DISADVANTAGED PUPILS
EDUCATIONAL INNOVATION
ARCHITECTURAL CONSEQUENCES

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SUBMITTED BY

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INTRODUCTION

The purpose of this report is to assemble in one paper the essence of some of the many things done in the areas covered. As far as possible this paper is comprehensive. It is intended to supply the designer with a survey of some of the factors that ought to be considered in the design of schools, especially primary schools, with a special focus on an area of current concern, the education of disadvantaged pupils.

The information presented represents a summation of a wealth of material available in the areas of education, disadvantaged pupils, innovations in education, and research in the design of schools for the implementation of educational innovation.

It is assumed that only innovative approaches adequately respond to the problems at hand. The reader is encouraged to use this paper as a starting point for his research and programme efforts. This implies that the designer takes limited if not complete responsibility for the design program. Architects who neglect to assume such responsibility will not derive much benefit from this paper. Nor will the education of young people derive much benefit from the designs of architects who refuse to assume such responsibility.

In carrying out the initial phases of investigation for this report it was found that the College of Environmental Design Library is dreadfully lacking in material on educational facilities design in general and specifically on the consequences of educational innovation

for architectural design of educational facilities. However, there is no lack of information nor work in the field. Educational Facilities Laboratory in New York, sponsored by the Ford Foundation, has set up projects around the country, and the reports from these projects are available, most of them at no cost, from the project laboratory or from the New York office. Anyone seriously con-cerned with school design should take advantage of EFL's work during the research phases of his project.

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SECTION ONE

MENTAL FRAMEWORK OF THE CULTURALLY DEPRIVED CHILD

The problem of the culturally deprived child has been tackled in many ways and the literature on the subject is exhaustive. The development of the mind of a disadvantaged child has been traced by different disciplines through his deprived environment, and analysed in terms of cause and effect. It is well-known that this mind contains as much potential for development as the product of a culturally rich environment, but that the education process is not sufficiently oriented toward developing that potential. The multiple causes for this failure are fully analysable, and stated elsewhere (30).

Our thesis is that there is much that is positive and educational in the mind of a child raised in the slums to which inadequate value is attached in present-day schools. Most experimental education attempts have been oriented toward the unlearning and overcoming of what the child already knows in order to remove these 'barriers' to further education. An examination of what could be construed as the constructive aspects of a child's knowledge and behaviour may lead to educational approaches with more fulfilling results, especially when balanced against some of the more negative aspects over which control should probably be exerted.

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(30) For this kind of nformation we have supplied the reader with a comprehensive bibliography throughout
For further reading in this vein, we would refer the reader to Educational Changes - Why? How? For whom? by Dr. Arthur Pearl of University of Oregon. distr.b. Human Rights Commission of San Francisco, 1254 Market Street, San Francisco.

This is not playing with words: it has been shown that the perceptual habituations of the ghetto child are not conducive to 'academic success' (1). Our argument is "To what then are they conducive?" Not only in terms of the concrete environment, but also in terms of the accompanying mind processes. By applying this reasoning 'academic success' becomes a flexible concept conceivably as natural to the disadvantaged child's perceptual habituations as it is now to the middle-class child's perceptual habituations.

The slum environment with its accompanying home problems cause the child to grow up with low expectations and few aspirations. His impoverished self-esteem is a tragic psychological fact, which leads to negative attitudes and a sense of inadequacy in most of the spheres of his existence. However, not every disadvantaged child commits suicide when he turns eighteen, which means that there are certain spheres of his existence in which his ego functions positively. Such accounts of ghetto life as are found in black literature suggest that these spheres of positive activity revolve around street activities and peer-group affiliations and their accompanying socio-cultural standards. We would therefore do well to examine them more fully.

Most approaches to the educational problems of the ghetto child start with his home background - often cited as the cause of his failure in school.

FN:

(1) Planning for the Language Development of Disadvantaged Children and Youth Eunice S. Newton. Journal Negro Education 33 pp. 268 - 9 Summer 1964

There are one or two important facts, however, which emerge from from the stack of tragic literature on the subject which may lead to different conclusions under closer examination. One of these is the child's unique lack of contact with the outside world. The sociologists decribe the ghetto community as 'encapsulated', meaning that it is isolated from the wider white world, and that its members tend to restrict their interests and interactions to each other (2). Many of the children who grow up on the streets have never ventured beyond a twenty-five block radius of their homes (3). Such familiarity with one's local geography, such committment to one's immediate environment constitute potential as yet untapped by the educators.

Jean Piaget has suggested an 'accommodation and assimilation' paradigm as part of the child's learning process, where continued physical interaction with the environment leads eventually to symbolic and linguistic functioning.(26)

FN:

(2) Up from Puerto Rico Elena Fudilla. N.Y.University Columbia Press 1958

(3) Minority Group and Class Status as Related to Social and Personality Factors in Scholastic Achievement Martin Deutsch. Soc. for Applied Anthropology. no. 2 1960 N.Y. Cornell University.

(26) The Psychology of Intelligence Jean Piaget. London: Routledge, Ke gan and Paul pubs. 1950
This interaction leads to the development of 'concrete operations' with which the child can mentally organise, integrate and differentiate the world around him. These then become'formal operations'. At each level the mental structure accommodates and assimilates the variety of stimuli and of problems, but there has to be a ' match' between the internal schema or operation and the external task or requirement for the learning process to be successful. If the environmental problems are too difficult, the child is frustrated and withdraws; if they are too easy he becomes bored and loses interest.

A second emergent fact from the 'culturally deprived' literature is the nature of the relations a child bears to the adults in his world. The slum family dwelling often houses an 'extended' family, whose members all look after the child at different times (6).(4) There is rarely a father present, and the mother is often at work all day, so that the matriarchal fadly and corresponding reduction in masculine role has led Frank Riessman to suggest the 'masculinisation' of the ghetto school curriculum (6). I would, however, recommend a careful analysis of the female role in American society before deciding to teach male superiority as a cultural norm .....

The controls exercised by the majority of low SES parents over their children are likely to be in the form of categorical authority with emphasis on obedience and responsibility. The child grows up to respond to these restraints rather than the the psychological pressure and internalised parental values that constitute the middle class's disciplinary forces (7). It follows therefore that discipline in ghetto schools should be as strict and categorical as that which the children receive at home (28) [illegible]. Support for this idea is provided by Richard Emery's description of the Harry E. Wood High School in Indianapolis(8).

FN:

(6) The Culturally Deprived Child Frank Rirssman. pub:N.Y. Harper & Row 1962

(4) Social Class, Race, and Psychological Development Martin Deutsch, Irwin Katz, Arthur Jensen. pub: Holt, Rinehart & Winston 1968 Wolf has secured evidence of the importance of a child's interaction with adults in cognitive ad emotionally stimulating settings through ratings on thirteen process variables related to deprivation.

