FROM NON SENSE TO NEW SENSE

IN GENERAL AND ART EDUCATION

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A B S T R A C T

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BY

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This paper begins with the premise that, in our society, children as well as adults are experiencing increasing difficulty in adequatly coping with their environment.

In order to function in our rapidly changing society, man must be able to develop a flexible and creative "modus operandi".

A detailed examination of recent developmental studies in psychology, physiology, biology, and related areas suggests that the following conditions are necessary to develop a person's flexibility and creativity:

1. Sufficient and varied types of stimulation to develop the sense modalities.
2. Sufficiently developed sense modalities able to combine to form sensory systems.
3. Sufficiently developed sensory systems that can be united to form the higher cognitive functions such as language.
4. The preceding conditions must be encouraged in their development at certain specified maturity levels.

This paper maintains that, at the present time, educational philosophy is taking very little of this knowledge into account. Art education is in an ideal position to reverse this situation. Activities that incorporate the senses, the environment, and the child's developing cognitive powers are suggested. These are designed to develop in the child, the flexible and creative "modus operandi" which will allow him to fully realize his capacities as a human being.

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PREFACE

The aim of this paper is to show that, through his society and education, man is not only depriving himself of an important part of his potential development, but likely causing himself considerable harm.

This neglect stems in part from the underdevelopment of his sensory systems. How this underdevelopment occurs is explained by tracing the development of the sensory system and demonstrating its importance to the proper functioning of the total human organism.

The paper goes on to discuss the harmful effects of sensory deprivation, and the restrictive attitudes in school and society which cause this.

Finally, some practical suggestions are made for activities and projects that can be undertaken in art education to help reduce these harmful effects and allow greater potential growth in the individual.

CHAPTER 1

STUDIES IN THE DEVELOPMENT OF SENSORY SYSTEMS

MAN IN THREE DIMENSIONAL SPACE

To be able to operate in space the human organism must become aware of it. He must estimate space, measure, organize and live within it, efficiently or inefficiently, according to the degree of spacial awareness he is able to achieve. A child first learns to orient himself by experiencing the pull of gravity on his body, using the balancing mechanisms in his ears and developing his bimodal hearing and seeing. As he learns to stand erect and move about, his muscular and neural co-ordination give him, in addition, a feeling of security due to his stability and definite localization relative to his environment. The basic movement pattern out of which all other movement patterns must develop is that of posture. Posture is a positive neuro-muscular act in which a series of muscle groups are innervated in pattern so that the position of the body with reference to its center of gravity is maintained. The upright body consists of a head relative to a trunk, which is relative to a set of legs, all of which are relative to the ground.

> This system cofunctions with the vestibular orientation of the head relative to gravity so that contact with the ground and orientation to gravity make a super ordinate system. The posture of each and every body member is an elaboration of this system. The sensitivity of the joints to their angles is evidently of crucial importance for this system. In this way, an extremity can be oriented to both the frame of the body and the framework of space, even in the absence of vision. [1]

[1] J. J. Gibson, THE SENSES CONSIDERED AS PERCEPTUAL SYSTEMS, (Boston: Houghton Mifflin Co., 1966), P. 102.

Thus a child who grasps a ball can, by the combination of awareness of the disposition of members of his body and cutaneous touch, be aware of the shape of his grasping fingers as well as the feel of the shape of the object. This allows a gathering of information about solid objects in three dimensions.

At the same time that a child is developing postural awareness he is also developing his perceptual facilities. In man's first acts of perception: tactile, kinesthetic and visual experiences relate what is perceived. This experiencing of objects develops a visual-motor method of gathering perceptual knowledge of all concrete things. Dr. D. O. Hebb says that the process of perceptual learning must be thought of as establishing a control of association-area activity in the brain by sensory events.[1] The environmental stimulus is incorporated into the continual background activity of the central cortex resulting in a cumulative action that builds up assemblies of cells and constitues first learning. Hebb goes on to say that prompt learning is possible only when the stimulation sets off well organized phase sequences. The prompt learning of maturity is not an establishing of new connections but a selective reinforcement of connections already capable of functioning. The sudden activation of an effective link between two concepts or percepts at first unrelated can be called a restructuring of thought or a simple case of creative insight.[2]

Man's emotional and physical security requires a kind of perceptual-motor relationship to the form he sees. He uses his own body posture to which he relates the movement, position and size of the objec-

[1]D. O. Hebb, THE ORGANIZATION OF BEHAVIOUR, (New York: John Wiley & Sons, 1949), P. 123.

[2]Ibid, P. 134.

tive world and as a result, assigns "meaning" to these objects. Man physically reacts to objects, organizes himself for action and evaluates his environment. He handles objects and experiences, gauges weights or compares emotional feeling using himself as the standard. He continually and automatically tests himself against everything internal and external that he comes in contact with. It takes a certain time before man realizes that he is also an object in space. Being a psychobiological participant in space, affects his dynamics of perception. His self image is perhaps related to objects as a feeling of belonging in a total cosmos. He sees and feels and reacts in three dimensional space. He, himself, is a three dimensional object and therefore, can associate himself comfortably with what he sees and feels around him.

BODY IMAGE

A child seems to derive a great deal of pleasure from exploratory motor action and controls, probably by means of pleasurable feedback resulting from motor activity. In this manner he builds up lines of communication not only between himself and the object, but also within himself in reference to motor-perceptual knowledge of that object. This leads into the concept of body - image which man develops by aid of motor perception. Sir Henry Head states that:

> ... before the afferent processes caused by the movement of a joint can evoke a perception, they must be integrated and brought into relation with physiological dispositions, which are the result of antecedent changes in posture. Complete recognition of spacial relationships occurs with the appreciation of serial changes in certain directions . . . . By means of perpetual alterations in position we are always building up an unwilling model of ourselves which is constantly changing. Every new posture or movement is registered on this plastic schema and the activity of the cortex brings into relation with it each fresh group of afferent impulses evoked by a change in the position of the body. The physical act of postural recognition follows, as soon as this relation is

> completed, on levels that are not associated with consciousness." [1]

The child's body, being mobile, becomes the anchor or hub around or to which all other things become related. F. H. Allport, continuing this same line of investigation indicates that:

> "In starting to preform an action, though we do not consciously take account of the position and posture of the body member in relation to the object and to our body, such a position is automatically registered in the nervous system and brought into relation with the action. Though perceptual alteration in posture we are constantly building up a 'model of ourselves' which is changing continually as each new group of afferent impulses, evoked by further changes of position, arrive at the cortex."[2]

The hub or anchor is therefore the "model of ourselves" that develops in the child. This is an unconscious process during his early months, becoming more conscious as his awareness increases.

A child begins to incorporate objects into his responses early in life. Future experiences only acquire "meaning" if they evoke or awaken some parts of these earlier incorporations. A person does not understand the concept "cup" until he has, in some way, reacted with or to it. As he grows, these visual-motor experiences increase and develop finer discriminations. There can be no perception of objects "out there" without a body framework. Conversely, there can be no perception of the body as object without environmental frame of reference. Thus, one basic feature of this body-object relationship is the interaction constantly going on between them. Once awareness of an object has been established,

[1]Sir Henry Head, APHASIA AND KINDRED DISORDERS OF SPEECH, (Cambridge: University Press, 1926), P. 488.

[2]F. H. Allport, THEORIES OF PERCEPTION AND CONCEPT OF STRUCTURE, (New York: John Wiley & Sons, 1955), P. 709.

it is consciously forgotten and will become conscious only when some change occurs that is discovered by this body-object relationship. In many cases this will be of a nearly subliminal nature. T. Pasto states that, "Man adjusts to his surroundings by acts of visual perception in which organic spatial harmonies are felt, a spatial continuum which includes the spectator is set up. If this harmony, which becomes subliminal, is changed; then conscious effect must be exerted in order to assimulate the new visual data encountered."[1] It also seems that these visual-motor encounters are necessary for man's security, mental growth and meaningful expression. Pasto continues:

> ..."we find that the individual, a vertical moving object, possessing weight and thickness creates a spaceframe and projects it about him as the favorable stabilizing medium within which he moves and expresses himself. He is the dynamic and controlling center. He cannot carry out his biologically inherited task, the perpetuation of the specie, without this enhanced mental and physical security. The medium within which he moves, therefore, is his own creation. All work, all expression, all play are secondary to and often complementary to the desire for security and the resultant physical-mental health necessary for continued living."[2]

Thus it appears that humans need a relationship or comfortable union with objects as well as adequate human relations to remain functioning normally. Tactile stimulation during infancy probably serves to initiate body awareness and thus holds a major role in the achievement

[1]Tarmo Pasto, THE SPACE-FRAME EXPERIENCE IN ART, (New York: A. S. Barnes, 1964), P. 29.

[2]Ibid, P. 16.

of identity. The handling, rubbing, patting, sponging and stroking, etc., contribute in a variety of ways to the development of the child's self-ness and the world of "otherness". If the quantity of such stimulation is adequate, an abundant supply of data is available from which a program of body awareness and tactuality can develop. If the quantity of such stimulation is less than desirable, the reduction can be expected to take its toll upon the individual's self identification and diminish his appreciation of the textures of the world.

