in giving directions
Geometric shapes duplicated by walking on floor
*Geometric shapes duplicated by sliding bean bags along the floor
Shapes identified, duplicated or copied by pasting, with pegs, on flannel board, with projector, on paper
Designs copied with poker chips, mosaics, cuisinaire rods
Flannel board used for over, under, next to, right, left, on top of, underneath
Quantities identified with show of fingers, clapping, jumping, beating drum

Muscular Strength

A limited number of exercises:
prone
supine
sitting on floor
standing

Body Awareness

Figure drawing
Shadow play
Finger plays
Imitation of teacher's movements
*"What am I touching?" (with or without blindfold)
"Put your hand on your nose" etc.
"What do you see with," "hear with," etc.
Child lies on a piece of wrapping paper and teacher traces around entire body. Child fills in and completes picture.

Visual Dynamics

Visual targets always used for crawling, rolling, walking rail and walking beam.
Tracking of flashlight beam in dark room
*Tracking one light beam with another of a different color
Quick spotting of light beam going on and off and appearing in different parts of room (children supine)
*Tracking of ball on string, sitting, supine on the three coordinates

For visual memory:

Tachistoscope
"What color is a lemon?" etc.
"Tell me something that is red" etc.
"Which is bigger, a shoe or a coat?" etc.
"What color is the cover on your bed?" etc.
and many more
A number of toys or other small objects are displayed, then hidden. Child recalls what he has seen
A number of toys are removed. Child must identify missing item or items.
Game — While children close their eyes a small, previously shown toy is placed in plain view, somewhere in the room. Children walk around looking for it and sit down quietly, looking at it when it is found.
Puzzles, pegs, cuisinaire rods for building, parquetry blocks.

Auditory Dynamics

*Pairing of sound boxes
Identification of sounds in the dark
Singing
Listening to songs in foreign languages
Identification of English words embedded in songs in foreign languages
Singing only the specified section of a song
Repetition of drum patterns
Response to varied rhythms
Stories
Conversation
Directions given in varied pitch and intensity

Kinesthesia

Tonic-neck-reflex patterning supine and prone
"Angels in the snow" and variations thereof.
Rolling
Rolling situps
Walking, running, galloping, etc.
Jumping in place, from a height, over obstacles
Conscious relaxation
*Use of scissors, pegs and other small objects.

Tactuality

*Identification of known and unknown objects by touch
*Identification of objects buried in box of dried beans, blindfolded
*Free play with beans
*Pairing of varied fabrics blindfolded
Discussions around the feel of objects in pictures
Discussions of hot and cold objects

Bilaterality

Bilateral circles on chalkboard
Bilateral horizontal lines on chalkboard
Angels in the snow
Scooter boards

Flexibility

Response to sudden changes in drum beat
Follow the leader
Follow a path made of objects, lines on the floor, footprints, hand and knee prints
Songs that give directions to follow
Changes in the daily routine

Rhythm

Move parts of body to beat of metronome — sitting, standing, walking

Move to metronome walking, running, sliding, etc.

Rhythmic movement to drum beat: walk, run, gallop, jump, crawl, parade, tiptoe, walk and stop, walk and run, walk and flop, fly like birds, hop like bunnies, dance like Indians, etc.

Roll ball to beat of metronome

Bounce ball to beat of metronome

Clap, tap, etc., to beat of metronome

Variations on the traditional "patty cake" game

Dance to songs

Sing

Listen to poetry

Motor Planning

Play catch with ball and toss ball at target
Play catch with bean bag and toss at target
Follow the leader
Simon says

Game requiring children to go over, under and through and to follow footprints, hand and knee prints.

Results

A group feeling was achieved fairly quickly. The children learned to wait for each other, make room for each other, bring supplies to each other, asked for absent children and communicated and played together. One child might be cited as an exception.

The children learned to respond as a group to most requests and directions and sometimes became impatient with individual negative behavior. At times an individual's hyperactivity or silliness spread through the group but more often most of the children waited for the recalcitrant child to "come around."

SECTION VI

GENERAL POSITIVES AND NEGATIVES IN THE PROJECT

A demonstration program is intended to demonstrate something but by its very nature is expected to encounter both positive and negative features along the course of its development. This project has run true to expectancy.

A review of the year's experience and a general inspection of the accumulated data have yielded a set of general negatives and positives. Since this project was conceived as the first of a series it is likely that the negative features will be more influential in future planning than the positives so the series of negatives will be discussed first.

Negative Aspects

1. Nine different elementary schools were represented in the experimental group. Each child was essentially identified with his neighborhood school and entered the experimental class as a stranger to the others in the group. The homogeneity of "learning disorder" which brought them together was an administrative device but the homogeneity was not perceived by the children. The children perceived themselves as "not belonging to this school building" and, therefore, viewed themselves as "visitors." Since their attendance time was greater in number of hours in their neighborhood school each week, their affiliation continued to be with that school. It was as though they had nothing in common with other children in the experimental class except an identification of "learning disorders." A wide variety of social backgrounds, economic levels, actual grade placement levels, self-perceptions, physical size and other characteristics contributed to the "strangeness." Establishing a group identification was unduly complicated by this circumstance.

2. A second problem was closely related to the "stranger" phenomena. Children were transported to and from these classes under school transport arrangements. Throughout the year the problem of arriving "too early" or "too late" was a persistent factor. Not being identified with the school the children wandered aimlessly if they came too early or entered the classroom long before the teacher arrived. The usual result of the "early arrivers" was a build-up of hyperactivity which was difficult for a teacher to compress once she entered the room. "Late arrivers" interrupted the activities in progress.

3. Although all children had "significant retardations in academic work," the retardations varied a great deal. Regardless of the function of traits to be considered a wide range of variations existed among the children. At no point could the group be defined as "being at the same level." This variation phenomena caused some complications in programming and management of behavioral responses.

4. In the original planning of this experiment it was decided to have a minimum of communication with the child's classroom teacher for two reasons: (1) to avoid being influenced in the daily curriculum by the specific problems of each child as they might be occurring in the regular classroom and, therefore, modifying the experimental curriculum towards meeting specific needs; and (2) to avoid influencing the classroom teachers' observations of any changes in behavior by giving her detailed information about the experimental activities. It was hoped that the gains made by the experimental group would be reflected in changes in behavior and performance in their regular class which might be observed by their teachers as improvements. Since the intent of the class was to achieve an over-all improvement in performance, the effort was made to avoid linking a specific gain to a specific experimental activity — at least not in this first year. Although this point of view held some experimental validity and might be justified as a technique for avoiding a bias in evaluating results, it proved to be a negative feature in the general plan. It was a mistake to have purposely minimized communication. Some teachers were suspicious, some resentful, and some passive. Since the teachers had little knowledge of the program, they had some difficulty in ascertaining change because no clues had been provided. Throughout the year many problems might have been more readily resolved if the communication pattern had been developed.

