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Rural Renaissance

REVITALIZING SMALL HIGH SCHOOLS

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
ABRAHAM A. RIBICOFF
Secretary
Office of Education
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Acting Commissioner

Foreword

SOCIETY'S RESPONSIBILITY in the 1960's is no less for the youth in our small high schools than for those in our large comprehensive high schools. A sound education, commensurate with ability, is the heritage of all.

The extremely small high school is necessarily limited in its educational offerings. While the school reorganization movement has advanced significantly since World War II in combining small school districts, the number of extremely small high schools remains proportionately great. During the school year of 1958–59, over 8,000 of the Nation's 19,000 high schools enrolled fewer than 200 students.

In such small schools—particularly those in relatively isolated areas with little chance of becoming larger—what can be done to improve instruction? The story of the experiments conducted in some of them in order to bring about such improvement is the basis of this study. The results of these experiments will not be available for some time, but such results will bear a close look.

Increasingly, our progress in many educational areas is being determined by the findings of research. Progress in improving the small high school is certainly no exception. Other types of elementary and secondary schools, specifically larger high schools, may also benefit from much of the research in progress and that which is projected as described in these pages.

The Office of Education appreciates the time and efforts contributed to this study by personnel of the Catskill Area Project in Small School Design, the Rocky Mountain Area Project for Small High Schools, the Midwest Program on Airborne Television Instruction, the Educational Facilities Laboratories, Inc., and the Ford Foundation. The use of the excellent photographs, in particular, was possible only through their generosity.

J. DAN HULL
Director
Instruction, Organization, and Services Branch

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Division of State and Local School Systems

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Page 19.—Ford Foundation (classroom in Snyder, Tex.).

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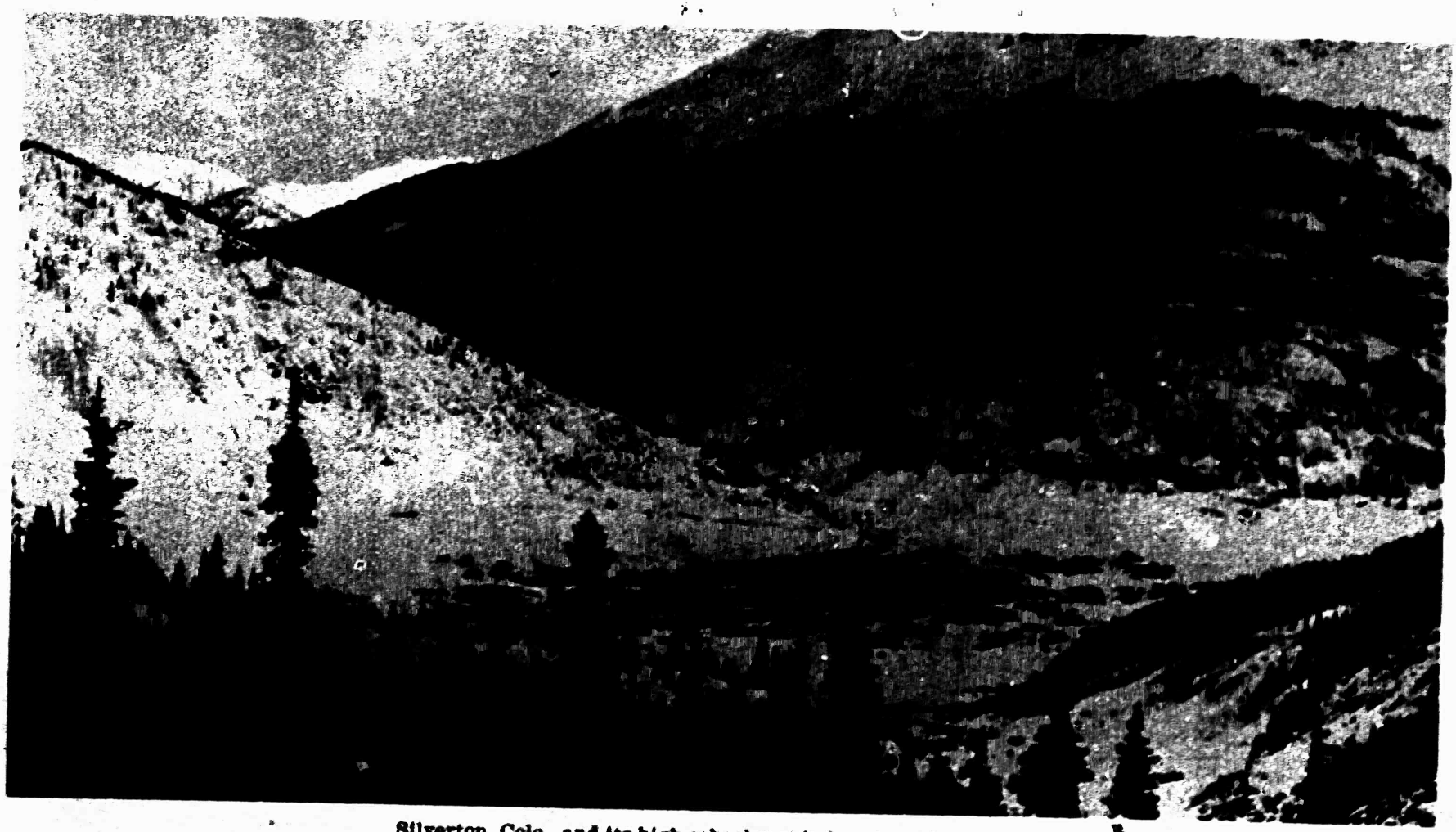