(7) Who are the Socially Disadvantaged? Robert J. Havighurst. Journal Negro Education 33 pp 203 - 204 Summer 1964

(28) We suggest Beyond the Melting Pot Nathan Glazer and Daniel P. Moynihan. Harvard Press 1963 for further generalised information about the Negro home, and about the ethnic status quo in general.

(8) See next page

An 'armchair' analysis has shown that an infant developing in the deprived circumstances of middle-class poverty may develop well through the first year, begin to show retardation through the second year which accumulates through subsequent years. The answer is therefore a day-care centre or nursery school with some kind of pre-school enrichment programme with provision for situations designed to evoke the sensory schemata that Piaget has described (5). The problem is always to match materials and models to the stage of development: a problem whose answer lies in the 'untapped' potential of the environment already mentioned (25) (27) (32).

FN:

(5) An Instrument for Assessing Infant Psychological Development Uzgiris and Hunt 1966 1967 Univ. Illinois psychological Development Laboratory.

(25) An Academically Oriented Pre-School for Culturally Deprived Children Bereiter, Engleman, Osborne, Redford. Pre-School Education Today ed. F.M.Hechinger pub:N.Y.: Doubleday 1966

(27) For further information on the solution to 'the problem of the match' the reader is referred to (27) A Montessori Mother D.C.Fisher. N.Y.Holt, Rinehart and Winston 1912. Also to

(32) Compensatory Education for the Disadvantaged Edmund W. Gordon Programs and practices, pre-school through college. pub: N.Y. College Entrance Examination Board pubs. 1966

At one point fifty per cent of the school's pupils were rated as 'potentially delinquent' by their teachers, based on poor attendance, low marks, low IQ scores, low reading ability, and broken homes. Dr. M. Schwartz found in his follow-up study that only six per cent of the school graduates could be labelled delinquent. This is a ninety-four per cent prevention ratio (8).

So the unfriendly home atmosphere and the curbs on the child's natural curiosity and interests, the overcrowded and confused environment indoors and the subsequent lack of privacy and lack of scope for activity all consort to drive the child out into the street and into a gang. Thus the norms he internalises and the values he subscribes to will be those of his siblings and of his peer-group(9).

"In my neighbourhood the first things a kid learns are how to fight and steal and not to take crap from anyone."(10)

FN:

(8) Diverting the Delinquency Bound Richard E. Emery. Urban Education ed: D.D.Huddle University Indiana sept. 1967 "The unusual aspect of the vocational training is that the somewhat conventional program is supplemented by the application of what might be termed 'old-fashioned red brick schoolhouse technique' that combines parental manner and Golden Rule philosophy. That means that teachers...hold rigidly to a definite discipline reinforced, if necessary, with woodshed methods. ... This philosophy is identified and referred to openly as 'Big Daddy', and the youngsters have responded with trust and acceptance."
There is an article about 'Big Daddy' philosophy schools in TIME magazine February 8 1969

(9) Compensatory Education for Cultural Deprivation Benjamin Bloom, Allison Davis, Robert Hess. Research Conference on Education and Cultural Deprivation. pub: Holt Rinehart & Winston 1965.

(10) Crisis in Black and White Charles Silberman. pub:N.Y. Vintage Books 1964

Typically the culturally deprived child becomes physically aggressive and admiring of physical prowess (13). His interests are centred on the exciting and the active, and he prefers occupations which offer physical action (6);(14);(11).

FN:

(11) The Autobiography of Malcolm X Grove Press Inc. 1964 p127:
"The issue was the position that his action had put us both into. For a hustler in our sidewalk jungle world, 'face' and 'honor' were inportant. No hustler could have it known that he'd been typed', meaning outsmarted or made a fool of. And worse, a hustler could never afford to have it demonstrated that he could be bluffed, that he could be frightened by a threat, that he lacked nerve.
West Indian Archie knew that some young hustlers rose in stature in our world when they somehow hoodwinked older hustlers, then put it on the wire for everyone to hear. He beleived I was trying that.
In turn I knew that he would be rotecting his stature by broadcasting all over the wire his threat to me.
Because of this code, in my time in Harlem I'd personnally known a dozen hustlers who. threatened, left town, disgraced."

(12) Manchild in the promised land Claude Brown. pub:N.Y. Macmillan 1965. gives a graphic depiction of Harlem in the fifties as seen through the eyes of a growing boy. An example of subscribing to peer-group norms and group heirarchy is to be found on p.112:
"He said 'Go on and hit me as many times as you want', and I kept on hitting him. I hit him kind of hard, and he said,'Damn man, like cool it.' That wa enough. He said, 'Look, I'm gon hit you in your face. I'm just gon slap you with my hand, and I'm not gon tell you how many times. If you cry, I'm gon walk away, and I'm gon forget about it. And if you get mad, it's like the whole thing is just lost, and we gotta start all over again.' And I had to go along with it.

(13) Poverty in America eds: Ferman, Kornbluh, Haber. pub: University of Michigan Press 1965

(6) op.cit.p.5.

(14) Heal the Hurt Child Herta Riese. pub: University Chicago Press 1962
She has devised a therapeutic education for emotionally disturbed and troublesome black children, who are characterised by their energetic curiosity, by their drive to penetrate and intrude, by their weakness for stealing. She has emphasised the'homey' character of her clinic, inasmuch as it accepts the children without reservations and they then look forward to functioning in this framework. She maintains that "no therapeutic milieu must exceed the child's capacity to encompass its physical structure and to organise in his mind what he can conceive as its meaning and function".

The slum boy is intrigued by activities involving suspense, stress, and tests of endurance (6). It does not take him long to learn to attach value to that which is utilitarian and to short-range plans with their promise of immediate reward (9). He tends to do to depend on immediate satisfactions, and is more concerned than the middle-class child with all that is in imate, sensory, detailed, and personal (13) (29). 'Smartness' is highly valued especially as a 'capacity to acheive a valued objective with a maximum use of mental agility and a minimum use of physical effort.' As a result a high premium is placed on horseplay, inventiveness and re repartee (15).

This contrasts strangely with the commonly stated inability of slum children to comprehend or use language in school, and their corresponding distaste for reading, writing, and any kind of memorisation (15). Their ineptness at school language causes them to fail many of the standard tests and examinations which middle-class education is oriented towards. Most educationists recognise the problem, but their solutions do not overcome the fundamental meaninglessness of middle-class white language to lower-class black children.

FN:

(6) op.cit. p.5 p.7
(9) op.cit. p.6
(13) op.cit. p.7
(29) New Perspectives on Poverty eds: Shostak, Gomberg. pub: N.J. Prentiss-Hall 1965. Staughton Lynd suggests that this is related to the high rates of sickness and mortality in the ghetto, which results in value attached to the young body and its functioning.
(15) Education in Depressed Areas ed: A.H.Passow pub: N.Y. Univ. Columbia 1963

A child's speech is 'shaped' by selective reinforcement - which also constitutes training in auditory discrimination. Thus learning language is a matter of the child continually aspiring to the higher more complex level of language used by the adults and older children with whom he interacts (4).