5. Another negative resulted from a failure to provide a pre-enrollment orientation to the children themselves. Already having an image of failure they arrived for the first day of class not quite knowing why they were there, what would happen to them and what relationship this experience might have to their regular placements. It was felt that an orientation prior to arrival would have been very helpful to the early strangeness and difficulties in adjustment.

6. The entire group in each class started on the same day. The elements of strangeness, lack of identification, different school building and all the other negatives were compounded in demanding a total group response immediately. A program of scheduled entry starting with one or two children and progressively increasing the size of the group to full enrollment over a period of weeks would have permitted a better adjustment process for both the children and the teachers. Certain behavior negatives which flared under the stress of demanding a group adjustment might have been avoided by a modified intake program.

7. No specific program of pretesting was conducted. In general the major items of information about each child consisted of age, name, and the knowledge that the child had a significant learning problem. General school records were used in making the selection of children and whatever tests may have been given to the child in the course of typical study by the school psychologist entered into the selection process. However, no effort was made to define any test battery for each child as a prerequisite to admission. By choice, even these records were not made available to the experimental teachers. Once again this decision may have had some validity in relation to the curriculum goal but it proved to be a negative when analysis of results was contemplated.

8. The entire experience was also a novelty for the three experimental teachers. While the teachers had all taught classes before and had experience with various disability groups, they had never attempted this form of curriculum. The usual reliance upon books, seat-work, story periods, craft-work and almost all of the content and process which might be classified as a "methodology" were removed from the situation. The teachers themselves learned the curriculum week by week and day by day. They, as teachers, were also a part of the experiment. Although they had some familiarity with the general theory which was to govern the development of the curriculum, the curriculum itself did not exist in September, 1964. Week by week the curriculum took form. Activity schedules were defined, almost without regard for the children during the early stages. This frequently placed the teachers in a state of uncertainty. They programmed lessons using material and equipment with which they were unfamiliar. The children were strange to each other and to the teachers. Practically no information was available on the children. The teachers learned to know the children per situation — per day while they attempted to resolve the daily problems, learn the use of new equipment, and to operate in a free environment.

In retrospect this proved to be another negative. While some experimental values might be attributed to the general concept of taking relatively naive teachers (at least from the standpoint of this curriculum) and testing their adaptability to this form of curriculum, it added another significantly negative variable to the early period of development. This is now regarded as a variable which should have been studied at some later date when the curriculum itself had been validated.

9. Since the curriculum itself was only a concept but not a reality when the program started, the orientation given to the parents of these children had to be a vague presentation of a theoretical model. This orientation was given to the parents at a group meeting several weeks after the program was under way. Essentially, the initial orientation given to parents prior to the start of the semester was simply that the school would seek to help their child become a more efficient learner. Even after the orientation meeting which was held to discuss the general theory the parents held only a vague impression of the program. A detailed and specific orientation to the curriculum in terms of observations to be made by parents and of techniques that might be employed by parents would have enhanced the general experience for all concerned.

10. One of the major problems encountered might be classified as "setting the task above the level of the children." Many activities which appeared quite simple when first conceived proved to be beyond the capability of the children. For example, when tachistoscopic presentation of geometric forms was introduced the

setting was established at the slowest possible rate for flicker presentation. This proved to be too quick an exposure for any of the children to manage and set in motion a variety of negative reactions. Producing the geometric forms on cardboard to six times the projected size and having the teacher mask the card and then expose it for several seconds proved to bring the task to a level where the children could perform with success. Eventually the children were able to tolerate the speed of the tachistoscope and performed quite well.

Since the learning tasks presented by the teachers had not been previously tested on these children certain assumptions of simplicity had to be made. Despite careful planning and analysis of demand, the presentation of the activity would frequently reveal that the plan had over-estimated the children. While the incidence of over-estimation gradually diminished as the teachers became more sensitive to levels of operation ON THESE DIMENSIONS many anxious moments occurred during the early time" to find ways to present activities which of adjustment can be classified as a "searching stages of curriculum development. This period did not demand skills which were undeveloped in the child. It cannot be emphasized too strongly that this was a *necessary* process. The teaching staff soon learned to "take nothing for granted." The simplest tasks of looking at a target, shifting fixation from one target to another, walking to a drumbeat, listening while in motion, and so on, were found to be extremely difficult for most of the children. While the task itself appeared uncomplicated, the teachers were continually forced to restructure simple tasks to levels of greater simplicity. Despite average intelligence and controlled behavior, the most primitive skills in sustained viewing, rhythmic movement, body balance and so on, were beyond the skill-level of the children. While the "searching for levels" proved an extremely enlightening experience both for the understanding of the individual children and for the meaningful development of the curriculum, it was felt that much of this could have been avoided by a more detailed study of the children IN TERMS OF THESE DIMENSIONS prior to entry into the program.

11. In the older group three boys were dropped from the class during the course of the first semester. The first boy dropped perceived the situation to "be like kindergarten" according to his own words and this became the signal for him to hold the center of attention by a variety of dramatic gestures. It became apparent after several weeks of the class activities that this particular approach would not produce favorable results for this boy. The simplest visual activities were beyond his ability and each programmed activity which he could not perform produced an outburst of histrionics so disturbing to the class that any semblance of order was shattered. After attempting a variety of motivational techniques to ameliorate his effect upon the group, it became clear that the teacher was devoting 90% of her time to dealing with his histrionic outbursts and only 10% to the development of curriculum. Under these circumstances it seemed advisable to discontinue his enrollment in the class and to seek an individual tutorial approach to his problems.

Two brothers were enrolled in the same class in regular school and doing equally poorly in academics. Their enrollment as a pair in this class was an initial mistake. Their "brotherliness" proved to be a negative. After the boy described above was discontinued it seemed to provide a signal for the brothers to "act up." Shortly before Thanksgiving 1964 the older of the two brothers was accepted at the Wisconsin Diagnostic Center in Madison for six weeks of residential study regarding possible diagnosis of emotional disturbance. This request for such study antedated the establishment of the experimental class by some six months. In the interest of achieving the best possible analysis of this boy's problem, it was agreed to excuse him from the experimental group for this six week period. The decision to continue his twelve month junior brother in the program during his absence also proved to be a mistake. The previously described transportation arrangement was the focal point for this problem. The younger brother managed by a variety of means to "miss" the taxi which regularly called at his home on Tuesday and Thursday mornings. He was not absent from his regular school on those mornings but avoided the trip to the Learning Disabilities class. Occasionally he "made" the cab and attended the experimental program. Attendance of one in each five sessions scarcely provided any continuity to his program.