Silverton, Colo., and its high school rest in beauty and isolation.

Introduction

DEFINITION: "revolutionize, *v.t.* . . . 3. To change completely." This is the story of some promising developments which could conceivably revolutionize the instructional programs of our small rural high schools. Some of these developments are so new that they are in the experimental stage; others are quite old and of demonstrated soundness but have simply never "caught on." Many of these developments have significant implications for our secondary schools of all sizes in all locations, and some of them, where appropriately modified, have significance for other educational institutions serving other age levels.

All of these developments are at this moment being tried experimentally in some public high school. Indisputable conclusions as to the success or failure of such developments may not be known for several years; in fact, evaluative criteria are admittedly not yet firmly established, while control groups have been too often lacking; but the empirical evidence would seem to indicate that there are many developments here of promise both to the future experimenter and the present practitioner in our schools.

We have known for some time beyond any reasonable doubt that we will continue to have for many years several thousand small high schools enrolling several million of our young people annually. Furthermore, we have evidence that far too often the young people in such schools unfortunately have not received a comparable education to that of their peers in larger schools.

How can their education be improved? There is no single answer to this question, but most suggested answers relate to the need for further school district reorganization. Excellent progress has been made in this regard, but we still have over 35,000 operating school districts in our 50 States. The realignment and combining of these districts depend on the local voting citizens, and it is a responsibility that must be met.

Are the current systematic movements to improve small high schools in opposition to the school district reorganization movement? The answer is an unqualified *no*. They are simply designed to offer

assistance *now* to all small high schools and to offer future assistance to the high schools which will remain relatively small before or after reorganization plans are effected.

Dr. Elbie Gann, Assistant Commissioner for the Colorado State Department of Education, has coined a phrase which aptly describes the schools under consideration. He refers to them as the "necessarily existent" small high schools which should be improved because of their smallness—not in spite of it. Dr. Gann and all others concerned with this problem recognize that the school district reorganization movement has eliminated, fortunately, thousands of "unnecessarily existent" small school districts, and it will continue to combine many more of them into larger operating units. However, many high schools will remain small after all possible reorganization has been effected, while others will exist for an indefinite period prior to reorganization.

These schools need and deserve help.

It is impossible to define precisely the "small high school." Nevertheless, the attempt must be made with the understanding that a "gray" area exists here between the large and the small. There is general consensus among the experts that any high school, regardless of its organization, which enrolls fewer than 200 pupils is *small*. It would usually enroll fewer than 40 in the senior class. The factor of relative geographical isolation, however, is a vital one in this respect and must also be given proper consideration. Within this context a suburban school enrolling 190 might not be as "small" as an isolated school enrolling 250 in a relatively remote region of our Nation.

We use the figure 200 merely because it is safe to say that all high schools below this figure are certainly quite small and that most of them are in dire need of assistance. It must, of course, be noted that many schools enrolling somewhat more than 200 may be considered "too small" by some, but our concern here is with the small, relatively isolated high school, and this is our delimitation.