P. Schilder says there are three main categories in human existence: the world, the body, and the personality. The world is a loose structure which contains elements of various kinds, including the other two categories. Personality which exists in the body, which in turn exists in the world, interprets the world through the body or in connection with it.[1]

A person consciously and actively directs his attention towards the gathering of data concerning the world and his own body. This is a continuous process repeatedly tested, rejected, remade and retested by inner and outer forces. Through experience and its retention by memory, and by comparison and association with other experiences, man is able to develop his body-image and personality. However, body-image is based, not only on association, memory and experience, but also on intention, will, aims and circumstances. We always re-arrange actual experiences according to the needs of the total personality. This is done to a great extent by processes which remain in the background of consciousness. "But it is clear", Schilder states "that even the perception of the postural model

[1]P. Schilder, THE IMAGE AND APPEARANCE OF THE HUMAN BODY, New York: International Universities Press, 1950), P. 284.

of the body does not lead to a rigid and clear-cut entity. There is nothing definite about the perception, there is nothing static about it. There is a continual struggle to reach a static picture and to model something which is continually changing into a structure."[1]

Thus, our bodies, which we usually regard as well known, firm and relatively stable in form become a rather uncertain possession. Schilder also says that basing experience of life on knowledge of the body alone or on sensation alone is not sufficient. He says that sensations only get their final meaning in connection with a postural model of the body, that is, a body-image. The development of body-image in relation to others then is of crucial importance.

> "Our attitude towards the different parts of the body can be to a great extent determined by the interest other persons take in our body. We elaborate our body-image according to the experiences we acquire by the actions and attitudes of others. These may be words or actions directed towards our body. But the attitudes of others towards their own bodies will also have a great influence. Diseases which provoke particular actions towards our own body also change the postural model of the body. Early infantile experiences are of special importance in this connection but we never stop gathering experiences and exploring our own body."[2]

It is difficult to realize the extent of the individual's knowledge of his body, yet there is evidence that a disturbance of body imagery can be found in virtually every case of neurosis or psychosis.[3] Some studies have shown that early body anxiety appears to have the consequence of encouraging certain long term modes of behaviour. For example, boys

[1]P. Schilder, THE IMAGE AND APPEARANCE OF THE HUMAN BODY, New York: International Universities Press, 1950), P. 297.

[2]Ibid, P. 299.

[3]M. Lipman, WHAT HAPPENS IN ART, (New York: Appleton-Century Crofts, 1967), P. 71.

with high body anxiety (disturbed body-awareness) were found to avoid athletic activities and to invest an increasing proportion of their time in intellectual tasks.[1]

Since body imagery results from a highly ordered associational system of the brain, disruptions are on the same level as other types of symbolic function. In projective tests it was found that some mental patients symbolically transpose, reject, ignore or borrow from themselves or others, certain parts of their bodies.

If we close our eyes and remain motionless, our body-image begins to dissolve. Thus, body-image is a result of effort and cannot be completely maintained when effort stops. A body-image is always not quite a complete structure, but requires an unceasing data flow to maintain itself.

[1]S. Wapner and H. Werner, THE BODY PERCEPT, (New York: Random House, 1965), P. 49.

SPACE-FRAME

In the quote by Tarmo Pasto, reference was made to the establishment of a space-frame as a stabilizing medium. Pasto explains that a space-frame is created in the following manner. If there were no objects or forms existing, then there would be no space to perceive, for objects and forms delineate and describe space. Space then, is a three dimensional transparent substance which becomes known only through perception of the objects in it. The perceiving of these objects is first achieved in humans by means of visual-motor perception. This relates or causes an "experience" of that object in reference to the person's own body-image. Thus, all objects and the total space they exist in are perceived by motor-perception. The sum of these perceptions constitutes the space-frame reference man uses to comprehend his world.[1] Thus, space-frame is the set and standard with which an individual measures and evaluates his experience.

Jean Piaget says that the elaboration of the object is bound up with that of the universe as a whole. "The elaboration of the universe by sensorimotor intelligence constitutes the transition from a state in which objects are centered about a self which believes it directs them, although completely unaware of itself as subject, to a stable world conceived as independent of personal activity."[2]

According to Piaget, sensorimotor intelligence evolves in the following manner. Assimulation is essentially the utilization of the external environment by the subject to nourish his hereditary or acquired

[1]Tarmo Pasto, THE SPACE-FRAME EXPERIENCE IN ART, (New York: A. S. Barnes, 1964), P. 16

[2]Jean Piaget, THE CONSTRUCTION OF REALITY IN THE CHILD, New York: Basic Books, 1954), P. 351.

schemata. Schemata such as those of sucking, sight, prehension, etc., constantly need to be accomodated to things. At this stage the external world does not seem formed by permanent objects, neither space nor time is yet organized in groups and objective series and causality is not spatialized or located in things. The universe at first consists in mobile and plastic perceptual images centered about personal activity. Next, a coordination among schemata is developed and deduction is organized and applied to an experience conceived as external. Now the universe is built up into an aggregate of permanent objects connected by causal relations that are independent of the subject and are placed in objective space and time. The self thus becomes aware of itself at least in its practical action, and discovers itself as a cause among other causes and an object subject to the same laws as other objects.[1]

In summation, it is only by establishing himself in his own space and time that man is able to function normally in his environment. He needs to establish lines of communication to objects as well as to other men. This process is begun early in life when a child takes joy in physically moving objects which he can recognize and grasp. Piaget states that "this recognition does not, by itself and without further complication lead to object concept. In order that the recognized picture may become an object it must be dissociated from the action itself and put in a context of spatial and causal relations independent of the immediate activity."[2]

The child must therefore be able to search for vanished objects

[1]Jean Piaget, THE CONSTRUCTION OF REALITY IN THE CHILD, (New York: Basic Books, 1954), P. 351.

[2]Ibid, P. 6.

and have a belief in their permanence, thus forming the concept of object. He begins to develop control over objects by applying his total sensorimotor being to that object. That is, he begins to consciously direct orientation of himself and objects within the space-frame projection through awareness of his body-image.

KINESTHETICS AND P.T.O.

Kinesthesia, which plays an important part in the development of body-image, is the cognitive employment of position and patterned muscular effort to resolve tasks. Kinesthesia is the psyco-physiological method which enables the individual to process movement information and be directed by the information he processes through a system of feedback. In gaining kinesthetic experience a child will strive continuously to perform, mastering some motions and remaining clumsy in others. He will shove, push, pull, lift, kick and throw. His muscles learn bit by bit and day by day, when to tense and when to relax. He will come to identify when a movement "feels right" and when it does not.

> "A kinesthetic sophisticate is a constant perceiver of his own motion and thrives upon processing information through his muscular system. The kinesthetic fluency which a child achieves during the first two years probably sets his level of kinesthetic sophistication for life. If there is any slowing down or mislearning in the motor feedback system at that time, he is likely to remain kinesthetically naive into adulthood."[1]

Children manifesting kinesthetic immaturity may be expected to reveal a history of limitations in exploring their surroundings; whether this resulted from circumstances of illness or handicap, from lack of parental concern for movement exploration, from parental solicitousness for fear of injury, or any other cause.[2] Thus, a person's level of kinesthetic organization can serve as a lifelong asset or lifelong liability. One speculation is that children who are slow to learn motor skills and show difficulty in figuring out "what to move and how to move

[1]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle, Wash: Special Child Publications, 1967), P. 221.

[2]Ibid, P. 228.

it" express this kinesthetic inefficiency because one or more of the Postural Transport Orientations have not provided a sufficient foundation.[1] The Postural Transport Orientation (P.T.O.) is the label Barsch gives to the space-frame concept. Barsch's theory can be summed up in the following manner: Each learner must acquire sufficient muscular strength to support an erect pattern of movement in a gravitational field. Movement of muscles to support motion demands both static and dynamic balance. Strength and balance in patterns of motion give the mover body-awareness. Existence and movement in a tridimentional world requires spatial awareness. If movement is to be forceful, balanced, controlled and directed, some degree of temporal awareness will be necessary to synchronize such movements to the survival advantage of the individual. These five components are necessary for building a suitable posture and efficient transport and therefore are called Postural Transport Orientation.[2]

[1]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle, Wash: Special Child Publications, 1967), P. 228.

[2]Ibid, P. 78.

UNITY OF SYSTEMS

As can be seen in the development of the P.T.O. system, complete interaction and integration is required for efficient operation. It now becomes apparent that unity and interdependence of human systems are essential if the person is to develop higher cognitive and visual systems.

POSTURAL UNITY: The human skeleton contains over 100 mobile joints but their total input of information is not a sum or statistical collection. The orchestration of this input to the central nervous system is not a collection of sensations but a structured perception. The angle of one joint is meaningless if it is not related to the angles of all the joints above it in the postural hierarchy. The grasping of a ball is not the distinct sensations of all the joints of the fingers, the spatial relationships the fingers describe and the cutaneous sensations of the skin, but a combination of all these which is a perception of ball. We do not get three different perceptions from the three systems but a perception of only one object.

Studies by Lowan and Mills fifty years ago demonstrated improvements in visual efficiencies through orthopedic treatment. The improvement or reduction of various forms of visual distortion by means of special exercises or activities aimed at achieving efficient skeletal alignment and optimun response to gravitational pull shows the intimate interdependence of these faculties.[1]

Dr. M. Feldenkais views the unity of mind and body as an objective reality. To him they are not entities related to each other in one

[1]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, Seattle: Special Child Publications, 1967, P. 267.

fashion or another, but an inseparable whole. Following this idea he believes it is necessary to re-align the parts of a person's body in the cure of various complaints. He does not deal directly with the affected member or articulation but works on an improvement in the breathing and neck-head relationship. His procedure is a successive series of postural and body member relationship altercations, each one allowing a further improvement in the segment just dealt with. He endeavors to rearrange the skeletal muscles so as to create a healthy powerful, easy and pleasurable exertion. He strives for a realignment that is a unity of skeleton, muscles and environment of which a person has simultaneous awareness.[1]

BODY EXTENSIONS: Man also forms a kind of unity with the tools he uses. He can employ his fingernail as a tool but awareness of touching is at the end of the nail, not at the root where the sensation should theoretically be felt. Similarly with a stick, man "feels" touch at the end of the stick, not in his hand. Thus man can make efficient use of tools such as clubs, rakes, screwdrivers, pencils, and tennis rackets which all become extensions of himself. This is because the mechanical disturbance at the end of the stick is obtained by the hand as a perceptual organ including information about the length and direction of the tool. This is really an example of higher order perceptual functioning which relies on the unity and interaction of all basic sense modalities and perceptual systems.