When the full case was reviewed with all school personnel involved it was agreed that it would appear to be in the best interests of the two brothers, the teachers, and the experimental program to discontinue their enrollment in the S.L.D. program.

One boy in the younger group persisted in finding ways to destroy materials, attack the teachers, run into the hallway, disrupt other classrooms in the building and generally created a state of chaos among the group. His verbal explanation for his behavior came in his own words demanding his release from "this silly gym class." After eight weeks of attempting to cope with these behaviors achieved only moderate success, it was generally agreed to accede to his wishes. He returned to his regular classroom full time.

When the three boys were dropped from the Tuesday-Thursday group a nine year old girl was added after the Christmas recess bringing this group to total of four girls. No children were dropped or added to the five and six year old group during its period of operation.

12. The three-hour program for the Tuesday and Thursday groups proved to be too lengthy a time span. Much of the program was devoted to vigorous activity and this was tiring for the children. Despite the fact that they were in a comfortable and understanding environment, the concentration of activity along dimensions which were difficult for them placed them under a mild form of continuous stress. This also proved exhausting to them. Three periods per week of two hour sessions for the Monday-Wednesday-Friday groups seemed to produce far less fatigue than the two three-hour sessions. Although the three hour time period was identical to the time they spent in their regular classes the difference can be attributed to performance demand. Attempting to improve areas of difficulty can be very exhausting.

Positive Aspects

In addition to the gains which have already been described under each of the dimensions, a set of general positives can also be defined.

1. A remarkable change in level of confidence occurred for all of the children. At first they were reluctant to try some of the activities voicing various protestations or manifesting a variety of negativisms. Progressively they began to gain (or regain) confidence in their own abilities and approached tasks with an air of certainty for success. As they began to find success their confidence levels increased. All had a lengthy history of failure and had come to view themselves as "unsuccessful" learners. Finding success in a tolerant atmosphere bolstered their confidence. Each began to accept new tasks and new situations with less and less reluctance. As they learned more and more about themselves and how they could operate successfully in space, they began to engage in a greater amount of exploratory behavior with the equipment testing themselves and practicing in various positions of balance adding their own complications as they explored. It was a very gratifying experience to watch each child "achieve his own level of confidence." For several children the change began to occur early while for others it did not truly begin until the second semester. One of the major gains for the children must be classified as a positive change in self-concept. They came to view themselves as "achievers" instead of non-achievers. Despite the fact that their achievements were minor, gains in knowledge of body balance, movement to rhythm, achieving quietness, and so on, these accomplishments contributed to building an image of success.

2. Among the positive findings of the program, the development of an awareness among the children that they were "receiving help" to learn must be listed as a gratifying experience. Alone in their "image of failure" the children began to understand that the program had been designed "for them." The realization that the experimental room was a place of help came at varying time periods for the total group but all achieved such realization as the year progressed. They discovered that there were ways to improve their performances and that the ways were available to them within this program.

3. In spite of the many negative factors of strangeness, differing levels of performance, different schools and so on, each of the group did achieve a "group feeling" and an identification as a group during the course of the year. They learned to respect each others' problems, to make allowances for outbursts, to share each others' successes, and to help one another in many ways.

4. An important positive feature was related to the teachers. After an initial period of personal orientation they began to find increased excitement in the creative opportunity to contribute to the planning. All four teachers regarded the experience as a significant period of professional development and thoroughly en-

joyed the experience of finding veins of creativity within their own makeup that exceeded even their own expectations. They progressively felt more comfortable as they moved along. The opportunity to work with children at varying levels in a unique setting while presenting many problems turned out to be a richly rewarding experience.

5. An important discovery made by the children was the possibility of learning arithmetic, reading, spelling, writing, and so on, in a different way than they had been accustomed. Since they had consistently failed in their efforts to learn efficiently in the regular classroom, the novelty of the activities in this experimental room became a continuing source of discovery for them. Their early reactions were those of disbelief when the teachers suggested that these activities might bear some relationship to their regular school performance. One of the most gratifying experiences of the whole year was the progressive buildup of discoveries among the children of the relationship between the experimental activities and their regular school work. Whereas the early period was given to the teachers pointing out relationships, the teachers soon found that the children themselves began to discover more and more relationships without teacher suggestion.

6. There proved to be considerable merit in the simple discovery among the children that there were others who had problems similar to their own. The knowledge that they were "not alone" in their difficulties helped to eventually build a group identity.

7. The total atmosphere of the class was a positive one. There was a general feeling of "we are getting better" and the possible stigma of identifying the class as a segregation of "failures" was avoided for the group by the progressive enthusiasm generated by the teachers and the children themselves with almost a daily inventory of improvements which they could identify.

8. At the start of the program the teachers wore black slacks and white blouses. Some thought was given to the general notion that neurologically impaired children might be negatively affected by distracting colors so the uniform was maintained for several months. Once the basic uniform was established it was decided to try other colors in clothing to determine possible negative effect. From that point on teachers wore a variety of colored slacks and blouses. No significant changes in behavior were found among the children which might in any way have been attributed to the distractibility caused by teacher garb.

9. The teachers increased understanding of each child's stress tolerance level was regarded as a positive. Providing specific activities in which the demand placed upon the child could be defined in terms of a dimension enabled the teachers to establish a pattern of stress for each child. In one child any demand for tachistoscopic perception produced negativism and aggressive behavior. In another, the demand for performance in balancing activities produced evasions, much tangential conversation, and wandering attention. Each child had several areas which were so difficult for him that the inherent stress evoked behavioral negatives. A child, for instance, was not consistently negative but rather *sporadically* negative according to the demands being placed upon him. Children with learning problems must be negatively reactive in some manner when a performance demand is made which they cannot fulfill. Understanding that a child was "acting up" because a visual demand had been made which exceeded his ability in visual processing provided a base to be used in planning other activities in the visual area which would be less demanding. Each child presented a different stress level in 12 different dimensions. Activities which demanded performance above the respective skill level inevitably yielded negative behavior of some sort.

10. The parent counseling program proved to have great value. It served as a vehicle to orient parents more precisely in the objectives of the program. The discussion periods helped the parents to learn methods which they might employ in the home situation which might contribute to and enhance the child's learning in the classroom. The sessions were also used to help parents understand the general nature of their child's problem and particularly their own parental relationship to those problems. General topics related to parent-child relationships were also discussed.