The latest available statistics for 1958–59 indicate there were 8,084 small schools (as we have delimited the term) and that they had enrolled in them 1,650,000 pupils. It is a matter of conjecture how much these figures will be reduced in the next 10 years, but there is considerable doubt that the reduction will be a truly significant one. In any event the current figures are rather formidable ones when it is recognized that these represent 42 percent of all our 19,191 high schools (excluding junior high schools) and 20 percent of the 8¼ million young people enrolled in our high schools.

Here, then, is the story of the first modifications to have been brought about in recent years which involve broad experimentations designed to improve the instructional programs of small high schools.

With minor exceptions such experiments are concerned wholly with administrative techniques—the means—for making possible the end result of more effective learning. What is to be learned—or course content—is the supreme challenge yet to be met. Perhaps this study can contribute directly to identification of improved means and indirectly to a successful meeting of the challenge ahead.

Extensive references are made throughout this study to the Catskill Area Project in Small School Design (CAP) and the Rocky Mountain Area Project for Small High Schools (RMAP). These two projects have much in common and constitute the broadest and most intensive series of organized experiments designed to improve small high schools that we have ever known. Both projects are composed of many cooperating school districts which began their fourth and final experimental school year of operations in September 1960.

The organizational structure and operational plan of the projects differ considerably, but each project has received major financial support from the Ford Foundation's Fund for the Advancement of Education. For detailed information beyond that presented in this study contact:

Ralph G. Bohrson, Director
RMAP
State Department of Education
Denver 2, Colo.

and

James J. Sampson, Coordinator
CAP
215 Home Economics Building
State University College of Education
Oneonta, N. Y.

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Promising Experimentation

AS WE ENTER the decade of the sixties carrying with us the same unsolved educational problems of too many students, too few teachers, inadequate facilities, and a pressing need for curricular revision, our educators are aware as never before that there is no panacea button waiting to be pushed—no single remedy waiting to be found which will solve any one or any group of these most vexing problems. The surest gains in the direction of eventual solutions will come about only through sound research and through experimental testing, in school settings, of promising hypotheses.

The results of such experiments currently and in the years ahead need wider immediate publicity than they have received in the past. This seems particularly important for our small high schools so often located in relatively isolated, rural settings. There, the typical educational problems mentioned above, with the exception of "too many students" are more acute than in urban communities. The problems affecting rural schools are interlocked, and improvement in any one area will assist in solving problems in the other areas.

Technological Communications

The advance of technological developments and their accompanying experimental applications to education need to be watched closely by those leaders responsible for improving our small high schools. It is in such schools that the acute shortage of teachers and the sharp limitation on possible course offerings in the curriculum defy direct solution. Indirectly, the educational implications of advancements in technological communications offer much promise. Specifically, the promise rests in the area of stored knowledge.

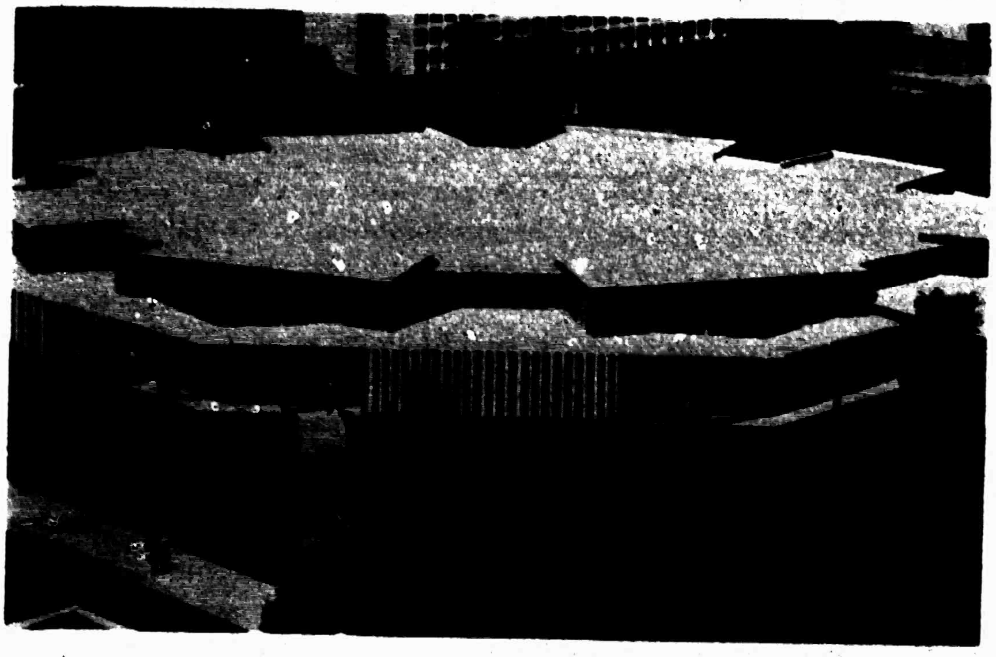
In a "necessarily existent" small high school lacking sufficient teachers and appropriate advanced courses, the use of stored knowledge which could be transmitted electronically would have obvious advantages. Certain basic and elementary presentations of information would need to be prepared but once and recorded electronically for repeated use; advanced lessons to be used by gifted students could be similarly recorded; and other materials recorded by outside agencies on video tape, film, audio tape, and automated self-teaching devices could be further utilized.