SPACE AND BODY PERCEPTION: Tests carried out by Wapner and Werner show that when a subject is placed in an open, extended spatial context

[1]M. Feldenkais,"MIND AND BODY", SYSTEMATICS, VOL. 2, No. 1, (June 1964), P. 53.

as opposed to a closed confined one, there are changes in the experience of expansiveness. This has effects on body perception in terms of shrinkage and expansion. In one test, subjects continually indicated a narrower width measure of their own heads when tested in a confining room with closed walls.[1] These findings support the view that perception of body space and perception of external space are not independent but rather interact intimately. In other tests carried out by Wapner and Werner, it was demonstrated that any change in relation between subject and environment bears significantly on the way in which the body and the parts are experienced.[2]

EMPATHY: Another area where the interaction of the basic perceptual systems becomes apparent is in the phenomenon of empathy. Empathy is a word used to describe the reactions a viewer has when he projects his own personality into an object, a person, an event or experience. As he perceives something, the viewer is also unconsciously engaged in summoning up the feelings and ideas which have been previously experienced in association with neuromuscular sensations similar to those now taking place as he perceives something. He sees and thinks with his own physiological equipment, particularly with his own muscular, skeletal, neural, circulatory, glandular and cutaneous systems. These reactions can proceed both ways. "An extensive list of examples could be drawn where visual stimulation serves to call forth gustatory, olfactory, tactual, kinesthetic and auditory responses as well as where stimulation of any of the

[1] S. Wapner and H. Werner, THE BODY PERCEPT, (New York: Random House, 1965), P. 19.

[2] Ibid, P. 23.

other five modes serve to call forth a visualization."[1]

In viewing an abstract painting, the colors, shapes, lines, structure, etc., open or close neural pathways which were previously affected in a similar manner by similar patterns of motor activity. When we experience a common object such as a circle, already confronted thousands of times before, we automatically relate and fuse these earlier "meanings" of circularity with the present experience of it. The content and the cues provided by a work of art help the organism select from many previous encounters those feelings, "meanings" or neural connections which are most appropriate, that is, most related to the character, of the present stimulus. Because the viewer is not consciously aware of these processes taking place within him as he looks at a work of art, he attributes the reactions he experences to the objective form he sees. His response or inner mimicry is a creative one to the visual material before him. He experiences a subliminal awareness of feelings which are consciously experienced as qualities, not of his own constitution, but of the work of art itself. Thus, it can be seen that empathy plays a large part in motor-perception and the assigning of "meaning" to visual stimulus. Many art forms use this phenomenon as a major vehicle of expression.

VISUAL UNITY: The visual system, whose evolution was essential to survival, can be called the most highly developed of the sense modalities. It assumes the major role in the higher cognitive function of perception or visualization.

Vision is a dynamic, persistent on-going behaviour in a light sensitive organism.[1] The use or need of vision includes seeking

[1]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle, Wash., Special Child Publications, 1967), P. 284.

[2]Ibid, P. 267.

information, directing movement, localizing space, identifying, significance, and unifying data from other sources. It can also record data that may be recalled in future time.

The interaction of vision with the rest of the sensory systems, and the organism as a whole, develops in the following manner. A light gradient on the retina triggers the body to come to a point of balance with both light and gravity in preparation to act.[1] The neck, head, and body establish the frame of reference through the mechanism of postural unity, space and body perception. This frame of reference, the visual space, sets up the co-ordinates in which the organism can centre itself in relation to its environment. Thus, when a child physically explores space, he is at the same time employing spatial perception. The visual impression becomes meaningful from the associations of his visual impressions with his physical movements. The distance to an object cannot be accurately estimated by vision alone until experience in reaching to touch or crawl to the object takes place. In the same way, an object cannot be identified visually as having a particular smell until it is seen and smelled simultaneously. A particular sound only becomes a clearly established bit of knowledge after it is localized and its source visually identified. All of these experiences depend on a prior or concurrent development of the basic sense modalities of touch, smell, hearing, etc. After experiences are acquired in which vision interacts with other sense modalities, it is possible to reverse the procedure. Sound can trigger pictures in the mind. Touch can also stimulate mental pictures as can smell or taste. Reading or watching a movie can cause

[1]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle, Wash., Special Child Publications, 1967), P. 257.

kinesthetic empathy to the point of muscular fatigue. A picture of food can conjure smell, taste, texture, and so on. The visual sense is completely integrated with, and interdependent upon, the other sense modalities. This visual unity is essential to the proper functioning of an individual.

> "All modes are probably visual in final analysis. The efficiency of any single mode or combination of modes in the performing individual will depend upon the complexity of the development of visualization. It is the most economic, most flexible, most expansive and swiftest mode for processing information. All other modes contribute to its development and it, in turn, enriches and expands the functional efficiency of all others."[1]

The visual system then becomes the mechanism which converts all other modal information into a common denominator - visualization, or perception. Visualization becomes the agent for synthesizing, revising, retrieving, computing, evaluating, and designing. In earlier developmental stages objects had to be physically present to be touched, tasted, smelled, felt, heard, or seen. The organism eventually arrives at a point where mental representations of all sensory experiences can be conjured up for the individual by a sequence of graphic symbols on a two-dimensional surface. In order for vision to fully develop, it is necessary that all the other sense modalities also be fully developed. Thus visualization is a higher cognitive function based on an adequately developed visual system. The visual system in turn is developed from, and in conjunction with, the other adequately developed basic sense modalities.

MOVIGENICS: Barsch outlines a theory called movigenics which deals with the relationship of movement and learning. It is a study of the

[1]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle, Wash., Special Child Publications, 1967), P. 278.

origin and development of patterns of movement in man and the relationship of these movements to his learning efficiency. Barsch views movement efficiency as the fundamental principle underlying the design of the human organism with the economic promotion of survival as its basic objective.[1]

In his physiologic construction, man is quipped with a wide variety of protective devices - emerging, reacting forces which defend against annihilation. Movement efficiency is derived from the information the organism is able to process from an energy filled environment. The raw data from the energy-environment must be translated into meaning, to inform the organism of its own position, reaction, method of coping and action to be taken. Barsch calls the human mechanism for transducing energy forms into information, the percepto-cognitive system.[2]

In converting the energy forms into information the organism uses the five senses which are more appropriately designated as systems of sensibility (sense modalities). These sensitivity systems and their interdependence and interaction are viewed as a prologue or introduction to perception and the process of cognition.

LANGUAGE: Movement efficiency is symbolically communicated through the visual-spatial phenomenon called language.[3] A symbol is a form used by man to "stand for" or to represent an experience, event, circumstance, happening, etc. As long as the child's world is limited to oneness and each object has singularity and can be directly touched, tasted, heard, seen, smelled and moved, there is no real need for symbols. Only as his

[1]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle, Wash., Special Child Publications, 1967), P. 35.

[2]Ibid, P. 42.

[3]Ibid, P. 59.

world expands does he require the use of symbols and the more complex the world becomes, the more reliance he puts on symbols to organize that complexity with some degree of economy. The human organism at first gathers information through sensory exploration but progressively switches to the cognitive level. Symbolic fluency thus becomes the ultimate criterion of movement efficiency and relies on movement for its development.[1]

[1]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle, Wash., Special Child Publication, 1967), P. 63.

CONCLUSION

It can be said that our employment of language and other symbolic systems, our highly developed visual system and the multiplicity of behaviors, endeavors, achievements, etc. are all based on an efficient space-frame or P.T.O. operation. These in turn are all dependent on an integration and smooth co-functioning of all the well developed sense modalities. It is therefore undesirable to try to educate by separating the senses. The result will most likely be an unbalanced foundation for later learning of higher cognitive and symbolic systems. This is exactly what school systems seem to be doing at the present time, and this can be especially damaging to younger children, for as Piaget points out, some of these basic perceptual systems are not fully developed until approximately 9 - 10 years of age.[1]

This chapter described the development and unity of the sensory systems in relation to environment. The next chapter will investigate the sequential stages in the development of intelligent activities which are based on the maturity and interaction of these sensory systems.

[1]Jean Piaget and Barbel Inhelder, THE CHILD'S CONCEPTION OF SPACE, (New York: Humanities Press, 1956), P. 417.

CHAPTER 11

THE DEVELOPMENT OF INTELLIGENT ACTIVITIES

In The Origin of Intelligence in the Child by Jean Piaget, intelligence is defined as the relationship between the human organism and "things". The human organism reacts to its physical environment by processes of assimilation of external things, along with a mental organization of these things assimilated. The child first gropes about in an effort to assimilate and make some sort of order from its experiences. Soon he discovers certain relationships, then forms habits until behavior becomes continuous and consistent, and constitutes an "intention". This "intention", Piaget says, is the essential characteristic of intelligence. An act is intentional when it is enacted with conscious aims and objectives as opposed to an act determined by external stimulus alone. Intentional adaption begins when a child, not only engages in the simple stimulus evoking activities of listening, looking, sucking, grasping and so on but also, "acts upon things and uses the inter-relationship of objects, in other words, intelligence develops . . . in contact with things and increases its range and capacity in so far as the images derived from this basic sensuous experience are formed and reformed in imaginative activity, (imaginative activity means invention through mental combination)."[1]

It is through this faculty of assimilating sensuous impressions from material things (motor-perception) and then combining them in significant relationships, that man expresses, utilizes, or exercises his

[1] H. Read, THE ORIGINS OF FORM IN ART, (New York: Horizon Press, 1965), P. 153.

capacity for intelligent activities.