11. The most significant positive finding was related to the curriculum. What started as an idea was given form in a practical setting. Sequences of activity were defined, equipment was

obtained, and a curriculum did emerge. The original pencil sketch was filled in with color and shading to produce a product. Children enjoyed the organization of activities, teachers enjoyed the planning, and the total experience was a gratifying one for all concerned.

Summary

In summary, the *negative findings* may be listed as:

1. Variability of school identifications
2. Transportation time schedules
3. Wide range of performance levels
4. Absence of a communication pattern between regular teachers and the experimental program
5. Inadequate personal orientation for the children regarding their "special placement"
6. Initiation of full group program on the first day of school
7. Absence of test information prior to the program
8. Lack of proper sophisticated orientation for the teachers
9. Failure to conduct an adequate orientation for parents
10. Difficulties in ascertaining levels of performance adequacy on the twelve dimensions
11. Need to discontinue some children
12. Too lengthy a time span for the Tuesday-Thursday group

The summary of the *positive findings* encompasses not only the 11 points discussed previously but also the improvements noted under each dimension:

1. All children increased their muscular strength.
2. All children became more efficient in dynamic balance.
3. Improvements were generalized in spatial awareness.
4. All gained an increased awareness of their body and its functional properties.
5. Some gains in visual efficiency occurred for all.
6. All children became more efficient in listening and gains were noted in language formulation and expression.
7. Children acquired some understanding of a "feel for movement."
8. Tactual processing was improved.
9. Each gained an increased awareness of *both* sides of their bodies.
10. All learned to move according to a given tempo.
11. Rigid behavior decreased and children demonstrated greater flexibility of response.
12. Children learned to plan their performance.
13. Each child increased his confidence level in his own performance.
14. All but one became consciously aware of "receiving help."
15. A group identification was achieved in each of the three classes.
16. Teachers exercised high creativity and extended their competence.
17. Children discovered "new ways to learn."
18. Children became aware of each other's problems and benefited from this commonality.
19. An atmosphere of "improvement" was the prevailing mood.
20. Teacher garb proved to have no significant negative effect.
21. Levels of stress tolerance were defined to account for behavioral upset.
22. The parent counseling program provided a valuable asset to the program.
23. **THE CURRICULUM WAS ESTABLISHED.**

No quantitative measures can be assigned to any of the positives listed above since no effort was made to assess change on a numerical basis. Each child gained from the experience. Some gained much more than others. Within each dimension children varied widely from one another. From dimension to dimension each child revealed a wide range of performance levels within himself. At no point could a measure of equal gain be considered. Although each child gained some form of improvement on all dimensions, the amount of gain in each dimension was not a consistent increase. Variability in progress was the typical finding. A precise effort to quantify change is part of future planning.

The positives far outweigh the negatives. The negative findings were essentially administrative in nature and detracted only from the smoothness of operational efficiency. Such findings are correctible in future planning. Those who seek a quantitative definition of change will undoubtedly add such an omission to the list of negatives. The positive side of the ledger is most gratifying.

Children were helped. Even though some children had to be dropped from the program for behavioral reasons, they were not considered to have failed. Their discontinuation occurred as a protection to the original goal of the curriculum. It is still felt that these children could profit from the MOVIGENIC CURRICULUM at another time, in a different cluster, and perhaps another location.

The positives yield a significant sum. This summation indicates that a movement-oriented efficiency supplement to a regular curriculum holds promise of making a significant contribution to the optimal achievement of children with learning disorders. This is an important first step!

SECTION VII
FINAL SUMMARY AND FUTURE PLANS

The original objectives of this experiment was the establishment of a curriculum. Activities organized in sequence and programmed to build efficiency in twelve dimensions of performance have emerged from the year's experience. The curriculum has in fact been achieved according to the theoretical framework of MOVIGENICS.

There are probably many effective approaches to resolving the learning problems of those children who fail to conform to academic expectancy. The MOVIGENIC CURRICULUM is but one of these approaches. Other theorists may be equally enthused about their own respective approaches and the nation's educators will have to select on the basis of children, community, and their own bias.

At this point in its development the MOVIGENIC CURRICULUM is classified as a *supplement*. It is recommended for use in conjunction with an existing curriculum. As such it can be considered as supplementary to a curriculum in regular elementary or secondary schools, classes for deaf, blind, educable or trainable mentally retarded, emotionally disturbed or other existing programs.

To properly evaluate the year's experience it is necessary to avoid a traditional point of view. Usually an experimental program is judged in terms of how much gain occurs in the achievement level of the experimental children. While it is certainly true that many gains were noted among the children, the precise evaluation of those gains was not the intent of this study. The real experimental subject in this case was the CURRICULUM. The study was designed to determine whether a program of activities based upon a specific theory could be organized and activated in a group setting. Once the experimental model had been actually constructed and developed, a second step could be directed toward a more precise study of child change. Consequently, *this report is devoted to the first step*. Those who seek detailed answers to the second step will be disappointed. Our investigation questions were "curriculum" and "teacher" questions. Next year, searching out the answers to "child" questions will become the major goal.

While there is no hesitation to declare that the original goal was achieved — a curriculum was defined — there is no intent to promote the belief that the MOVIGENIC CURRICULUM is not without fault or blemish. It is not yet polished, refined and matured. The first year must be viewed as a gestation period — a time of incubation and development. It needs to be replicated in other settings, by other teachers, with different children, and so on. It needs to achieve some independence. It must seek its identification among other curricula in the field of education.

In retrospect, the list of positives is grayed by the list of mistakes in judgment, timing and selection of equipment and children. Hindsight is notoriously more accurate than foresight and all experimental procedures fortunately are cast in an original mold of speculation other than certainty. Experiments are intended always as sequences with subsequent experiments structured to correct the errors in previous trials. So it is with the MOVIGENIC approach.

Phase Two: Experimental Test of the Curriculum

The second stage in the program is designed to study the progress of children as the major investigative variable. In order to acquaint educators with the second stage, the outline of the 1965-66 experiment is described below:

Selection Procedures

1. Approximately 70 children between the ages of six and twelve will be nominated by the Madison School System as potential candidates for the Special Learning Disabilities classes of 1965-66. These nominations will be governed by such factors as academic failures, behavioral management problems, psychological tests, and so on.

2. All children will receive a comprehensive test battery consisting of the:

Wechsler Intelligence Scale for Children
Illinois Test of Psycholinguistic Ability
Frostig Test of Visual Perception
Oseretsky Motor Scale
Movigenic Movement Scale
Academic Achievement Tests

These tests will be administered during June and July to all possible candidates.