Sociologist Basil Bernstein found that lower-class spoken language is less like written language syntactically, grammatically and in overall sequential organisation. Consequently there is less positive transfer from the verbal experience to books and magazines. Much ghetto language is a kind of emotional accompaniment to here-and-now action, and it does not serve an expository function, as in the middle class (24).(6).

Another comment from Hertha Riese is pertinent to the problem of teaching language: "It is both the willingness to accept and the willingness to release knowledge that the child needs to be stimulated."(14)

Similarly there is a failure in the education field to recognise the invalidity of perceptual symbols and orientations commonly employed in the school environment(4) .

FN:

(4) op.cit. p.5

(24) Language and Social Class B. Bernstein. British Journal Sociology no. 11 pp. 271 - 276 ,1960

(6) op.cit. p.5 p.7 p.8 Walter Murray found ghetto language to be rich in simile and analogy, with great inventive word power. Martin Deutsch has shown that the ghetto child's verbal impoverishment is most in evidence when he is presented with highly structured tasks; he suggested a verbal enrichment technique with a free flow of language in more unstructured situations may help the ghetto child le meet his potential. He tends to verbalise the immediate visual experience than to respond to language.

(14) op.cit. p.7

(4) And Martin Covington has done experiments which prove that low SES children are at a perceptual disadvantage in school, and that they consistently do worse in discrimination tasks, except where they have reveived special training or experience. (1967)

This is not due to insufficient visual stimulation in the crib, as some psychologists have suggested (4) , but the distinctive features of a low-class home do not correspond with those of a middle-class home; and according to the Gibsons perceptual discrimination is the direct result of the visual definition of the stimulus (4). As the learning orientation of a culturally deprived child is primarily visual, a reorganization of the learning environment in the light of this evidence would have positive effects on the learning process.

This in turn would favourably affect memorisation - that indispensable learning aid - but as Ian Hunter says," Learn-ing procedures which can be suggested to(the pupil)must, to become effective, be implemented by him. He must undertake to modify his own activities, learn what to do and when. The acquisition of improved learning techniques is like the acquisition of improved techniques in golf, or swimming, or musicianship: it can only be brought about by selectively directed effort on the person's part".(16)

These children have shown themselves to respond to colourful commodities and machines (6). It is therefore necessary to engineer the attention of the child by organisation of the stimulus field or by appropriate explanation to the child. Also advertisers' perceptual principles could well be applied to classroom organisation and to the design of books and equipment. The placing and spacing of visual stimuli can, of course, heighten the value of a display (4).

FN:
(4) op.cit. p.5 p.9
(16) Memory Ian Hunter pub:Penguin Books (london) 1964
(6) op.cit. p.5 p.7 p.8 p.9

Children from the slums learn not to listen in their homes: minimisation of external noise and a compelling auditory signal are the physiological antidotes to this problem. Such teaching aids as earphones taped stories, and 'listening centres' create a situation that is conducive to auditory training both physically and psychologically (4). The evidence in this field of sensory training seems to point emphatically to to wide-spread use of much of the new teaching media known as 'audio-visual', and to teaching machines (33) (23)

The impoverished and crude interior of the average ghetto home means that the child is likely to come into extended contact with sensationalist literature and also with television (17)(18). However improper these may seem in the context of the middle-class child's environment, they do constitute two doors into the world of the slum child. They do not leave his mind unaffected - therefore when planning an education for that mind one should take these items into account.

FN:

(4) op.cit. p.5 p.9 p.10

(33) This has been dealt with again and more fully in a later part of the paper.

(23) Children and Adolescents B.R.McCandless. pub:Holt, Rinehart, Winston.N.Y. 1962 : an experiment by Irwin is quoted herein. He had mothers in the slums read to their children for at least ten minutes a day from the age of one. A group of similar mothers were given no such instructions. Subsequent measures of language development showed significant differences between groups at twenty months of age.

(17) A Cure for Allergy to Reading Charles Spiegler Education Digest no. 29 pp. 36 - 38 April 1964

(18) Television and the Child Himmelweit, Oppenheim, Vince.pub: Oxford University 1958. They made a wide survey in England, and determined that the effects of television on a child's way of life are not very profound. There are tendencies, however, for a child to fall into the habit of watching, and for him to avoid serious or educational programmes when there are a number of channels for him to choose from. The appeal of television seems to lie largely in its availability, and its time-filling function. Some parents also use it in a rewrad-punishment capacity. Programmes are unlikely to instigate any specific behaviour, but they can and do instigate interest and intrigue which should be used by the teacher in the classroom.

One of the more inevitable and unrewarding aspects of television is the distorted portrayal of the white world that it presents, to which a black child is particularly susceptible (19). The pre-school and elementary school periods are recognised as crucial in the development and differentiation of a child's feelings about himself, and about others who are ethnically different. This process begins at age three and the damage is effectively wrought by the time the child is about seven (4). Numerous experiments have demonstrated the devastating effects on a person's mind of growing up with a black skin (20) "Negro children are clearly more uneasy than white children about the topic of race..... They are compulsively interested in the topic, and extremely uncomfortable with it. They are personally involved, evasive of realities, wishful of unrealities (19).

The new emphasis on black pride and black nationalism is removing many of the ambiguities from the black child's education, and it will clearly benefit him to have in the school curriculum not only more time and respect devoted to the history of his race, but also to an understanding and acceptance of the concepts of race and racism as they exist in the American mind today. This

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FN:

(19) Race Awareness in Young Children Mary Ellen Goodman. pub: Cambridge: Addison Wesley Press 1952

(4) op.cit.p.5 p.9 p.10 p,11

(20) Black Rage W.H.Grier M.D. P.M. Cobbs M.D. pub: Bantam Books 1968 Written by two black psychiatrists who have worked extensively with their own race, this book contains the most graphic and dynamic presentation of the problems of the black ego of any we read. p.175: "A life is an eternity and throughout all that eternity a black child has to breathe the foul air of cruelty. He has grown up to find his spirit was crushed before he knew there was need of it. His ambitions, even in their forming, showed him to have set his hand against his own. This is the desolation of black life in America."

should result in an attitude calculated to bolster the black person's self-image, the negativity of which has caused many a philanthropic educational attempt to slip and fall(4) (21) .

Georgene Seward observes: " Before a child is conscious of being a Negro himself, he is affected oby the tensions of his parents over their being Negro(4). This is more likely to be the case than "the child sensing that the larger society xiews him as inferior" (4) because as we have seen his contact with the wider society is limited during most of his childhood. It is also unlikely that he will identify with his parents until a later age, partly through lack of contact with them, and partly because the 'identity crisis' according to Erikson does not take place until adolescence(22). Thus the Negro's committment to a negative self-image is not unredeemable, and could conceivable be overcome by compensatory experiences at an early age: the Ausubels state that "the foundation of intrinsic self-esteem is established in the home"(15).