In the development of intelligent activities, the child passes through certain crucial developmental phases which have great bearing on the philosophy of education and Art Education in particular. Young children are unable to visualize the results of even the simplest action until they have seen them performed. This is because thought can only replace action on the basis of the data which action itself provides. "Spatial concepts can only effectively become operant as internalized actions if they become active themselves, by operating on physical objects, and not simply by evoking memory images of them."[1]

Children are able to recognize and represent only those shapes which they can actually reconstruct through their own actions. Hence, the "abstraction" of shape is achieved on the basis of co-ordination of the child's actions and not, or at least not entirely, from direct observation of the object. The abstraction is thus based originally upon sensori-motor and ultimately on mental representational space, determined by the coordination of these actions.[2] Piaget further says that the child does not try to see the whole of a familiar object upon sight of part of it until prehension has been acquired. Thus, it is solely the habit of grasping and manipulating objects, endowing them with a relatively constant form, and locating them in a space that has greater or less depth, that permits the child to form a concept of their totality.[3]

Up to the age of about $2\frac{1}{2}$ the child relates objects to himself as the center of space, and he comprehends little of the relationship

[1]J. Piaget and B. Inhelder, THE CHILD'S CONCEPTION OF SPACE, (New York: Humanities Press, 1956), P. 454.

[2]J. Piaget, THE CONSTRUCTION OF REALITY IN THE CHILD, (New York: Basic Books, 1954), P. 77

[3]Ibid, P. 27.

between objects. Between 3 and 4 years he moves in "empirical" space. He transfers patterns, tries new ways and experiments, but still remains the center of his spatial universe orienting objects directly to himself. About age 4 he begins to move in "objective" space. He adapts his patterns to the objects instead of trying to adapt the objects to his patterns and begins to realize he is one object among other objects.[1]

> "The person has the power to construct a system of relations to understand the series of surrounding events and to understand himself in relation to them. To organize such a series is to form simultaneously a spatio-temporal network and a system consisting of substances and of relations of cause to effect. Hence the construction of the object is inseparable from that of space, of time, and of causality."[2]

The co-ordination of the perceptual field reaches its maximum efficiency about age 9, the same age at which the concepts of vertical and horizontal finally emerge as potential co-ordinate axes. Nine is also the approximate age which lies midway through the period in which concrete operations first take shape. These operations mark a decisive turning point in the development of spatial concepts which supply the framework appropriate for comprehension of Euclidean and projective systems. The other great comprehensive system - that of time, co-ordinating movements and speeds - is also completed at the same age.[3]

The child first develops and extends his basic sense modalities by engaging in simple stimulus evoking activities giving him simple information about the objects of his world. These sense modalities begin to interact and support each others information gathering ability. This

[1] J. Piaget, THE CONSTRUCTION OF REALITY IN THE CHILD, (New York: Basic Books, 1954), P. 44.

[2] Ibid, P. 92.

[3] Ibid, P. 417.

creates a network or unity of systems which allows much more sophisticated exploration. Out of this unity comes the ability of the child to engage in higher order functions. This is what Piaget means when he says that intelligence (higher order functioning) is defined as the relationship between the human organism and "things".

The main point of Piaget's findings is that the child cannot be expected to acquire certain facts about the world until he is ready to perceive them. The ability to attend to the higher order features of objects and events develops in graded stages. He is not simply an adult without experience or a conscious body without memory. The ability to select and abstract information about the world grows as he does.

This chapter indicates that the child interacts with his environment in developing intelligent activities. The following chapter shows how essential this interaction is by studying the effects of reducing environmental stimulation on man and animals.

CHAPTER III

SENSORY DEPRIVATION

LEAST EXPENDITURE OF ENERGY ATTITUDE

In the field of physics, a law has been formulated called Kirchoff's law. It is closely related to the Gestalt theory when applied to perception. "Kirchoff's law would assert that the current intensities in a system of circuits (the perceptual forces within the organism) will be distributed in a pattern which produces or uses a minimum of energy while functioning as a system. This amounts to asserting . . . that the organism tends to seek the route of maximum simplicity (the least expenditure of energy) to achieve closure."[1]

Perception then, takes place according to the most economical expenditures of energies. This "law", of course, holds for most other human functions, conscious or unconscious. Body organs, unless functioning in an abnormal manner, supply just enough secretions to carry out their functions. However, there is a very dangerous and critical point involved here that affects the human organism but not the electronics field from which Kirchoff's law came.

As these circuits, which require minimal energies, develop in perception, the same set of neural networks tend to be used each time for that particular perception. Soon permanent connections (synapse) are formed in the brain and the same or similar stimulus will usually be perceived in the same manner. It has now become a learned pattern

[1]E. B. Feldman, ART AS IMAGE AND IDEA, (New Jersey: Prentice Hall, 1967, P. 294).

of response and is quite permanent. If a similar situation is encountered that cannot be solved in that same way, other neural pathways and connections must be employed. The organism, not knowing how to solve it, becomes agitated. The brain becomes a beehive of activity and involves the whole body in searching for a solution to the problem. Thousands of processes must be tried, evaluated, accepted or rejected in micro-seconds. These processes are followed by succeeding processes built on the successful or acceptable solving of the first. If these processes, networks, and storage and feedback systems are not often used, the person becomes much more agitated and uncomfortable. He doesn't have the confidence, know-how, experience, and insight to help him solve the problem. He is lacking an adequately formed series of alternate behaviors or flexibility with which to solve his problem.

This agitation is uncomfortable and therefore most organisms try to avoid it. This is what can happen to a child if school is dull, if his surroundings are uninteresting or in general, if he lives in a non-stimulating, non-motor-perception evoking environment. He will adapt a "least expenditure of energy" attitude which will permanently and negatively affect his development and learning abilities.

J. S. Bruner calls this "sensory deprivation". "In conclusion, then I have suggested that any sensory deprivation prevents the formation of adequate models and strategies for dealing with the environment and that later sensory deprivation in adults disrupts the vital evaluation process by which one constantly monitors and corrects the models and strategies one has learned to employ in dealing with the environment".[1]

[1]J. S. Bruner, SENSORY DEPRIVATION; A SYMPOSIUM, P. Solomon, Ed., (Cambridge: University Press, 1961), P. 207.

This means that a person suffering from sensory deprivation has not constructed an adequate space-frame or body-image with which to deal with his environment. The nervous system in part functions as a programmer for the computer - the body. But this programming function will not develop fully if a rich, variable, stimulating environment is not encountered. In fact, Bruner finds that sensory deprivation causes slowness, confusion and high occurance of error in experimental tests. The ability to solve indirect problems is lessened, the ability to discriminate is reduced, and behavior in general becomes more conservative - less exploratory with less insight into cause-effect relations.[1]

[1]J. S. Bruner, SENSORY DEPRIVATION: A SYMPOSIUM, P. Solomon, Ed., (Cambridge: University Press, 1961), P. 205.

SENSORY DEPRIVATION STUDIES

Psychologist Rene Spitz has carried out studies on children reared in foundling homes under very sterile psychological conditions. He observed that, during early infancy, these children were kept in white cribs with only a white ceiling to look at. Nurses came around several times a day to feed them but it was a perfunctory act and there was virtually no handling or fondling. Spitz found extreme retardation in these children, both physically and intellectually. Many of them couldn't sit up at one year, were slow to walk and even slower to talk compared to children raised in normal homes.[1]

S. M. Jourard has explained this by proposing that body contact may have the function of confirming one's bodily being. If this function is disrupted, various retardations may occur in the child's developmental behaviour which in turn will have serious effects on his adult life. The lack of body contact in the infant's life is likely to cause a person to avoid the physical contact essential for a rich and full adult life. Thus, body contact appears to have important implications for well being in general, not to mention its role in maternal care and in the sexual aspects of love. Jourard has further proposed that only those persons who have a relationship with others that includes touching and caresses will have a fully experienced body and a fully embodied self.[2] Touching another person is the last stage in reducing distance between people.

[1]Wouter De Wet, "CHILD'S INTELLIGENCE LINKED WITH HIS EARLY ENVIRONMENT", Montreal Star, October 1969, P. 21.

[2]S. M. Jourard, DISCLOSING MAN TO HIMSELF, (New Jersey: D. Van Nostrand Co., 1968), P. 149.

Kessen and Mandler have stated that physical contact between a mother and her child is a specific inhibitor of the unlearned, periodic "fundamental distress" to which children are subject, and which is the ANLAGE of anxiety in the adult.[1]

Experimental data suggests that body contact is the language of love among animals. For example, Harlow's monkeys ran to surrogate mothers of terry cloth presumably for the comfort they derived from contact when they were frightened or distressed.[2] The young of most animals rely on close contact with the mother during their early years. Humans require the longest periods of contact both physically and spiritually. Body contact has a very pronounced developmental function and deprived of this contact, man experience retardation and non-development as the Spitz and Jourard studies show.