3. Test profiles and all pertinent data available from the school records will be analyzed to define 18 "matched pairs" of children. Matching criteria will include as many factors as can logically be brought into twin relationship after careful analysis. The matched pairs will then be split into control and experimental groups.

Class Participation

The 18 experimental children will be divided into three groups and enrolled in the classes for Special Learning Disabilities. The 18 Control children will continue their full-time attendance in their regular classrooms without special help.

School Affiliation

To avoid the transportation problem encountered in the first year and to somewhat improve the identification feeling among the children, all experimental group children will be formally enrolled full time in the elementary school which houses the special room.

Teachers

The same teachers will be employed in the second phase of this project.

Parent Groups

Parents of the Experimental Group children will be assigned to counseling groups at the onset of the program and continue throughout the year. Parents of the Control Group will receive no specialized service.

Regular Teachers

The regular elementary teachers who have these Experimental Group children in their rooms will meet at regular intervals with the experimental teachers and the Project staff to discuss progress of children and receive a current orientation to the Movigenic Curriculum.

The Curriculum

The curriculum model established this year will guide the daily programming with a number of contemplated innovations.

APPENDIX I
DESCRIPTIONS OF ACTIVITIES

Each activity is presented in a variety of gravitational positions. In some instances a specific position is mandatory for the execution of the exercise and is indicated in the instructions. IN ALL OTHER CASES the teacher presents the activity to the children in as many as possible of the following positions: PRONE, SUPINE, SITTING ON THE FLOOR, KNEELING, SITTING ON A CHAIR, STANDING, WALKING.

In describing activities for each of the twelve dimensions some overlapping is inevitable between sub-divisions. Although some overlapping occurs, the sub-divisions are maintained to give emphasis to goals. In addition, *the reader will note that neither Flexibility nor Motor Planning are included within the description of activities.* The project director and his staff were of the opinion that insufficient planning and classroom tryouts in these two areas prevented the development of a comprehensive listing of exercises and activities in the final two dimensions. Moreover, Flexibility and Motor Planning skills are inherent in each of the other ten dimensions. A more definitive development of these two final dimensions will be forthcoming at a later date.

When performance on these exercises seems to be skilled, further proficiency may be achieved by combining the activity with a cognitive task. For example, rail walking and visual tracking may be combined with arithmetic or spelling problems; teeter boards may be used while the children are learning a new song; Children may walk or run to the rhythm of a poem being read aloud to them.

These represent a *random* and *partial* selection, and the creative teacher may devise many other activities equally appropriate and effective.

Many of these activities must be approached gradually, while others may seem too simple for certain children. The teacher must constantly seek to evaluate the child's levels of skill in a particular dimension and progress accordingly, in the most flexible and efficient manner.

Dimension I — Muscular Strength

Exercises for pulling:

1. Rope Pull. Teacher and child (or two children) grasp opposite ends of a six foot rope. They see-saw back and forth. Emphasis is placed on the give and take rather than on the strength of the pull.

2. Tug-o'-war. A "rope pull" with one or more children at each end of the rope and with greater emphasis on strength of pull.

Exercises for lifting:

3. The child walks across the room toward a designated visual target, carrying a chair at a comfortable height and close to his body. This may be varied by having the child carry a box containing one or more books, or any other objects of varying weights. Emphasis is placed on posture and on the utilization of leg muscles for proper lifting.

4. The child lies in a prone position with his legs straight and a two foot board is placed across his shins, close to his ankles. Legs are lifted off the floor to a minimum height (2-3"). Strength is gained through repetition. Boards of varying weights may be used.

Exercises for pushing:

5. Sitting push-ups. Seated on a chair, the child places his hands at his sides and grips the chair seat. He straightens his arms and lifts his body just off the seat. This extension is alternated with relaxation.

6. Isometric Thrusting. The child is seated at a desk or a solid table. He places his hands on the desk or table edge in front of his abdomen and pushes, tensing his body. Thrusting (tensing) and relaxing are alternated.

7. Backward push. The child sits on the floor with his feet drawn up, knees bent, and palms flat on the floor and a little behind him. Using his legs to push and his arms to support, the child slides backwards across the floor. (This may be done lifting the buttocks slightly off the floor, to give added exercise to arm and shoulder muscles.)
8. Push-ups.
9. Isometric exercises. (Isometric exercises involve exertion of full muscular force pushing or pulling against a fixed resistance.)

General Exercises:

10. Use any good exercise record and have the children follow the directions.

Dimension II — Dynamic Balance

Exercises to aid in recovery:

1. Child imitates animal gaits such as duck waddle, bunny hop, frog jump.
2. Three types of teeter board are used to balance, teeter and regain balance. Boards are used prone, supine, sitting, kneeling, standing. The smallest board is used for standing. The middle-sized board is used in all positions except prone and supine.
3. The child sits on a chair and lifts one side of his body, leaning as far as he can without losing his balance, then returns to a sitting position. He alternates sides.
4. The child moves about in a darkened room learning to avoid obstacles placed in his path. At times the obstacles are familiarly placed in his path. At times the obstacles placed; at other times they are randomized.

Exercises to maintain alignment:

5. The child walks back and forth on a walking rail with tilted side boards, keeping his eyes on a designated visual target. This is varied by the introduction of a rhythmic beat provided by a metronome (begin at 44); by the addition of a light object such as a paper plate balanced on the child's head; by teacher instructions to vary direction (e.g., "take three steps back and five steps forward") without losing the beat. A visual target is held at all times and may be varied to include up-space, down-space, side and peripheral-space.
6. The child lies prone on a short 2" x 4" walking rail. He balances with feet and hands, then moves his arms until they are perpendicular to his body, continuing to hold his balance. Next, he tries to maintain balance spreading his legs apart and holding arms perpendicular to his sides.
7. Seated on the floor with his knees drawn up to his chest, his feet off the floor and his hands on the floor, the child pivots on his buttocks trying to make a complete turn with one or two thrusts of his hand against the floor. He pivots in one direction and then the other.

8. The child jumps up and down on a Harmon Jump Board. He tries to stay in the middle and counts how many times he can jump before falling off the board.

Exercises to sustain transport patterns:

9. To the beat of a metronome or a tom-tom or to music played on a record player, piano or other instrument, the children walk, run, gallop, slide, hop, do scissors walk, walk on tip-toe and so on. This movement may be performed on a large square or circle painted on the floor or the child may move freely about the room.

10. The child performs the same exercises described in item "5." of this listing. In this case, however, he is on a walking rail made of a long 2" x 4".