Considerable evidence supports the idea that personal or self pride is essentially the expression of group pride, which can be nurtured by 'social insight' - i.e. a man's undersatnding

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(4) op.cit. p.5 p.9 p.10 p.11 .

(21) Profile of the Negro American Thomas F. Pettigrew. pub: D. van Nostrand N.J. 1964 presents a comprehensive and well-classified survey of the tests and studies performed in black communities, especially with reference to the poor self-image. Pettigrew himself has done much work in this field. He has pointed out that by growing up to assimilate the values of American society, a Negro will evaluate himself in that light, and cannot help but fall into a servile and inferior role.

(22) Childhood and Society Erik Erikson.

(15) op. cit. p.8

of his Group's dilemma. For example, a Negro needs to view white society and the white man as the source of his difficulties and not himself. He must also be able to see possibilities for action (15) . These functions are slowly being fulfilled by such groups as the Civil Rights Movement, the Black Muslims, the NAACP, and the Black Panther Party. Il y en a pour tous les gouts.

Such boosts to the Negro morale are having their effects on their achievement and aspiration levels. Rosen's 'achievement syndrome' suggests new drive in three spheres: as a personality characteristic, as a value orientation, as an educational and vocational aspiration (4) . All three of these are becoming more pronounced and will continue to do so if the black man continues to believe that he is beautiful; whereas in the past Negroes' aspirations have been characterised by unrealistic-ness, and also by the lack of "knowledge to the means of acheivement" (4).

Brief though it is, this survey has attempted to characterise some of the more positive aspects of the ghetto child's mind - for the educator as much as for the designer, for these are the two people in whose hands the ghetto school's future lies. It is our conviction that there is much here to work with. The first and most fundamental steps towards 'positivising' the negative attitudes about Negroes and about their education have already been taken by themselves in their

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FN:

(15) op.cit. p.8 p.13

(4) op.cit. p.5 p.9 p.10 p.11 p.13

courageous strivings towards a new identity.

Hertha Riese has pointed out that the Negro child thinks of his colour as a fundamental mark against himself. He feels therefore that he has to justify his existence, rather than to fulfill it. The privilege of orienting one's life towards self-fulfillment has been taken for granted by white people everywhere. It is effectively condoned by the education process. When the culturally deprived child can grow up to use that privilege to an equivalent extent, then education as it exists in the vast proportion of the American community will really be functioning to provide equality of opportunity for all.

SECTION TWO

PROBLEMS OF ARCHITECTURAL DESIGN OF "GHETTO" SCHOOLS

The problems of architectural design suggested by the special nature of the school for "culturally deprived" students has not been dealt with deffectively. In the past it has been assumed that the principle difference between ghetto school design and middle class school design was a question of making the ghetto school non-destructable. Burglarproofing and vandalism-proofing the school seemed to be all the challenge the architect faced, and he prided himself on his success in designing a structure which had all of the attributes of a prison without looking like a prison.

It is not unusual to find architects who deal only with physical problems and their physical solutions. It is unusual to find architects who are concerned enough about the uses and users of their buildings to go deeper than the scratching at the surface of the problem represented by past efforts in school design. Some of the innovations in education coupled with an increasing demand on the part of the poor minority groups for meaningful education are bringing about a shift in emphasis, and some architects are already responding with school design which is suitable for valid educational activity.

In the following section we will examine educational innovation in order that we might be able to discuss design of schools in light of the best that current theory and practice have to offer. Nothing less than the best will begin to solve the problems which education of all

the people of the United States in a manner sutied to the present and the future require of our educational institutions.

SECTION THREE

EDUCATIONAL INNOVATION - CURRENT THINKING

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5. LEARNING

   a. Independent study

   b. Discovery learning-active involvement

   c. Pre-school education

   d. Unlimited learning

   e. Intrinsic Motivation--participative/creative activity

   f. Groups (playing roles, forums, games)

1a. NON-GRADING

"A non-grade school is a place which makes arrangements for the individual student to pursue any course in which he is interested, and has the ability to achieve, without regard either to grade level or sequence."

["The Non-Graded School", B. Frank Brown; In The Revolution in the Schools, ed. R. Gross and J. Murphy, 1964, Harcourt, Brace and World, Inc., New York. p. 100.]

"It is an educational design planned around an individual readiness for learning rather than around rigid administrative requirements."

[Ibid.]

Grading is an administrative facilitating device. Non-grading is an "administrative prickly pear." Non-grading demands an administration responsive to individual learning needs.

Non-grading eliminates grade levels, is supposed to raise the ceilings and lower the floors of educational expectancy, and promises to correspond with the full range of individual differences in a class group. Presumably, it encourages continuous pupil progress uninhibited by grade barriers; subject matter organized sequentially around fundamental concepts, principles and generalizations; distribution of materials to correspond with the range of individuality represented in the group; alternative group placements for students based on individual pupil diagnosis; and so on.

However, the concepts, form, and nomenclature of grading are not easily swept aside. Even when discussing non-graded possibilities, we still use the language of grading simple because we have not yet

developed a non-graded vocabulary. Schools continue with the substance of their old ways even when using the label of an innovation. Consequently, it is not surprising that a recent doctoral dissertation drew the conclusion that very few truly non-graded schools exist in the United States.

The non-graded concept, fully implemented, has profound implications for virtually every aspect of school practice. But many educators have proceeded with what they call non-grading as though a relatively minor organizational change would suffice. Unfortunately, there are few operational modes. But the few in existence are visited by thousands of teachers, administrators, and college teachers each year, suggesting that the plan primises solutions to persistent educational problems.

[For a complete discussion of non-graded schools, see Goodlad's article, "Meeting Children Where They Are," in Saturday Review, March 20, 1965.]

Ib. ADMINISTRATIVE REFORM

Substitute vice-principal with administrative and managerial skills (not necessarily an educator) for current type of vice-principal. This frees principal to concerns of education alone: curricula, teachers and students, and parents (and others from community.)

Teacher Participation--Student Participation

In some private schools there is no principal. The teachers enjoy an unusual amount of control in some cases, the students run the school in others. Student control is more appropriate in the later years, but in some forms, could be extended downward to involve students more at every age level. There is no set pattern for this administrative shift, but the involvement of teachers and students at the policy-making and administrative levels has some definite benefits which should be mentioned.

Increased participation generally results in increased commitment to and involvement in the educational process.

Ic. FLEXIBLE SCHEDULING

The term "flexible scheduling" is used to imply the elimination of the traditional scheduling of class hours within defined times and durations. In the non-schedule approach, the opportunities for a variety of activites is maximized. A modification of the non-schedule which retains some of its positive possibilities is the use of short modules of time (e.g., 20 minutes) in various combinations. This allows for a certain amount of flexibility within the framework of an ordered sequence.