Under such circumstances, maximum use could be made of the valuable time of the available professional teachers, and specialized advanced-learning courses would be available to those students who need them. If the current experimentation proves the feasibility of such plans, greater job satisfaction on the part of the teacher should result, and at the same time, more able young people would be attracted to the teaching profession.

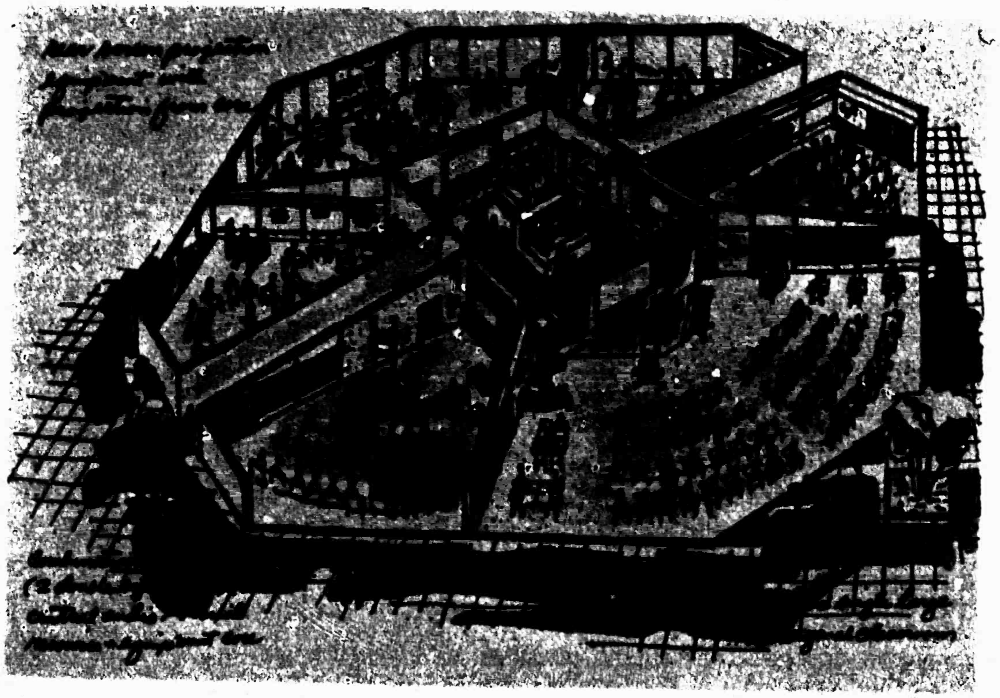
How could such plans be implemented? Educators, engineers, and technicians have simultaneously conducted certain necessary research in this area in a variety of laboratory settings throughout the Nation. They are talking increasingly of a master control schoolroom containing an "electronic bank." Here would be "stored" in a completely new sense (electronically) the video and audio tapes, films, teaching machine programs, all necessary transmittal and receiving equipment, and other familiar audiovisual equipment already in general use. A new type of school employee, an educator trained in special technical competencies, would be in charge of the bank.