11. On a low "scooter board" (board is approximately 12" x 14" and is on four roller-skate-type wheels) the child moves about freely. Over an extended period of time he learns to maneuver on his stomach, back, knees or seated. Eventually he can follow patterns painted on the floor or an obstacle course.

Dimension III — Spatial Awareness

1. *Rotation in space.* Children stand on a line an arm's length apart. The teacher instructs them to "turn right" or "turn left." The teacher participates, first facing away from them.

   This exercise may be varied by having the children lean as far as possible to the right or left without losing their balance.

   A further variation requires the teacher's participation. With her back to the group, and moving according to her own instructions, she calls out directions such as: "turn to the window, this is a quarter turn"; "turn to the chalk board, this is a half turn"; "turn to the clock, this is a three-quarter turn." After a while she limits her instructions to "make a quarter turn to the left," "make a half turn to the right," etc. Eventually the children are able to follow directions without watching the teacher.

2. *Labeling directions in space.* Children sit, stand or kneel on the floor or on a mat. Following the teacher's directions, they point up, under, to the side, between, above, and elsewhere in relation to parts of their own bodies. For example, "*between* your shoulders," "*under* your legs," "*over* your head."

3. *Basic lateral patterning in space.* Lying on the floor, first in a supine and later in a prone position, the children are taught to imitate the infant tonic-neck-reflex position. In this position, the head is turned to one side, the arm and leg on this side are extended and the arm and leg on the other side are flexed. To a rhythmic beat supplied by the teacher's voice, a tom-tom or a metronome, the child reverses the position, returns, reverses, then returns again, etc. (If coordination is difficult the child moves head alone, then adds arms and finally adds legs.)

   When patterning has been well-organized the children do the same thing with cross patterning (left arm and right leg are extended, while right arm and left leg are flexed and vice versa.)

4. *Visualization of space.* Children sit blindfolded and attempt to describe the position of various objects in the room. A similar game may be played by placing objects on the table, closing eyes and recalling their identity and position. Or eyes may be closed while the teacher removes one or more objects and then, with eyes open, the child recalls objects that have been removed.

5. *Reorganization of space.* As a group, the children practice rearranging the furniture in the room in the most utilitarian and convenient manner. To extend such skills the teacher may pattern various materials such as geometric forms, word lists, floor designs, parquetry designs, etc., into fixed designs and ask the children to create a new pattern using the same materials. This moves the children from the physical to the symbolic level of performance.

6. *Reproduction of design in space.* The teacher makes patterns on the chalk board or on the table using chalk designs, mosaics, tinkertoys, poker chips, blocks, etc. The children must reproduce these schema.

7. *Rolling in space.* Across a rug on the floor, the child rolls to the count of four. At the count of one, he lifts his head, at the count of two, he begins to turn his shoulder, at three, he raises his hips and at four, he completes the roll. The synchronization of the four count sequence is vital to the skill.

8. *Variable transport in space.* The entire room is used for walking, running, etc., in many directions. One exercise has the children stand in a row with hands on each other's shoulders. At the teacher's command they move forward, backward or sideward as a group.

Any activities which serve to bring children increased awareness of up, down, side, back and forward space may be included under this dimension.

Dimension IV — Body Awareness

Exercises to develop body image:

1. "Simon Says" and variations. For younger children simple identification by touching is sufficient. When the traditional "Simon Says" game is used the child who errs is eliminated for only 30 seconds, thus bringing him back to a needed activity.

   Other variations include moving the identified part instead of touching it; moving or otherwise identifying body parts in prone, supine, and other positions; imitation of teacher's movements without verbal instructions.

2. Figure drawings may serve as exercises as well as tests. Such drawings take on added significance when they immediately follow a game such as "Simon Says."

   A popular and meaningful variation has the child lie outstretched on a large piece of wrapping paper. The teacher traces around the child's entire body and then the youngster completes the picture with crayons or paint.

3. Children do "shadow plays" using a light behind a hanging sheet or the light cast on wall or chalk board by a slide projector.

4. Finger plays such as "Open, Shut Them," "Where is Thumpkin," "Five Little Squirrels," etc., are used with the younger children.

Exercises to appreciate function of body parts:

5. Relaxation. Children lie on the floor listening to quiet music and try to feel "heavy." They become completely relaxed.

6. In an imitation of rag dolls the children walk about with heads down and loose movements of legs and arms.

7. "Follow the Leader." This may be played in a fixed place as in "Did You Ever See a Lassie" or in a moving line that follows a child or the teacher around the room.

8. The teacher instructs the children to move various body parts such as the toe, foot, hand, etc., and to tell where they felt the movement originate.

9. The teacher asks a series of questions such as What do you see with—What do you walk with.

Dimension V — Visual Dynamics

Exercises for visual steering:

1. Visual targets are used at all times for crawling, rolling, walking rail and walking beam, whether child is moving forward, backward or sideways.

2. Bean bags are thrown at designated targets using alternate hands.

3. Visual steering is a component of many of the exercises that follow.

Exercises for visual tracking:

In these exercises it is particularly important to vary the child's position. (Please see page 45.)

4. Following the teacher's direction, the child focuses on lines, light fixtures, etc., on the ceiling or the walls. Instructions are given so that tracking is vertical, horizontal, diagonal, back and forth.

5. Exercise "4." above is varied by tracking a flashlight beam in a darkened room. Added interest is gained by having the child track the first light beam with a second light of a different color.

6. A ball on a string is suspended from the ceiling, preferably on a pulley so that it can be raised and lowered. Starting the ball approximately 18 inches from the child's eyes, the teacher swings it slowly, alternating vertical, horizontal and depth axes, and a circular motion. The child holds his head still and focuses on the moving ball.

   This may be varied by having the child hold a cardboard roll in both hands and hit the ball gently as it comes toward him, always keeping his eyes on the swinging ball.

7. Using templates, the child traces designs on the chalk board or at his desk again using alternate hands. As skill is developed this activity is performed to a rhythmic beat.

Exercises for sustained attention:

8. Exercises described in Dimension II (Dynamic Balance), numbers "5." and "10." emphasize sustained attention to a visual target.

9. In a darkened room the child is told to look straight ahead. When he sees a light beam fall on a spot in the room he is to look at the light. He keeps his eyes on this spot until the light again changes to a different point. Each time the light changes he fixates until the next change.

Exercises for visual shifting:

10. Finger jumps. The child closes his hands into fists with the thumbs straight up. He holds his hands about 14-18 inches apart and about 12 inches in front of him. On signal, and keeping his head still, he moves his eyes back and forth from one thumb to the other.