2a. ETV - EDUCATIONAL TELEVISION

Educational television means a variety of things in a variety of situations. Generally, it implies a closed network using live or taped programs for classroom use. It can be used as much as a means of teacher on-the-job training as for the presentation of material to students.

2b. COMPUTERS

The prospect of computers taking over the presentation of subject matter is of less immediate significance than the insight this experimentation is providing into how to select and arrange stimuli for effective learning and how to deal instructionally with individual differences. The computer, where it exists in public education, is performing relatively mundane tasks of storing and retrieving personnel data, meeting payrolls and scoring tests.

However, the intriguing prospect of electronic teachers assuming a significant share of instructional presentation rises before us. There is a fallacy, I think, in the common point of view that such robots cannot or should not replace human teachers, but should serve as supplements to or tools of the latter. Such a view will assure us pedagogical dark ages. We have ample evidence to show that teachers, like other workers, do not readily extend their personal powers through mechanization or automation. Automation is introduced by others; the worker adapts or becomes obsolete and is surplused. Witness the large, automated tankers now being introduced in the business of transporting oil. The crew is very much smaller and performs tasks that are quite different from the tasks performed by crew members a decade or two ago.

One can argue that teaching is a distinctively "human" enterprise. True, but experimentation is revealing that human surrogates can do parts of it better. This fact does not exclude human teachers from the teaching-learning process. But it does suggest some radical departures from the telling roles so predominantly assumed by teachers

yesterday and today. These observations point again to the need for fully independent experimental schools and research centers wherenew conditions of instruction are created and studied quite apart from the politics and bureaucratic rigidity of our massive educational enterprise.

However, the use of the computer in education presents tremendous possibilities for information retrieval systems. On a large scale computers could be employed effectively to deal with the information overload experienced today through the proliferation of printed material.

A group of universities could be the client for an effort to deal with the problem through the use of computers. All printed material available in the several libraries of the universities involved could be catalogued and coded in one central computer system. The student, faculty member or whoever could have a small catalogue in his home or office along with a telephone-type dialing system connected to the central system catalogue. In conjunction with his dialing system, each person would have a small TV-type screen. Thus, by using the brief catalogue at his console the user could proceed to narrow down the breadth of his enquiries until he comes to a bibliography dealing with the subject of interest to him. He would then be able to choose a book, see its table of contents, choose a chapter, and read whatever was of interest to him. New publications could be programmed in as they were issued.

2d. AUDIO-VISUAL

Radio, television, films, film strips, taped lessons, and recordings are no longer innovative. A generation of today's mature adults grew up in their presence. Enclyclopaedia Britannica Educational Corporation has some 800 films and 4000 film strips in its inventory. And yet, the reaction of the education profession to the plethora of instructional riches can be described as apathetic. Textbook and telling still dominate. We must build our buildings, construct curricula, and educate teachers so that ignoring these instructional alternatives becomes exceedingly difficult.

3. CURRICULUM

Piece-meal, discipline-centered curriculum reform of the past decade represents a response to the knowledge explosion and the growing need to use time better. The subject, from which both ends and means of schooling are now being derived, is to be retained as a separate entity in the school's program. Topics in each field are to be organized around primary structural elements: concepts, key ideas, principles, and modes of inquiry which tend to persist over relatively long periods of time. Understanding these elements is presumed to give the student power--power to attack previously unknown problems and power to grasp intuitively the relationship of new phenomena not pe previously encountered to phenomena already experienced. Therefore, ability to think inductively becomes a built-in goal; teachers are encouraged to let students discover meanings for themselves. Increasingly, because of this curricular approach, students should be able to cope with a world of expanding knowledge.

The separate-subject approach to curriculum planning is not without its problems. Those subjects traditionally in the high school program, whether or not previously combined with others, and especially when seen as closely related to national welfare (hence mathematics, biology, ch chemistry, physics, and foreign languages) have received added support. But those previously receiving little or no attention--as economics, law, psychology, political science, anthropology, sociology, and geography, now have an even more difficult time in finding a toe-hold. Add to th this the facts that curriculum reformers in the well-established fields wnat extra periods or another year or both, that the position of the arts always has been tenuous, that we are not at all clear on the role

of the secondary school in vocational education, and formidable time problems emerge.

The problems of an elementary-school curriculum organized around discrete disciplines are no less troublesome. Since the search at the high school level has been for root concepts in each field, what of a more basic nature is left for the elementary school? Presumably, these same concepts should be taught at a simpler but, nonetheless, honest level. The search for the beginnings of truly fundamental concepts and for ways of introducing them effectively to the very young has proved both challenging and baffling, separating the men from the boys in curriculum reform.

An equally baffling task has been selection of subjects to be included. Which of the many natural and social sciences, for example, should be chosen as first priorities among all those available? There simply is not room for thirty or more separate academic disciplines. Subjects must be combined, alternated one with another, or placed in an hierarchy of significance.

One possible solution for the choice problem is to <u>select and teach key ideas</u> from a broad realm of knowledge, irrespective of the subjects to which these ideas most closely belong. This approach is likely to characterize at least some future planning in the social studies where the possibility of allocating time to each social science is remote. It is possible to select topics which give attention, at various times, to fundamental concepts such as supply and demand (economics), due process (law), consent of the governed (political science), cultural evolution (anthropology), and so on, without identifying each subject and giving it a place in the curriculum. This

approach smacks of the much-maligned broad fields type of curriculum organization practiced in the '30's and '40's. But with a critical difference. Scholars in the various academic disciplines were not then involved in the difficult process of identifying in their fields what is worth knowing and teaching at pre-collegiate levels.

Another possibility for taking care of the plethora of subjects struggling for recognition in the curriculum is to identify intellectual processes common to several related disciplines and to teach for them, again without providing a place for all the disciplines represented in a realm of knowledge. This is a significant aspect of Science--A Process Approach for the elementary school, sponsored by the American Association for the Advancement of Science, which is organized around desired behaviors such as the following: observation, classification, recognition and use of space-time relations, recognition and use of numbers and number relations, measurement, communication, inference, and prediction. Shades of John Dewey!

The criticism of both approaches is that they sacrifice the ways of viewing and thinking about knowledge that constitute the very essence of current discipline-centered reform. We are back in the classical either-or curriculum dilemma in which we seem unable to have our cake and eat it, too. Exploding knowledge suggests the need for exposure to breadth. But power to deal significantly with any aspect of the knowledge explosion seems to demand depth.

There is a way out of this dilemma which we have been patently reluctant to follow. Let us assume, first, that there is enough wisdom on each side of the long-standing breadth-depth argument to warrant

substantial recognition for both. History supports us in this assumption. We alternate at intervals from thought and practice emphasizing breadth to thought and practice emphasizing depth, with the latter position firmly in the saddle at present. Soon, since change is bound to occur and since change, by definition, is movement away from what exists, there will be a fresh emphasis on general education.