Just as body contact is essential for the well being of an infant, so a patternable environment is critical to his visual development. It is necessary for visual space computing. Without a patterned visual environment in early infancy, eye movements remain infantile and visual space computing becomes extremely difficult. As shown in visual deprivation studies, newborn kittens reared in the dark for 2 weeks past the normal eye opening period took about a week to recover to their normal development.[3] Chimpanzees with restricted visual patterns were gravely deficient in visual co-ordination. Although their eyes were sensitive to light, their visually-guided locomotion, object manipulation, reaction to moving objects and pattern vision were greatly impaired requiring hundreds of hours to recover.[4]

[1]S. M. Jourard, DISCLOSING MAN TO HIMSELF, (New Jersey: D. Van Nostrand Co., 1968, P. 149.

[2]Ibid, P. 149.

[3]K. V. Smith and W. M. Smith, PERCEPTION AND MOTION, (Philadelphia: W. B. Saunders Co., 1962), P. 27.

[4]Ibid, P. 27.

SENSORY DEPRIVATION AND THE INTERRELATION OF THE SENSE MODALITIES

Similar examples of deprivation of the sense modalities such as vision are common. However, it is more important to examine how deprivation of some sense modalities affects the others and vice-versa. Studies in displaced vision have produced striking behavioral and organic disturbances in subjects. These effects range from minor emotional disturbances and frustration through dizziness, faintness, and giddiness to nausea and illness. Organized behavior is disrupted and at times, human subjects become almost immobile for long periods.[1] "Because of the close relationship of bodily actions and meaningful vision - both in the higher integrated functions of perceptions and in the lower processes of feedback between eyes, trunk, neck and labyrinth - adverse stress in any segment of this complex produces adverse functioning throughout the complex."[2]

These and other experiments in sensory deprivation support the view that the higher cognitive functions are interwoven with and based on a foundation of adequately developed sense modalities.

More evidence of this comes from other sensory deprivation studies. The disruption of thought processes in subjects caused extensive day dreaming, recall and recognition become impaired, difficulty was experienced in performing new perceptual-motor tasks. Some found it difficult to count and to talk. Many subjects had feelings of depersonalization and experienced a breakdown in body image. Hallucinations were frequent,

[1]K. V. Smith and W. M. Smith, PERCEPTION AND MOTION, (Philadelphia: W. B. Saunders Co., 1962), P. 108.

[2]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle: Special Child Publications, 1967), P. 276.

often involving elements from the auditory, kinesthetic and somesthetic senses. Some of the changes in body image appeared as arms being dissociated from the body and the body appearing smaller or floating in the air. Many subjects experienced auditory imagery such as music, buzz saws, chirping birds and voices.[1]

The results of experimental tests show that visual deprivation alone can produce an increase in tactual acuity, pain sensitivity, auditory discrimination and olfactory and gustatory sensitivity.[2] This further supports the close interaction view of the sense modalities and the theory that an ocular defect is replicated throughout the organism. Conversely, it is likely that any impairment to sensory functioning in the foundation sensory systems will eventually be negatively manifest in the visual system.[3]

[1]J. G. Corso, THE EXPERIMENTAL PSYCHOLOGY OF SENSORY BEHAVIOUR, (New York: Rinehart and Winston, 1967), P. 577.

[2]J. P. Zubeck, SENSORY DEPRIVATION, (New York: Meredith Corp., 1969), P. 252.

[3]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle: Special Child Publications, 1967), P. 283.

CONCLUSION

It is postulated that the process of seeking order where there is no order and attempting to incorporate non-order into previously existing schemata accounts for the perceptual changes, instabilities and inconsistencies described in the sensory deprivation studies. It may also be that the psychological aberrations occured not so much as a result of sensory deprivation per se but as a consequence of isolation from meaningful contact with the environment.[1] When the environmental conditions are so manipulated that the stimuli are restricted, depatterned or redundant, the stimuli lose their meaningfulness for the subject. The relevance of the stimulation cannot be established in terms of the subject's immediate psychological needs. It may be this restriction of meaning and not the specific physical limitation of the stimuli per se that produces the effects of sensory deprivation.[2]

Whatever the actual cause of the sensory deprivation effects, it remains that normal functioning of perceptual and cognitive activities depend upon heterogeneity of stimulus and a shifting environment at all times. This is especially crucial during the early stages of development of the sense modalities and their integration into a unity of sensory systems. The results of these studies have far reaching implications for our educational systems.

The investigation and discussion in the proceeding three chapters has been mainly on a theoretical and experimental level. In the next two chapters, the everyday, practical implications will be the focus of attention. The discussion will include how the separation of the senses,

[1] J. G. Corso, THE EXPERIMENTAL PSYCHOLOGY OF SENSORY BEHAVIOUR, (New York; Rinehart and Winston, 1967), P. 578.

[2] Ibid, P. 586.

changed living patterns, society and the education system all make full development of the child's powers difficult. The last chapter will then show how Art Education might help reduce some of the harmful effects these obstacles can cause.

CHAPTER IV

PROBLEMS OF LEARNING AND DEVELOPMENT IN CONTEMPORARY SCHOOL AND SOCIETY

SEPARATION OF THE SENSES

Before the advent of speech, the world of primitive man was an undivided whole in which he operated by means of the integration of his sensory systems. In order to ensure his survival, man, as all other creatures, had developed a multi-sensory awareness of himself and his environment. This naturally evolved integration of the senses, acted as a combination of perceptual systems. Thus what the eye saw was supported by touch, smell and so on. This integration lasted more or less intact for thousands of years. But as man began to dwell on the glory of the intellect and vision, and neglect the emotional and other senses, this integration was broken up. Each sense became viewed as a single system which operated in its own narrow area. Art became only for the eyes and music only for the ears as each of the Arts became locked into their own speciality. The Church viewed the body and its systems as the basest part of man if not outright evil. The various sciences that began to dissect the human body in order to study its systems did so by separating each of the sense systems and treating them as independent units. Other sciences became specialized, narrowed and distinct from one another. The pervading view was that all things had to be separated and categorized for study and understanding.

EFFECTS OF CHANGING LIVING PATTERNS

In the present technological era, man as a species is experiencing a major shift in developmental experiences. Civilization in our space age has changed the terrain of survival from the horizon to the printed page, the column of figures, the telephone and the speedometer. A large portion of our society lives in slums, crowded apartment houses, streets with no parks and so on. We incapacitate our children with a school system that assumes everyone is ready for higher order cognative functions at age 6. We in the twentieth century are exposed to more than we are able to respond to or act upon. It is becoming more difficult for a person to fully utilize motor-perception to form an adequate space-frame reference with which to understand himself and his world. Inside the school the stimulus is often uninteresting and outside school it is often of such a terrific rate of bombardment that it cannot be effectively assimulated. Marshall McLuhan claims "most children seem to realize that going to school is a necessary interruption of their education",[1] when the content given them in school is much less stimulating than what is available outside.

This leads to a type of alienation between the child and his experiences which becomes an acute problem in the adult. Lasting and real "meanings" are harder to assign to the objects and humans that make up a person's experience. This may be one of the reasons why violence, crimes and wars are tolerated. They really have no "meaning" to the person who only sees things in a visually intellectual manner, that is, without adequate motor-perception-sensory experiences that ensure the

[1]Marshall McLuhan, FILM, THE MEDIUM IS THE MASSAGE, McGraw-Hill, 1967.

necessary foundation for higher order functions. The person who sees only in this visual intellectual manner views most action without any accompanying feelings of empathy or emotion. Without sufficient prior experiences with objects, people, situations, decision making and the like, a person has no reference to rely on when confronted with a new experience. The child in school, when forced to memorize, act out or passively resist the required experiences and materials before he is ready for them, is acquiring only superficial knowledge which is not based on his own experiences and understanding. Thus, when he sees something new, he often views it in the same manner he does school work - in a detached, uninterested, uninvolved or superficial way. What is worse, when he does see something new that he really wants to deeply explore, he cannot, for he hasn't developed a method by which he can fully experience his environment.

The child who forms only a visual intellectual awareness due to the lack of meaningful stimulation and experiences, is an organism which can no longer trust its senses. These senses, developed over thousands of years of evolution for specific environmental conditions are thus becoming obsolete. In part this is due to neglect and new circumstances but mostly because society and the educational system discourage their use. In school, the senses and basic perceptual systems are broken up, separated and denied the time and conditions needed for full development. Most present educational philosophy seems to have little regard for Piaget's stages of sequential development and assumes every child has adequately developed the motor-sensory foundation needed for the higher cognitive processes. But this does not appear to be the case. More and more pre-school and school age children are being denied the opportunities of

forming this foundation due to a restricting environment and changed living patterns. These are the children who develop various learning problems, behaviour problems, and other debilitating symptoms which are often termed learning disabilities.

Our school system, almost totally ignoring the re-integration movement of society still operates on the principle of division; mind above and separate from body and time-block, lock-step methods of imparting children with "usefull knowledge". The work of Dewey and others has not been followed up, developed and extended into the present situation. Only a few scattered, ill equipped and poorly supported attempts to better education have been tried. The educational system has insufficiently reacted to the changes in society, to the impact of the electronic age and the rising voices of the students themselves. It is perhaps a very healthy sign that students are resisting this type of education. They know the outside world offers more stimulation, is more up to date and in general is a better educator. That is one of the reasons large numbers of student-run experimental schools are springing up. Many of these schools attempt to integrate the student communally with his present environment, other students and teachers and his own being. At the basis of this way be the need for the further re-integration of the senses and the acceptance of this principle by the educational system.