11. The child holds his thumbs up as in exercise "11." and keeps his hands close together. On signal, keeping his head still, he moves his eyes from his thumbs to a designated far point in the room and back to his thumbs.

12. Sitting on the floor in a group or a circle the children look at designated points in the room as rapidly as possible as the teacher calls them out.

13. The children view slides presented tachistoscopically (or cards held by the teacher) with geometric figures, dominoes, tic-tac-toe designs, etc. (see Lyons series, P.A.S.S. series). The child looks at the slide (or card), then draws the form he has seen on his paper or on a tracing board with a tracing pencil. The teacher varies the position of the projector (or the card) to points at eye level, above or below eye level.

    Children may work at desks or on the floor.

    Exercises may be performed with alternating hands.

Exercises for visual memory:

14. The exercises described in number "14." above are performed with a quick viewing of the slide or card followed by a brief pause with eyes closed, before the object is reproduced.

15. Games and discussions are held with the children that center about questions such as What color is a lemon—Tell me something that is blue—Which is bigger, a tree or a mouse—a cat or a bear.

16. A number of small objects are displayed and then hidden. The children recall what they have seen.

17. A number of objects are displayed and eyes are closed while one or more items are removed. The children open their eyes and identify the missing objects.

Dimension VI — Auditory Dynamics

Exercises for expressive audition:

1. Sitting in a circle or in a group on the floor the children create and imitate babbling sounds such as "mamamama," "tif-tif-tif-tif," "cluck-cluck" and so on.

2. After a child has had experience with any one of the activities used in the classroom, allow him to direct the activity for the other children, learning to modulate his voice according to the group needs.

3. Group singing. The children sing together with or without the support of the teacher's voice, a musical instrument or the record player. New songs are learned by singing along.

   Variation is introduced when the children are told to sing only a specified word, phrase or chorus of the song.

4. The teacher plays a simple rhythmic pattern on the drum and the child repeats the pattern.

5. Formal or informal conversations are held with the emphasis on listening and on being listened to.

Exercises for receptive audition:

6. Children take turns wearing a "Train-ear" which can bring sound to both ears simultaneously or to one ear at a time.

7. Children sit in a circle with each child holding a bell and a blindfolded child in the middle. The teacher points to one of the children in the circle and he rings his bell. The child in the center points to the source of the sound.

8. Bells on elastic bands are placed on children's ankles. They walk in designated directions, making squares, circles, etc.

9. Children follow directions in songs such as "Alouette."

10. Listening games. The child is expected to identify the source of sounds. This may be done by sitting quietly and listening to and identifying the usual school noises. It may also be done in the dark with a soft musical background.

    In another variation the child lies on the floor in the dark and the teacher deliberately makes sounds to be identified. Some suggestions are: writing on the chalk board, writing on paper with a pencil, cutting with scissors, jingling keys, opening and closing a zipper, moving a chair, etc.

11. The children listen to stories and then discuss them.

12. The children listen to songs in foreign languages. At times the children are asked to identify English words embedded in these songs.

13. Directions for any activity may be given in a variety of "voices" by varying the pitch and intensity of the sound.

14. The children are asked to pair "sound boxes" by shaking them. Boxes contain various materials which make contrasting sound. Contrast progresses from gross to fine over the course of the school year.

Dimension VII — Kinesthesia

Exercises for gross movement patterning:

1. TNR. The exercise described under Dimension III—Spatial Awareness, number "3.", is basic to movement patterning.

2. Angels in the Snow. In a supine or prone position the child pretends to be making an angel in the snow by sliding arms and legs out and in in a synchronized rhythmic pattern.

3. Rolling. The exercise described under Dimension III—Spatial Awareness, number "7.", is basic to movement patterning.

4. Homologous crawling. Using a low visual target the child crawls across the room using both hands simultaneously and pulling the lower part of his body along.

5. Homolateral crawling. With a low visual target the child crawls across the room using his right hand and right leg simultaneously and his left hand and left leg simultaneously.

6. Cross diagonal crawling. With a low visual target the child crawls across the room using his right hand and left leg simultaneously and his left hand and right leg simultaneously.

7. Children walk, run, gallop, etc., to music or to a rhythmic beat.

8. Exercise number "8." under Dimension IV—Body Awareness helps to develop gross motor patterning.

9. The teacher sets up an obstacle course using chairs, tables, jump boards and anything else that is available. The children crawl over and under, sit and stand, jump on, off and over and so on.

10. Sitting on the floor the children simulate rowing movements. With arms and legs in motion they move forward and backward.

11. The children write numbers or letters in the air with fists, elbows and feet.

12. The child sits on the floor or on a chair with his feet raised. A ball is hung within reach of his feet. He kicks the ball with one foot at a time or with both feet at the same time.

13. Broad jump. The child stands with his feet together and jumps as far as he can without losing his balance at the completion of the jump.

14. The child jumps off the jump board retaining balance upon touching the floor. Later, an obstacle course is set up for jumping over obstacles of varying heights.

Exercises for fine movement patterning:

15. Children fill peg boards.

16. Children cut with scissors, first freely and later along designated lines.

17. Children blow bubbles. As they grow skilled in making them they follow them with their eyes and catch them on a wand or poke them with their fingers.

Dimension VIII — Tactual Dynamics

Exercises for active touch:

1. The child distinguishes articles by handling them, first with both hands and later with one hand at a time. The object being identified is hidden from sight. It is felt inside a box with holes cut in the sides or by a blindfolded child. Objects are grossly different at first but differences become finer.

   Objects used may be small toys, household objects such as buttons and pins, school supplies such as chalk and crayons and so on. Later the child may be asked to distinguish geometric shapes, cut out numbers or letters.

2. The blindbolded child must catch similar patches of material. He distinguishes silk, flannel, linen, etc.

3. Various objects of differing texture and shapes are passed from hand to hand without looking. The children identify silently while the teacher asks Is it cold—Is it soft, etc. Children give *themselves* the answer to the teacher's questions.

4. Dried beans in a large box are handled and manipulated with small containers, spoons, funnels, etc. This may be used with many variations:

   Small objects are hidden in the beans and found by a blindfolded child.

   Bare feet explore the beans.

   Bare feet find hidden objects.

   Hands or feet are covered and hidden in the beans.

5. With bare feet, children walk on objects of different shape, size, or texture, such as sand-paper squares, carpeting squares, rubber pads, etc., identifying similarities and differences as they touch each.

Exercises for passive touch:

6. The child lies on the floor in any position that he may choose and the teacher uses a feather or a brush to stroke or touch various parts of his body.

7. The teacher touches various parts of the child's body with a pointer. The child identifies the part touched by naming or touching.