Let us assume, second, that virtually all of our young people wil will complete high school. Let us think therefore, of pre-collegiate education in the full sweep from nursery school or kindergarten through the secondary school. And let us remember, too, that children and youth go through distinct phases of development, determined by both biological and environmental factors, even thoughth this development is irregular and markedly different from individual to individual.

Should we not think and plan, therefore, for successive phases of schooling, each with unique and distinctive functions as well as common school functions, and each geared as much as possible to successive phases of human development and societal expectation? Thus, the early childhood phase might devote itself over a period of two or three years to the development of awareness, self-confidence, and hai habits of thought; a subsequent phase of three or four years to fundamental skills of speaking, reading, and writing; a later phase to significant ideas and modes of thought irrespective of subjects represented; and a still later phase to the strategies of discrete ac academic disciplines. With phases overlapping each other, a student might be in more than one at once, according to the irregularity of his growth.

The "phases" concept of schooling proposes a cycling of curricular emphases for each individual, adding up to experience in all of them by completion of high school. This is in marked contrast to traditional processes of cycling by generations, in which an individual completely skips a curricular emphasis simply because of when he happens to live.

Our continuing curriculum sin is that we vacillate from excess to excess, with what is currently fashionable in curriculum thought being applied indiscriminantly to the whole of formal education, from nursery school through college. Needed is thorough appraisal of functions thought to be appropriate for each successive phse of schooling, translation of these functions into precise educational objectives, and allocation of human and material resources specifically pertinent to attainment of these objectives. These are tasks for state and local school systems, aided by the research and development centers and regional laboratories now made possible by actions o of the 88th and the 89th Congress of the United States.

We have no models for this work. Local school districts, which experience the vexing problems of curricular choice most directly, l lack the resources for the development of comprehensive curriculum design. State departments of education are not staffed for the job. And even a cursory analysis of the hodge-podge approach to curriculum planning provided by most states reveals that these agencies are not at all clear on their leadership role. The curriculum staffs of colleges and universities, with only a few exceptions, are very weak. They ha have offered neither ordered, conceptual schemes by means of which curricular problems might be placed in perspective nor research on

anything other than minuscule problems. The time is come to rise above parochial considerations in the creation of cooperative approaches to curriculum study and improvement which bring together research, facilities and techniques for field testing, and machinery for implementation across the whole length and breadth of the curriculum.

Subject-by-subject curriculum reform is an important, never-ending enterprise but, by its very nature, it cannot resolve the comprehensive curricular issues involved in using school time wisely. These are the issues to be faced in a second wave of curriculum reform, scarce begun, the issues of planning total curriculums for all the children of all the people.

["The Knowledge Explosion and the Use of School Time",
John I. Goodlad, University of California, Los Angeles,
and Institute for the Development of Educational Activities]

3a. EARLY PRESENTATION OF DIFFICULT SUBJECTS

In recent years, educators have discovered that many subjects formerly reserved for high school or college can be presented to youngsters much earlier in their educational careers. This means introducing science and math at the lower levels of elementary school education. Even more important, it means discarding our old notions of timing and sequence in education.

3b. ADAPTATION TO INDIVIDUAL CHILD

What is meant here is essentially the basis for all new thinking about education in recent years: The school and the teacher must meet the child where he is, wherever that may be. Traditionally, all children were expected to meet the school where it said children of a certain age ought to be. We now recognize that children are different; that these differences are good; and that school should encourage full development of the child through his differences, not in spite of his differences.

Therefore, schools must be equipped to diagnose and prescribe for the different individuals who enter. They must ask the question, "What is this child ready for?". Criterion standards must replace nominative standards for measuring progress.

3c. INTEGRATION OF CONCEPTS

The term "integration of concepts" implies the development of curricula based on the key concepts in very broad areas. For example, molecular theory traditionally appears in physics and chemistry courses. The integration of concepts would build the entire science program around key concepts such as molecular theory. Primary school courses might be divided into the categories of science, math, reading and the arts. Even these categories would attempt a total integration of concepts in the curricula.

3d. PROGRAMMED LEARNING

Most of the new curriculum projects make some use of programmed techniques, more clearly evident in supplementary materials than in basic textbooks. The concepts involved are simple but powerful, reflecting several decades of productive study into the nature of learning. After determining precise goals to be attained, the programmer breaks down subject matter into series of sequential steps or sets. The learner is immediately informed of his success or failure, repeating or progressing according to his response and at his own rate of speed.

An interesting application of programming concepts is found in the Oak Leaf School, a public school serving as a laboratory for the Learning Research and Development Center of the University of Pittsburgh. Teachers, working with specialists from the University, put together programmed sequences of instructional materials and exercises from many sources and some of their own creations (especially in science). Students secure instructions from boxes of filed directions, select the next lesson, take series of tests, and proceed at their own rate through segments of the curriculum. Teachers are on hand to assist and teacher aides perform a variety of relatively routine checking and filing tasks. A research staff analyzes the results and makes recommendations for improving the program.

More on the experimental frontier, but still relying heavily on the psychological concepts underlying programing, a handful of centers across the country has extended the teaching machine with the use of computers. The laboratory of the Learning Research and Development Center (University of Pittsburgh) combines computers with a variety of visual and auditory stimuli in experimenting with the reaching of reading, mathematics, spelling, and other fields. One of the most ambitious efforts is that of Suppes (Stanford University) whose Computer-Based Mathematics Instruction Project transmits stimuli and quick feedback on students' responses to neighboring public school classrooms.

(State Committee On Public Education
Project III: Instruction by
John I. Goodlad)

4a. TEAM-TEACHING

"A team may consist of only two or three teachers, or it may be a larger group including a team leader, master teachers, specialists, aides, and apprentices. It may be found at all levels, elementary; junior, and senior high school. When comparing different team teaching projects, one is impressed with their great diversity, in both aims and methods of organization. Their common properties are much more difficult to identify, particularly since each program tends to define itself in its own exclusive terms. A definition that embraces a majority of the present efforts might be: Team teaching is an effort to improve instruction by the reorganization of personnel in teaching. Two or more teachers are given responsibility, working together, for all, or a significant part of the instruction of the same group of students."

("Team Teaching", Judson T. Shaplin;

The Revolution in The Schools, p. 93)

One of the benefits of team teaching is the increased communication flow among teachers and the increased feedback to individual teachers.

4b. TEACHER AIDS

Teacher aids perform many of the clerical tasks, study hall monitoring, etc. which could easily be performed by people with less formal training. The newly created "free-time" could be applied to class planning, teacher-to-teacher communication, or teacher involvement in the community.

4c. TEACHER TRAINING

Pre-service: the concept of teacher training must be re-designed to provide the education system with the qualified people required to meet the demands of the new educational goals and modes.

In-service: Teacher education should reflect the philosophy of education which is being presented to the teachers. The only way to do this is through the active involvement of teachers in their own education. In-service programs should be enlarged. Teacher training should move off the university campus and into the primary or secondary school classroom. Internships should replace the present graduate school programs. Interns would have a reduced number of teaching hours in order that they might spend more time in seminars with other interns as well as veteran teachers, in independent study and in research projects. Internships could be combined with residency programs, new pay scales could be developed, and credential criteria could be established. But teacher training must not stop with the receipt of a credential.