PRE-SCHOOL

The human organism is called upon to perform complex behavioral patterns in an exceedingly complex environment. Constantly changing and seldom predictable, this environment forces the human organism to adapt by having a series of activities ready to meet various demands. The organism is thus required to be extremely flexible in behavior reflecting a process of either differentiation or generalization depending on the immediate situation. Such a flexibility or series of alternate behaviors and the possibilities of rapid and extensive selecticity can be ensured through the process of development and learning. Over thousands of years, man has evolved this method of dealing with his environment. It was a pre-requisite for his survival. He now endeavors to pass on to his offspring the learning and development required through various selected experiences tempered by the particular milieu he inhabits. However, in the area of teaching selected experiences, man has enccuntered some serious problems in recent years.

Our modern civilization demands more of the child than ever before, and its demands are increasing daily. However, the very civilization which is increasing its demands is decreasing the opportunities it offers the child for essential experimentation with basic skills. This decrease is due partly to an institutionalized policy, as in current education philosophy, and partly to circumstance which places the human organism in an environment very foreign from the one in which he evolved his learning and developing methods. Today, we find that many of the everyday objects surrounding the child are so complicated that experimentation with them becomes impossible. The most common household applicances can be damaged easily, requiring an expert to reassemble or fix them. Too,

there is considerable danger in letting the child's curiosity turn to his natural surroundings, such as electrical outlets, irons, T.V., etc. Even if he were allowed to experiment with modern gadgetry, he could never, in any case, understand how they operated and would not gain insight into basic mechanics.

It is easy to cite other examples of restrictions on the child's behavior. He is not allowed to run in an apartment building or the streets where he can discover how fast he and other things move. He cannot use his voice with its vast possibilities of sounds in a society that allows machines to roar but requires a child to be good and quiet, and so on. Modern technology has increased the demands for adaptive behavior but at the same time no similar increase is offered the child for basic, concrete experimentation on which such adaptive behavior must be based. Parents, instead of attempting to provide this increase, further limit the child's opportunities for learning and development by imposing their own culturally and socially inherited restrictions.

Charlotte Selver regards childhood as the beginning of a sort of self-imprisonment. It is the parents, she says, who invade every aspect of development and prevent the child from growing naturally. The child is taught to place a structure of misleading values on all he experiences. He is taught when and how much is good for him to eat, when and how long he ought to sleep, what parts of him are bad and dirty. When he falls and cries, he is taught not to allow the pain and shock to go their way but to seek instant distraction from them and expect fuss and anxiety from the parents, rather then quiet sympathy. He is taught that exposure to cool and getting wet in the rain are unpleasant and dangerous, and they will become so after the lesson is learned. The child is forced into

growing up unable to experience naturally as most other organisms do, thus confusing his capacity for judgment.[1]

Mrs. Selver states that parents convey the notion that exaggeration is needed for everything. They sniff fiercely at flowers, smack their lips for food, talk baby talk and so on until the child gets the impression that the natural way of doing things is somehow insufficient. Parents tend to coax children toward some effort even when none is needed in seeing, listening, speaking, walking, learning, etc. The child begins to believe that effort is needed for everything and grows up accepting that nothing happens without trying and trying hard. Parents tend to interrupt children from what they may be engaged in stressing that a "good" child comes when called, no matter what. This can help confuse a child's innate sense of rhythm.[2]

Soon the child learns that the evidence of his own senses cannot be trusted and he tends to judge at second hand and in generalities.[3] What comes to replace the real world of perception - the living content - is a world of ideas and images created consciously or unconsciously, not by the child's own discoveries but by our own history and culture.[4] Thus, through parental invasion, the child is boxed into the social mold and social norm and into himself. Instead of perceiving and discovering the world and himself in it, he comes to be ruled by ideas and conventions. He does not know how to allow himself to see, hear, and feel without interfering with his perception.

[1]Charlotte Selver, "REPORT ON WORK IN SENSORY AWARENESS AND TOTAL FUNCTIONING", EXPLORATIONS IN HUMAN POTENTIALITIES, Ed. by H. A. Otto, (Springfield Ill.: Charles C. Thomas, 1966), P. 490.

[2]Ibid, P. 491.

[3]Ibid, P. 490.

[4]Ibid, P. 492.

In man's present environment, the influences on the developmental patterns of the five senses have changed radically. If we look at the sense of touch as one example, we find how important yet neglected this sense modality is in the Western world. When a baby is born he is made aware of acceptance and affection through the sense of touch. Soon afterwards, however, he is warned against using his hands to feel things that are dangerous, dirty or forbidden. Throughout childhood and into adolescence he is told to keep his hands to himself and off the opposite sex. His parents tell him not to touch, his church tells him not to touch, and society tells him not to touch. Yet it is through the sense of touch - integrated with other senses - that the child discovers so much about his environment. Words like soft, hard, sharp, rough and so on would never have true meaning without the sense of touch. What it means to be kind and gentle would have a distorted value without touch. The use and making of tools, the awareness of the potential danger in pointed objects, the orientation to ground and chair would all be seriously deficient without touch. Sculpture, which evolved as a direct outcome of the sense of touch would never have attained the same strength and possibly would not exist at all. Still, when we go to a museum to view a sculpture show, we are confronted with signs that say "Do not touch". In society the same signs are invisibly in force as any child or youth discovers.

The child soon learns that the use of touch to convey or strengthen communication is severely restricted in our society. At the same time he finds that working with his hands is a slower activity, out of place in a society that dwells on speed. He also learns that manual labour is of lower social worth than working with the mind. He thus grows up, as

we all do, neglecting the sense of touch, which later deprives him of the opportunity to touch others - both emotionally and physically.

SCHOOL - AGE

Most children suffer from the pressures of society, touch being only one example of the manner in which various restrictions are imposed on sensory development. These pressures with their detrimental results are carried on in the school room. The child's already decreased opportunities for development and learning are further impaired by the present school system.

It has been shown that normal children two and one-half years old can learn to read and write through play.[1] However we insist that all children are "not ready" for the task of learning to read and write until they are six years old. Children themselves begin to believe this assumption because everyone says it's true. After he becomes accustomed to this idea, at the magic age of six, everyone suddenly demands that now he should learn, or if his birthday doesn't fall in the right place, he is told he can't learn for yet another year. The tragedy is that the optimum age for learning may already be passed. Children can absorb a tremendous amount of knowledge if the presentation is in the form of play, of visual and tactile experimentation.[2] Dr. D. O. Hebb says that intelligence is permanently impaired if a child is not exposed to sufficient physical and intellectual stimulation during his early years.[3]

What we are attempting to teach children in our schools may not be what is most important for them to learn. The teacher should be continually questioning whether the learner is actually becoming a more complex

[1]R. Dreikurs, "THE DEVELOPMENT OF THE CHILD'S POTENTIAL", EXPLORATION IN HUMAN POTENTIALITIES, Ed. by H.A. Otto, (Springfield, Ill.: Charles C. Thomas, 1966), P. 235.

[2]Ibid, P. 236.

[3]D. O. Hebb, THE ORGANIZATION OF BEHAVIOUR, (New York: John Wiley and Sons, 1949), P. 129.

organism day after day as a result of his learning. The judgment of complexity, however, cannot be limited to a consideration of reading paragraphs and sentences or spelling words. When a child is taken to a zoo, for instance, there is a period of total absorption and wonder that overtakes him as he views his first elephant. This is a very private and non-scholastic matter and essential to his understanding of this new creature. Our school system, however, is often more interested in how quickly the child can name the beast, remember its natural habitat and spell it all correctly.

The child encounters other new problems and situations upon entering the educational system. He finds that he is at once committed to a confinement in near space. This confinement reduces his normal visual exploration of near, mid, far and remote space to only one main area of operation. The situation is further complicated by his physical confinement to a desk. Dr. D. B. Harmon has estimated that the average school child spends approximately 80% of his school day engaged in near point tasks at desk or table top level and must make both a visual and postural adjustment to this containment.[1] For the most part, the rules of the game contain him in his two foot square "classroom learning space" and any unauthorized escapes either physical or mental are frowned upon. This causes a disruption, a situation he is not expecting and it forces him to select one of two alternatives. He may elect to reject the demand or find some method of adapting. If the elected course is rejection, he must withdraw, cease and escape. In this manner he can retain whatever visual

[1]R. H. Barsch, ACHIEVING PERCEPTUAL-MOTOR EFFICIENCY, (Seattle: Special Child Publications, 1967), P. 276.

efficiency he had prior to entering school. This may become manifest as distractibility, negativism, rebellion, lapses into daydreaming or other forms of behaviour which indicate his giving up on the task. If the child adapts, he must alter his operational modes to fit the restricting situation as well as alter his visual methods. He soon becomes aware of the demand to conform to standards, match his peers, satisfy his teacher and live up to the expectations of his parents. He thus learns that the academically oriented, near-point task is a way of life and represents the way of getting along in the world of school and society upon graduation.

The child who has not built up a previous array of adaptive experiences involving space may have serious problems with school-space confinement. Moreover, the child who has difficulty with space is likely to have similar difficulties in thinking.[1] Thus a problem that is likely founded in inadequate sensory-motor experience in childhood can become compounded at school age. Most of the school tasks we set for the child are complex activities combining many basic sensory-motor skills. If the basic skills necessary to this complex of abilities are lacking, the total activity may break down. For example, in the case of laterality not being established in a child, the resultant lack in directionality will cause certain relationships in the near space to be "meaningless". For this child there is no difference between a "b" and a "d" and no amount of telling or showing will adequately help this kind of a problem without the prior establishment of laterality.[2] Many children who present learning problems in elementary school classrooms appear to suffer from

[1]N. C. Kephart, THE SLOW LEARNER IN THE CLASSROOM, (Columbus Ohio, C. E. Merrill Books Inc., 1960), P. 94.

[2]Ibid. P. 32.

some of these basic difficulties.