8. In a row, the children write numbers on each other's backs and each child identifies the number he feels. This may be varied by having the children "pass on" numbers and the first and last child tell the number used.

Dimension IX — Bilaterality

1. Child hops around a circle, first on one foot and then on the other.

2. With a piece of chalk in each hand the child positions himself facing the chalkboard. He extends both arms to approximate height of his eyes in position for writing. He can repetitively make circular motions, lateral or vertical lines with both hands simultaneously. This exercise may be varied by introducing a metronome or tom-tom beat.

3. At the chalk board the child draws the outline of a template, holding the template up with one hand and the chalk in the other. Then he reverses hands and repeats the procedure.

4. Standing in a row, the children imitate the teacher's bilateral arm and leg movements. When some level of proficiency is achieved the exercise is done in rhythm. Later it may be done on the teeter boards or the walking rail.

5. An area on the floor is marked off into four squares. One child stands in each square and a ball is bounced or hit from one square to another. The ball must land in one of the squares and the players continue to hit or bounce it to each other.

6. Many of the exercises listed under other dimensions are performed with alternating hands, arms or legs and then with both sides simultaneously.

Dimension X — Rhythm

1. In a room where there is ample floor space, children are told to remove their shoes. (a) Children listen to the metronome and walk quickly or slowly in response to the beat. Or (b) children are told to watch the metronome light and respond to the rhythmic beat. Or (c) using voice or musical instrument, the teacher joins a series of songs with an improvised story line and the children respond to the varied rhythmic patterns in the music. Or (d) children are told to change the movement of their bodies as the beat of the tom-tom or piano changes. Some possible combinations for this variation are: walk and run, run and jump, walk and skip, walk and gallop, jump in place, then run.

2. Children walk, skip, run or gallop to the piano or tom-tom. They are told to stand still when the beat or the music stops. This may be used as an elimination game but the teacher is advised to eliminate the best performers first to give practice to those who need it.

3. Children sit in a group and sing together. As they sing they clap hands, tap feet, tap other parts of their bodies with either or both hands, point to a series of objects designated by the teacher, count aloud in place of singing words, say the alphabet instead of the words, etc.

4. Children walk to the beat of a poem spoken by the teacher or spoken in unison by the children.

5. The teacher beats out a simple pattern on the tom-tom and the child is asked to repeat it. This activity builds from extremely simple patterns like two or three equally spaced beats to complicated patterns like da-dit-dit-da, da-dit-dit-da or da-dit-dit-dit-dit, da-dit-dit-dit and so on.

6. The teacher reads poetry aloud to the children.

7. Children dance to recorded music. Dance should be free and spontaneous. If the teacher is comfortable participating, it encourages the children to relax—especially at the beginning. Props like scarves add to the enjoyment.

8. In any position that he chooses, the child is asked to initiate any rhythmic pattern he wishes to create. The rest of the group imitates his movements and the teacher then pick up the beat on an instrument, by singing or by clapping her hands.

9. Children maintain one rhythmic movement with their legs while their arms respond to a different beat. The children start to walk or run to the beat of the metronome. When the beat is well established they are told to move their arms to a different tempo. For example, walk to a 4/4 beat and move arms to a 2/2 beat, or run to a 6/8 beat and move arms to a 3/4 beat or walk to a 2/2 beat and move arms to a 4/4 beat.

10. Children are asked to stand, kneel, sit on the floor or lie down. They are told to imitate repetitive rhythmic movements made by the teacher or by another child. Imagination should be used to try to include every part of the body, e.g. tongue, shoulders, elbows, wrists, fingers, etc.

11. Sitting together on the floor the children learn songs and rhymes by hearing them from beginning to end without a pause. They join in as they can and learn by participating. The whole is never broken up for single line repetition. Songs and rhymes with a strong beat are stressed.

12. Children are given a variety of rhythm band instruments. Initially they are permitted to experiment with the instruments informally. Later children are seated on the floor or on chairs in a semi-circle. They play their instruments in unison with the teacher playing a strong role as she leads simple songs known to the children. The teacher stresses starting together, keeping in time, ending together. The children are told to play on the metric beat or on the syllabic beat. It will take time for them to be able to differentiate.

    At times the children may march around the room carrying and playing their instruments.

    Children who have already had elementary experience with the rhythm band are given experience with contrasts in tempo and volume and in part playing.

13. On a large piece of paper, holding a pencil in the right hand and using an overhand motion, the child goes from the left side of a piece of paper to the right side, making a circular spiral pattern in time to the metronime. Then repeat the exercise going from right to left and using the left hand.

    Zig-zag lines and other patterns may be made in the same manner.

APPENDIX II

SAMPLE PLANNING FORMS FOR MOVIGENIC LEARNING

DIMENSION I—Muscular Strength

NAME OF ACTIVITY Chair carry and weight lift

GRAVITATIONAL POSITION

x	Standing
	Kneeling
	Sitting on floor
x	Sitting on chair
	Walking
	Prone
	Supine

EQUIPMENT Chair, box, or objects of varying weight

PROCEDURE: The teacher establishes a visual target for the children, and they are instructed to walk normally, carrying a chair at a comfortable height. Children vary this task with lifting a box filled variably with one or more books. Emphasis is placed on posture and utilization of leg muscles for proper lifting.

ACTIVITY FORM FOR MOVIGENIC LEARNING

DIMENSION III—Spacial Awareness

NAME OF ACTIVITY Turns

GRAVITATIONAL POSITION

x	Standing on line
	Kneeling
	Sitting on floor
	Sitting on chair
	Walking
	Prone
	Supine

EQUIPMENT None

PROCEDURES: Teacher begins facing away from children and directs them to turn with her. Beforehand she choses points to which she may refer — "turn to window", (a quarter turn) — "turn to board", (half turn) — "turn to clock", (¾ turn). Then use terms ¼, ½, etc., still turning. Eventually, children turn alone. Then alternate direction "¼ turn left", "½ turn right", etc., working up to not needing to watch teacher.

ACTIVITY FORM FOR MOVIGENIC LEARNING

DIMENSION V—Visual Dynamics

NAME OF ACTIVITY Slides

GRAVITATIONAL POSITION

x	Standing
x	Kneeling
x	Sitting on floor
x	Sitting on chair
	Walking
	Prone
	Supine

EQUIPMENT Flashlight

Dark room

PROCEDURE: Child sits at the table with his tracing board in front of him. The slides are projected on the wall in front of him. When the leader says "Look", the child is to be sure he looks at the board. Then he draws the form that he sees on his paper. Teacher varies place of projection — above or below eye level.