4d. EVALUATION TECHNIQUES

Currently teachers are paid on the basis of seniority and the degrees they hold. This system should be revised so that compensation can be based on job performance. Team-teaching provides the opportunity for peer-evaluation, so that some new data would be available. Other methods of teacher evaluation need be developed if the profession is to meet the challenge which it faces.

4e. MASTER TEACHERS

The concept merely provides for the use of specialists, interns, aids, associates, etc. by placing one person in the position of general overseer of a large number of students and teachers. It is an organizational concept rather than a pedagogical one.

4f. SPECIALISTS

Traditionally certain subject areas have been taught by specialists. These areas include music, art, dance, and physical education. More recently the concept of specialists has included reading skills, study skills, and studied based on the use of new equipment. In team teaching, each teacher becomes a specialist, and the specialists coordinate their activities.

4g. STUDENT TEACHERS

A technique which has been successfully used to involve the disinterested high school student (potential drop-out) in the education process has been the assignment to him of teaching responsibility. A 7-11 program illustrates this approach wherein 11th graders are assigned to teach groups of individuals at the 7th grade level. In his new role the student teacher becomes involved in his "job" as a teacher. His assigned teachers become his consultants. His learning focuses on the material he teaches. His studies take the form of research and lesson plan preparation.

(See Arthur Pearl's writing on this)

5a. INDEPENDENT STUDY

Although more applicable in the later years, the concept of independent study ought to be extended downward as far as possible. The term is self-explanatory. It is similar to the program of a graduate student inasmuch as the student selects his study area and develops a program with a member of the faculty.

5b. DISCOVERY LEARNING

This is one of the more popular ideas in learning from the noise made about "progressive education" during the 1950's. Simply enough, it implies that the child learns more by discovering concepts than by being lectured to or by reading about them. This is fairly obvious and pretty fundamental. Only the most conservative of educators could fail to agree with the concept, but only the most advanced have applied the concept. Nearly all of the innovations discussed here recognize this premise as central to learning theory.

Of course, active involvement is essential for discovery learning to take place.

5c. PRE-SCHOOL EDUCATION

Our old notions about the ages at which children are ready to learn are all being invalidated by current experiments. Increasingly, the evidence points to the importance of the experiences during the first five years in the formation of the child's mind and learning habits. It is logical, therefore, to conclude that education should be begun earlier on a more serious level than the traditional nursery school programs.

5d. UNLIMITED LEARNING

The notion that the knowledge of a certain subject is a finite and measurable quantity is absurd. The implication is, therefore, that courses don't really have ends, or ought not to have them. current practice leads to student to believe that there is such a thing as finishing the study of such-and-such a subject. Built into the course work ought to be the notion that the course is only the first step in the study of the subject. Furthermore, the course should be designed to facilitate further learning in the subject.

5e. INTRINSIC MOTIVATION

It is recognized that learning takes place at a greater rate when the student is motivated by the activity of learning rather than by the traditional reward and punishment system. Good marks and passing on to the next course are the usual means of rewarding students. Recent studies show that these are part of a very inefficient system from the point of learning rather than for administrative facility.

Generally, participation increases motivation. The so-called creative activities such as visual and performing arts involve the students in their activites, and motivation for these activities is generally high. The model of active participation in the performing arts needs to be applied to the other courses in which participation is usually limited to listening and occasional response to teacher questions.

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a number of other resources were used in the preparation of this report. the reader who is interested is referred to the bibliography in the appendix from the State Committee on Public Education position paper by John Goodlad, of the University of California at Los Angeles. Goodlad is probably the best informed of all the authors we have read, and he is working in California.

SECTION FOUR

APPLICATION OF CURRENT THINKING IN EDUCATIONAL INNOVATION TO THE EDUCATION OF CULTURALLY DEPRIVED PUPILS

PART FOUR

I think it is evident that innovative education for disadvantaged children requires a more fundamental re-orientation than that which is directed at the normative pupil. Certain aspects of school re-organisation, therefore, will have little immediate relevance to the ghetto child's problems. The concepts of more teacher-child flexibility, and more 'academic freedom' for both of them which underlie such innovations as the removal of grading and of schedules set the stage for a new educational approach. They might well be ineffective in a ghetto school where the children are not yet prepared to handle an unstructured and permissive environment. Their homes are often rigid and their behaviour there is strictly controlled.

Administrative reform in the ghetto school has for a long time been held up by the pedantic attitudes of the black administrators whose endeavours to make all-black schools 'as good as' all-white schools have overlooked practical solutions to problems. The principal of increased participation in and increased committment to administrative reform by both teachers and students might suggest an effective administrative approach for the black administrators. As far as the pupil is concerned, such participation would fit in with his early independance, his peer-group organisation, and his street-group heirarchy orientation out of school. Student teaching constitutes a furtherance of the same principle of participation; and as a recognised method of reducing the drop-out rate functions ideally for the ghetto environment.

Such technological innovations as are being developed are obviously highly applicable to ghetto schools: not only are the children more interested in mechanical and motor skills than in verbal and scholarly ones, but also there is a higher and more immediate reward value associated with machines than there is with reading and writing.

Television - bearing in mind its close connection with the ghetto home - is an obvious teaching method; and the culturally deprived child's pre-occupation with machines and 'colourful commodities' is an invitation to the Audio-Visual media. It is important that the material presented via these methods remain within the child's frame of reference and/or value system. If this is not the case, the medium itself runs the risk of becoming a toy and a joke.

A technological innovation that might be considered not to meet this criterion of relevance is that of the language laboratory. In the United States associations with Europe have acquired certain connotations of wealth, of upper-class culture. For Europeans, learning another country's language is necessary inasmuch as one expects with all certainty to use it in the country. For Americans, learning another country's language constitutes a sort of cultural polish inasmuch as one's use of it in the country pre-supposes the luxury of travelling there. For culturally deprived Americans, therefore, a European language is irrelevant. Given, however, that they have evolved their own expressions and that they function in their own language, it may be more valuable for them to learn standard American English.

Teaching machines and computers as aids to teaching and even as teacher surrogates bear rather more relation to the resolution of the teacher role than to the disadvantaged child. They are, however, central to the setting up of 'programmed learning', which would provide a means for the disadvantaged child to select what he wanted to learn and to gear it to his own pace of learning. It would also dispense in a large part with the teacher-pupil relationship in

the standard classroom sense - which has been a source of interference in the pupil's learning process - and would provide a more individual 'rapport' between them with the teacher able to devote more time to each student singly. Of all the implications of this redefinition and re-evaluation of the teacher role, the most vital for the culturally deprived pupil lie in his teacher's opinion of him. A team teaching project oriented to a ghetto school with racially mixed teachers acting as controls and reinforcements of each other's conduct could effectively provide an antidote to 'the self-fulfilling prophecy'. The training of teachers ought to provide specialised information or orientation programmes for those considering working with disadvantaged children. An alternative to such programmes could probably be provided by 'teacher aide' programmes, which would fulfill the double functions of supplying teacher aides to the schools and of supplying first-hand experience to future teachers. There is a nation-wide use of this practice in France - where the aide is called 'surveillant' - although it is somewhat unsystemized.