As more research and experimentation takes place it appears more evident that there is a close connection between visual-motor coordination and such activities as reading, writing, spelling and thinking. The basic sense modalities of seeing, touching, hearing, smelling and tasting make up a kind of interlocking foundation which facilitates the higher order capabilities of the human organism.[1]

Dr. S. Rabinovitch of McGill University explains learning problems or disabilities as a maturational lag in a specific area of development.[2] The mass education system has very little tolerance for such deviation. It pushes children along in lockstep with narrow allowance for individual differences or lags and when a lag becomes apparent, the results are often serious. The child with a learning problem usually develops an overlay of emotional problems. If he is continually denounced as lazy and careless he feels stupid and inadequate and keeps failing in school. If this child's difficulties are ignored, the final result is often an emotionally disturbed, angry, hostile, frustrated "failure" who hates school and becomes a potential dropout.[3]

[1]Dusty Vineburg, "LEARNING DISABILITY", MONTREAL STAR, (May 31st, 1969), P. 36.

[2]Ibid, P. 36.

[3]Ibid, P. 71.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

CONCLUSIONS

From the preceeding chapters it now becomes evident that there are three main requirements necessary to lay the foundation for the fullest development of a human being.

1) The environment must offer rich and varied stimulus to develop the child's sense modalities. These must be of the widest range possible, from the haphazard of nature to the ordered from his parents, from the simple to the complex, from one source and from many simultaneous sources.

2) The child at a certain stage of development must have ample opportunity to integrate his sense modalities into a unity of systems. This will take place naturally when the sense modalities are mature enough and the child receives ample stimulation. The integration of some sense modalities will take place before others but under optimum conditions, an integrated, interdependent unity of systems will develop. This optimum condition is again one of stimulation but of a much more complex nature. The stimulation is now itself integrated, multi-faceted and demands understanding by more than one sense modality at the same moment.

3) The result of the development of the sense modalities and their integration into a unity of systems is the possibility of higher order cognitive functions such as language, art, mathematics, etc. (See Figure 1 below).

STIMULUS → DEVELOPMENT OF SENSE MODALITIES → UNITY OF SENSORY SYSTEMS → HIGHER ORDER COGNITIVE FUNCTIONS

Figure 1

As outlined in Chapters lll and lV, children today are not receiving enough stimulation nor the kind of stimulation needed to adequately develop their sense modalities. Our society and especially our education systems classify and separate the senses when exactly the opposite is required by the developing child. The education system then pushes higher cognitive function material, questions, information and modes of operation on all children indiscriminately expecting them to "learn". Most children are not adequately prepared for this because they do not have the foundations of the unity of systems or well developed sense modalities. Many of them have only been able to achieve a limited degree of development in a few areas.

The school system believes it can teach higher cognitive function understanding and usage by repetition, memorization and threats of punishment. This is a completely false attitude. The progression proceeds according to Fig. 1 and is impossible to reverse. It is impossible to teach using higher cognitive functions and expect results on a similar plane if the child has a deficient foundation. These are the principle errors committed by the educative system. Ones they have so far failed to recognize.

THE PARALLEL DEVELOPMENT OF ART AND THE CHILD

The premise put forward so far is that a certain developmental progression from stimulus to higher cognitive functions takes place in a child's development. It is also asserted that deficiencies in the

development of this progression will seriously hamper the resultant higher cognitive functions and that society and education in fact cause this to happen.

It will now be postulated that art education is the area most suited to help prevent and correct these deficiencies. Before this can be done, it is important to first examine the development of art as a higher cognitive function and the relationship it has to the developmental progression in the child.

Over many thousands of years man discovered that through systems of symbols he could abstract and communicate to others vast areas of knowledge and experience gained by his awareness of all aspects of his environment. Art was one of these systems. A man made tool born of sensitivity and dealing with existence, it seemed to fulfill a basic need in helping man scrutinize and understand his world and himself. There is indication from anthropological and psychiatric literature that certain similar visual patterns and symbols occur in different cultures in various parts of the world throughout history. Some particular occurances are not the results of migration and social contact, but develop as similar visual conceptions, independent of each other. It is likely that these recurrent patterns give direct visual expression to some basic patterns of human existence. How man experiences various stimuli in his environment and himself becomes internalized in these patterns and symbols. Thus, the cause of these universal patterns is not some inherited instinct or trait, but a natural outcome of the human mind's tendency to impose an order on its experiences. Simple geometric shapes emerge universally at an early age of mental development because they are most suitable and accessible to the limited organizing powers of a newly

developing mind. R. Arnheim states that: "When perception is pure and neutral, uninfluenced by the expectations or needs of the person, the simplest possible structure will prevail".[1]

These geometric shapes are retained in contempory civilizations for the purpose of schematic, symbolic or so-called ornamental representation. This is because they provide the most clear-cut images of the basic configurations of forces that continue to underlie man's life and therefore, man's thinking, even in refinement and complexity. The history of art shows that abstract styles of representation have prevailed, not as preparatory steps to more realism or perfection, but as the fully materialized, adequate expressions of certain conceptions of life and functions of art in life.[2]

Artistic abstractions have definite, positive psychological values for various cultures. These artistic abstractions are presented in the form of structurally simplified, essential features of the model, (i.e.: an interpretation of that model). This interpretation, through abstract representation occurs because man's orientation in his environment, so essential for his survival, takes place first at an essentially perceptual level. Thus, experiences become visual patterning through man's perception at the stimulus level.

Once man had evolved these visual patterns or symbols he could manipulate them in various ways. Since the patterns or symbols were abstractions evolving from his experience, man could combine them in a kind of unity that described the experience more clearly. He could handle and rearrange the relationships between sensory qualities such as size,

[1]R. Arnheim, TOWARD A PSYCHOLOGY OF ART, (Berkeley: University of California Press, 1966), P. 293.

[2]Ibid, P. 41.

movement, space, color, shape, etc. In combining these visual patterns or symbols, man was employing perceptual reasoning. The exercising of this perceptual reasoning over a period of time built up a language of visual symbols and patterns that formed the basis of art. Thus, art is a system of communication based on all man's past experience, his sensory development, his emotions and his ideas. It reflects the degree to which man is sensitized to his own self and his environment.

In a similar manner a child develops his higher cognitive functions. As outlined in Chapter 1, the child at first reacts to stimulus with sensory motor activity that leads to the development of his sensory modalities. In combining these modalities into a unity of systems he is able to develop higher cognitive functions such as language. The progression just outlined in art starts with the same base - environment stimulus. This leads to a development of visual patterns or symbols. The combining or uniting of visual patterns or symbols through perceptual reasoning results in the higher cognitive function of visual language or Art. Thus, there is a parallel development starting from a common point and resulting in higher cognitive functions, one of which is Art. But this development is more than parallel, it interacts, since it is through experience that the sense modalities are able to produce visual patterns; it is through perception that the unity of the sensory systems produce the unification of visual patterns; and it is through perceptual reasoning that the ability to perform higher cognitive functions can produce Art. (See Fig. 2).

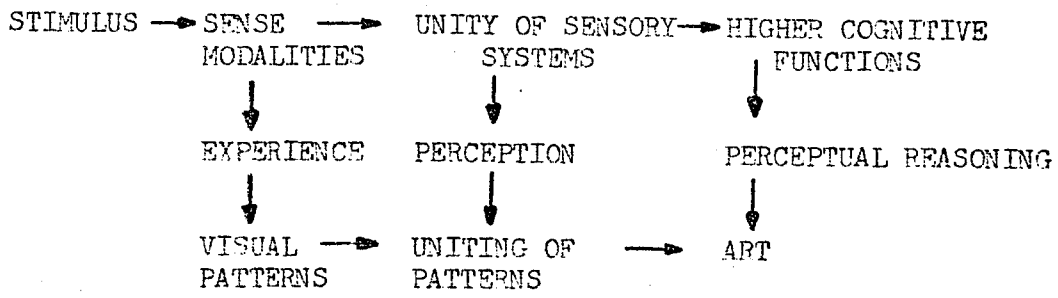

Figure 2

This parallism of development is the prime reason that art education is in such an advantageous position to help the child develop his full capacity as a human being. Secondly, it is apparent that the subject or discipline called art education has never really been taken as seriously as the other "major" disciplines in our school system such as English, Mathematics and Science. However, this can be turned to an advantage, for it is possible to exercise greater freedom of experimentation than would be acceptable in the other disciplines. Thirdly, Art Education is already somewhat engaged in the activities of sensory development, in exploring materials and ideas, etc. but has not gone nearly far enough. Teachers have usually approached the teaching of Art in the same manner that they approached other disciplines, that is to say, from the wrong end of the progression.

IMPLICATIONS FOR ART EDUCATION

The early school years should be handled along the lines of kindergarten classes. Later years should incorporate more and more sophisticated and elaborate extensions of these early activities. The projects must provide the learner with ample opportunities to explore his muscular relationships, varying positions of balance, parts of body, position in space, etc. Both student and teacher must have the opportunity to manipulate and alter these relationships by using time, light, sound, circumstance, etc. The learner must be able to "get the feel" of his environment physically and psychologically. He should "feel" the walls, floor, ceiling, trees, sidewalks, sign posts, etc., with his hands, his body, and his mind. He should be able to interact with these objects, be able to build with them, change their context and content, dissassemble them and re-assemble them. Simultaneously, he must be able to explore ideas, concepts, conventions, feeling, emotion, reason, and all the other facets of his developing knowledge and cognitive powers. Sensory systems and intellectual reasoning must not be separated or treated individually in the child. The teacher must be aware of the danger of allowing or encouraging motor acts to be performed without some cognitive participation by the learner. Jumping up and down, walking on a balance beam, and other such exercises will not develop cognitive processes by themselves. Similarily, coloring books, tracing, connecting the dots, and copying are activities that require no interaction of sensory systems and cognition and are therefore largely worthless.