Some of the curricular innovations should prove a help to the struggling teacher in the ghetto at the moment, who has to devote so much of his time to disciplinary control. New modes of presentation of 'difficult' subject are open to adaptation to a ghetto school curriculum. There is increasing emphasis on the individual child - such as 'discovery learning' and 'independant study' - and a corresponding increase in his opportunities to study what he wants to learn. He is then enabled to become involved in and creative about what he is doing. This sounds ideal; but for a child from the ghetto it may have less validity.

I would surmise that the open street life provides a fair measure of 'creative participation' that is not available to the middle class chid's more cloistered environment. There is the danger of reducing the curriculum to a level where the child will learn no more in school than he learns outside, no longer becuase the two environments are too different, but becuase the child is unable and unimpelled to differentiate between them. It must not be forgotten that whatever the values of ghetto culture, one is educating a child to function in the middle-class world.

SECTION FIVE

ARCHITECTURAL CONSEQUENCES OF EDUCATIONALLY INNOVATIVE SCHOOLS

The first thing most educators complain about when they are trying to implement innovative educational programs is the egg-crate lay-out of most existing school facilities. The long corridor with identical spaces set up for classes of abbut thirty pupils each and a single teacher are not adaptable to the needs of a school involved in innovation.

CLASSROOM SIZE

Since new educational programs have students working in numbers from one up to ninety or a hundred, class size must respond to these variations. Efficient use of space requires flexibility in class size. The implication is that a single space must be capable of either accommodating variable class sizes or of changing its size in order to make the necessary accommodation. Standard school designs do not usually consider the possibility of a number of groups in a single room, so they are not designed acoustically for such an arrangement.

The installation of carpets has been found to be an effective way of giving flexibility to an existing classroom space. All new class spaces should include carpets. But carpets alone are not the answer, even if they do provide a relatively effective and efficient means of converting old classrooms to meet new needs. New classrooms must be provided with greater built-in flexibility.

Optimal flexibility can come only when the wall configurations can be changed easily and without cnages in lighting, heating or venti-

lating systems. Even more important, the structural system should be independent of the movable walls.

Adequate sound reduction can eliminate the need for many walls, but not all of them. Certain class activities require visual isolation which only walls can provide.

WALLS

Technological advances provide us with the materials with which to cover schools' walls and meet both educational needs and the problems of facility maintenance. The ideal wall covering should allow itself to be written on and erased in a variety of medium. Users should be able to tack things to the walls without damage to the wall surfaces. Interchangeable small wall cover panels can be made in such a way that the students and teachers can manipulate thme to their own liking. This gives the user the opportunity to participate in the determination of the nature of at least the details of his enviornment. Such an opportunity geneeally results in an increased interest in the environment and better maintenance.

Above all, the wall should be movable. Classroom size should not be fixed, and the classroom users should have the opportunity to rearrange the walls frequently. A lightweight wall is more mobile than a heavier one, but it is a poorer sound reducer. This another reason why the floors should help in the sound reduction task and releive the walls of one of their traditional tasks.

FLOORS

Carpeted schools are not only better schools but they are cheaper. The maintenance costs of carpeted schools (indoor-outdoor carpets) are five-eighths the costs of maintaining traditionally floored schools. The reduction in costs of maintenance quickly pays the difference in costs of floor coverings. In a new schools the installation of carpets instead of a traditional floor finish will cut even father the relative costs. No new school should contain classrooms without carpets.

Furthermore, in the primary school age especially, children enjoy sitting on the floor, and carpeted floors are certainly more conducive to this activity.

FURNITURE

The rows of desks in fixed posts are not to be found in the new schools. As indicated above, the students will be using the classrooms in new and constantly varying numbers. Furthermore, many of their new activities will allow them to sit on the floor instead of sitting behind the sterile and oppressive schools desks found in traditional schools. Some rooms in the new schools may have no furniture at all, others may have large low tables, while others may have more traditional kinds of classroom furniture.

Computers, television sets, learning machines, and typewriters are just a few of the standard pieces of furniture to be found in the new schools. The traditional blackboard may be repalced with audio-visual equipment which makes the blackboard a relic of the past.

CLUSTERS

With the onslaught of electronic teaching aids and other products of the introduction of technological advances into the classroom, it is becoming increasingly popular to arrange classrooms in clusters around concentrations of specialized equipment. The cluster concept coupled with the classroom size and configuration flexibility concept again argue for the use of flexible wall systems. A cluster might include from four to eight principle spaces plus auxiliary spaces for individual student or teacher preparation. Such clusters can be free-standing, connected linearly with other clusters, or stacked and connected in a variety of ways.

GENERAL REMARKS

The most interesting project to date in the field of school design is that of the Educational Facilities Laboratory sponsored SCSD Project. The Schools Construction Systems Development Project was conducted in Palo Alto. The goal of the project was develop an economically feasible school construction system which responded to the demands of flexibility which have been mentioned above. It is interesting to note that the SCSD schools that have been built to date in California have cost about the same (sometimes less) per square foot) than the conventional schools constructions in California. The advantages of the SCSD schools are that they are air conditioned and flexible while standard constructions are neither of these. EFL has published a report on the project, available upon request without charge. No other work in the school construction field has done so much to enable

architects to design schools which meet the challenges of current educational trends and the demand for more quality in our educational systems. The system has been constructed by many schools all over the United States, and points the way for other projects in the field.

APPENDICES

This section is meant to provide a general picture of the kinds of things which are going on in some of the forward-looking schools and school programs in the United States. The system of organizing these trends is not rigid or standardized, so we have developed the following list;

1. SCHOOL ORGANIZATION
   a. Non - grading
   b. Administrative reform
   c. Non-schedule
2. COMMUNICATIONS TECHNOLOGY
   a. Educational Television (ETV)
   b. Computers
   d. Audio-visual equipment (A-V)
   e. Filmed courses
   f. Teaching machines
3. CURRICULUM
   a. Early presentation of "difficult subjects"
   b. Adaptation to individual child
   c. Integration of concepts
   f. Programmed learning
4. TEACHING
   a. Team teaching
   b. Teacher aids
   c. Teacher training
   e. Evaluation techniques
   f. Master teachers

g. Specialists

h. Student participation

5. LEARNING

a. Independent study

b. Discovery learning, active involvement

c. Pre-school education

d. Unlimited learning

e. Intrinsic motivation, participative-creative activity

f. Groups for learning (role playing, forums, games, etc.)

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