Life and curricula should not be sharply separated, especially in the early years. Objects, events, emotions; everything of the child and everything in his environment is potential art material. His ex-

periences should not be separated from his self, nor his self from his surroundings, for these three, experience, self and surroundings form the basis of his art. Busy work that has no physical, mental or emotional relationship to the child is next to useless.

Art teachers are too often more interested in texture, shape, design and expressive form than in the "real" problems of the child who is struggling to establish his place and identity in the often bewildering array called his environment. Instead of trying to teach him space relationships using two-dimensional materials, it is more effective to use actual space with objects and distances the child can grasp immediately. For example, common objects, such as chairs, can be tied together by lengths of string exactly as long (or twice as long, or half as long) as the child is. He can lie on the floor and provide measurement from head to toe, or have a chair placed at each of his outstretched hands and feet. He can string measure his friend's waist, head, arm, etc., and use that as the distance between objects. Then the arrangement of chairs might be located on paper in half or quarter scale, or done in miniature with small blocks or other objects representing the chairs. In this way, art, personal involvement, mathematics, and geometry are all part of the same experience.

Children should be introduced to tools and materials so that their use and manipulation is not an isolated skill but a resource to solve a variety of problems. The child should not use the same tool in every situation, but reason out the right tool for the job. The proper use of tools can be taught by having him dissassemble pieces of machinery and then re-assemble them in a new way to make a new object. These mechanical objects should be such familiar things as radios, toasters, record

players, etc., to allow the child some insight into their function, design, structure, and operation. The same applies when handling new materials. Whenever possible let the child himself discover the right tool for the job. It is in the realm of art to re-arrange things, transform substances, and call new things into being. This is a natural endeavor of children who are exploring their surroundings and gives rise to new knowledge and feelings. The school should be a place where they can manipulate ideas and materials in order to find out who they are and what the world is like.

Another important aspect to keep in mind is the children's attitude to their art. They do not see it as something precious, something to be set apart, and separated from life. Instead, they "use" art and discard it after use. The "use" may be just in the making of it or the showing of it just one time. For example, a child enjoys the making of masks because it allows him instant personality transformation. He can escape or test and stretch the limitations of his own person. He is playing with his own identity and how that changed identity affects other people. The mask can have superhuman powers and thus suits his magical and psychological purposes. This is the "use" he sees in the mask. He makes it in a primitive manner, governed more by its magical power than by thoughts of beauty. Then when it has worked its magic (served its purpose), he readily discards it. The value to him was not the mask itself but the magic he imparted to it. Yet in the seemingly simple act of making a mask he has indulged in thousands of years of man's culture: he has found out something about his own person in physical and psychological aspects: he has manipulated material and idea into a vehicule of personal importance. In short, he has called up most of his developing faculties,

some of which are still very underdeveloped, to create an experience valuable to him. Once the experience has run its course, he no longer has any use for the art object - the mask.

The elements of design, such as balance, must be understood as part of the child's experience - not as some abstract concept shown him on a two-dimensional sheet of paper or blackboard. Balance has meaning because at an early age the child learned to crawl, to stand on two feet, and to walk. It is because of those experiences that he associates balance with security, with not falling, with not getting hurt. Balance has to be first fixed into his experience vocabulary in its physiological-psychological aspects and only later in its two-dimensional, abstract sense. He can then understand visual balance because of empathetic reactions which will give him a kind of pleasure, a feeling of completeness and security. Similarly, rhythm is an essential part of life. The child finds it in the seasons, his heartbeat, walking, music, machines, and so on. He can only understand the word or visual concept "rhythm" if its meaning is presented to him so that the relationship to his previous experiences is clear. A project that can help the child understand rhythm by using his body, and, at the same time, incorporate art, will strengthen the connection between personal experience and art. The teacher can have the students draw parallel lines on the floor, ground, or paper, and have a child walk on them in a parallel direction. His footprints can then be used as notes, and played on a musical instrument. If two or more walk on the "score", a whole symphony can be created. These can be tape recorded and rerun at different speeds to show variation. The paper with the prints can be hung on the wall, painted in and

thus present a visual rhythm to go with the sound rhythm. One child might make a musical instrument that best gave the sound of his heartbeat, another his eyes blinking, another his breathing, another his hair growing, etc., and then play everything together in a human rhythm band.

SAMPLE ACTIVITIES FOR CREATIVE LEARNING

1) Proportion or relative sizes are measured by the child using his own body as the standard. Thus his concept of "just the right length", or height may not be quite the same as another child's of the teacher's. Let him measure himself, his friends, objects, distances, and spaces in order to grasp these relationships using string the length of himself or his arms, etc. Have him make objects that are the right size for him, such as masks, hats, chairs, or make objects in half sizes or quarter sizes, like a shoe, bat and ball, pencil, etc.

2) Large crates, cardboard boxes or similar materials can be used to create living spaces. Holes can be cut in the sides, ceilings slanted or cut through, ladders built, decorations done inside and out. The shape of the inside can be varied by moving partitions, using a single source light, painting, etc. An environment can be built in a broom closet using these boxes. To vary the environment, the child can build the inside of an object like an apple, a horse, the human brain, a watch, etc. If possible, build a real room (child's playroom or bedroom) with all the articles that might go in it, some real, some made. The placement, color, size, etc., all become very important and personal to the child. He can bring in a few real articles from his own room to put in the made-up room, providing even a more direct involvement. The room could then be used as a stage or backdrop for drama, music, dance, etc.

3)Let one child place other children in different positions relative to each other and to objects. They might sit, lie down, lean on a table, hold a box, etc. The child director can build a sculpture, a house, an animal, or whatever he might think of.

4) Use dance-narration. Have one child narrate a story or poem he has written, another child play a musical accompaniment on an instrument he has made, another dance or act out the narration in a costume he has made.

5) Bring in machines in which the functional parts are easily seen and inspected. For example, a motorcycle is an exciting part of most children's experience. Let them lift, ride, push and handle it before trying to draw or make a three-dimensional model. If possible, do the same with animals and other interesting things.

6) Have large heavy objects sit on and crush smaller objects like boxes. Have levers and pulley systems to move the larger objects about. All the simple tools they hear about in science could be available and workable for these kinds of projects.

7) Place objects on the floor and cover with blankets or sheets. Let the children guess what the objects are by touching, smelling, or listening to them. Try it with things that move, that give off sound, light, or smell.

8) Try watching television or films with the sound off and let the children move about and try to tell what is happening. Reverse the procedure, shut off the picture and have just the sound.

9) Analyze music into rhythms, subject matter, instrumentation, repetition, variation, volume, etc., by having children act out these parts. They can build their own instruments, tape the performance, and put it to a film they might make.

10) Exploration trips and projects can help the child find out what kinds of spaces, buildings, and functional objects fell best or are suited for certain kinds of activities. They can compare spaces for

throwing, for kite flying, dancing, shopping, sitting, or climbing. They can examen functional objects like mailboxes, signs, benches, phone booths, and so on. Lead them to discuss the design, size, proportion, color, prominence and usefulness of these things. Let them design and build their own versions of some of these objects. If possible, children who have been exposed to these functional objects and spaces could design their own playground equipment and build it themselves or have it built on site so they can watch. These could be for outdoor, indoor, perhaps on the roof, up one wall of the classroom or in a near-by vacant lot. The operating space for these activities and projects should not be limited to classroom table top. Every bit of the child's environment is suitable, even essential.

Some schools are just beginning to become interested in what is going on in the student's head, rather than what is going on inside the classroom. This is a limited improvement. What they should be probing and studying is what goes on outside as well as inside the developing being as a whole, and what can be done to make the interaction of these two areas more useful to the life of the individual.

SUMMATION

We are presently a society that suffers from sensory illiteracy. However, there are movements and pressures beginning to resist these restrictions. We seem to be in a period of history in which past deficiencies in the development of basic sensory systems are causing changes in the thinking and approaches to many of our established social patterns. Our culture appears to be moving away from a long standing entrenched commitment to an egocentric and intellective mode of consciousness. The young are moving toward a sense of identity that is communal and non-intellective. Movements such as the ecumenical in religion, the interdiciplinary in academics and the multimedia in the arts all show that society's conventional divisions are beginning to break down. The current "turned-on" attitude accepts change as the nature of the universe and moves with it. Methods are being sought to break out of our restrictive frame of reference and get into direct contact with the nature of self and the world around. There is a desire to revive and extend the use of the senses, so long neglected in our development. Unfortunately, these trends are scattered, poorly organized without direction and unsupported by society as a whole and the education system in particular.

The symptoms of these problems are becoming more evident and the pressures for change are building up. Today we find 10% of our school children suffer from learning disabilities;[1] numerous sensory awareness, T-groups and sensitivity centers are catering to the pressured and harrassed members of society; and youth is turning away from intellective to

[1]Dusty Vineburg, "LEARNING DISABILITY", MONTREAL STAR, (May 31st, 1969), P. 71.

more active, physically involving, participatory activities. These reactions probably stem from insufficient opportunities for developing a non-intellective basis and manner of operation in our early years of life. These early experiences set the stage for the degree of efficiency the higher cognitive functions will atain.

Throughout our lives we are deprived of an important area of our natural learning power by a one-sided education. This could be avoided for the most part if recognition is given to the basic principles outlined in this paper. Art Education is in an excellent position to put these basic ideas into practice. The result will be a more balanced, creative human being, capable of dealing successfully with life in our highly complex environment.

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