In a building constructed on this premise, the entire school would be geared to this master room, the "nerve center" for electronic operations. Scheduling and programming would be matters of top priority in making full utilization of these educational tools. Each room would be in effect a complete receiving studio attached to the master room, and the only limitation on the use of electronic devices would be the imagination of the teacher. This must seem radical, indeed, to a teacher who may be required to order in April a short film to be shown at 2 o'clock on February 12 of the following year.

Students in large groups, small groups, or individually—and possibly in one "room"—would benefit from such advanced technological communications. Through the use of flexible partitioning, the physical limits of this "room" could be quickly changed at any time to satisfy a particular need, for this new concept does not include the traditional rectangular classroom with its stationary walls. (See sketch of school building unit on page 7.)



The plan of an octagonal-shaped building in which maximum use will be made of the many mechanical and electronic aids to education. Sixteen classrooms of different sizes will ring a "bank" equipped for TV, slides, films, tapes, and projected writing. The instructor, at the touch of a button, will be able to bring any one of these into his classroom. Robert Fitch Smith, Architect.



Sketch of a school building unit showing one of the possible partitioning arrangements.

An alternate plan for a group of quite small schools in a given locality might involve a mobile electronics center. (Such a mobile center could also augment the program of a group of schools in the process of developing their own master rooms.) All electronic devices could be constructed in a compartment on a truck which could move from school to school. Certain limitations are obvious, but the sharing of expenses by several schools would be an attractive feature, and a moble center could play an especially vital role in the transition stage of moving from the status quo to electronic banks.

Certain existing buildings might be remodeled slightly in order to experiment with the possibilities of an electronics center. A central classroom could be converted into such a center, but the advantages of flexibility would be limited. The scheduling problem would be particularly acute as classes or certain groups of students would have to be rotated in order to make use of the central studio. Certain other devices could be installed in many of the existing classrooms, but this would probably be too costly to be considered generally.

Here, then, are three alternatives for setting up an electronics center to serve a school. Decisions would have to be made by informed laymen, teachers, and administrators as to what electronic tools should be included in such a center. What *precise use* could be effectively made of *each* tool in *each* of the subject areas? The answer to this question provides the key to any planning program for the use of any specific electronic device.

TV viewers of the 1960 political conventions witnessed an excellent example of the use of the "electronic bank." While an important session on the convention floor was receiving "live" coverage, three equally important newsworthy group meetings, simultaneously in progress, were videotaped by three separate camera crews. The video tapes were then stored in the "bank" in the network control room for future selective use. Moments later, or hours later, when the convention floor activities were of less immediate interest, one or more of the three group meetings, recorded earlier on video tape, were selected and shown to the Nation's 122 million viewers.

There would seem to be significant implications for education in this commerical prototype. Moreover, the entire field of technological communications is advancing with such speed that each development will have to be given close scrutiny. We have sufficient evidence now that this area of technology does not constitute a 21st century dream. Rather, the technological know-how, undergoing constant refinement, is here: the primary task is to determine its specific uses in our schools.

If uses are found, what would be the cost? It is far too early to determine ultimate costs for the mass production of such communication facilities, but the relationship between costs for buildings and for facilities is a pertinent factor. Dr. Harold M. Clark, noted economist at Teachers College, Columbia University, has studied intensively the vital factor of school building costs. He found that in the building programs for both industry and schools at the beginning of this century, 75 percent of the total capital outlay was spent on buildings while 25 percent was expended for facilities and equipment in the buildings.

In 1960 the percentages for industry were exactly reversed, while the percentages for schools remained essentially as they were 60 years ago.

The related school problems of buildings, facilities, and costs are given detailed treatment in two new publications by the Educational Facilities Laboratories:

The Cost of a Schoolhouse
and
Design for ETV: Planning for Schools with Television.

Copies may be obtained without charge by writing:
Educational Facilities Laboratories
477 Madison Avenue
New York 22, N.Y.

A single set of figures projected by one serious but imaginative educator in this area of technology serves to highlight the implications of such possible changes. His estimate is that *each* student in such a proposed school of the future would spend one-half of his time in school securing information through technological communications. This would approximate 500 hours per school year per student.

A final sobering thought should be given to all those interested in advancing the quality of instruction in small high schools. Large schools are moving rapidly now toward the utilization of technological communications. The admitted existing gap between the quality of instruction in large and small schools could thus be widened rapidly, and if the small schools should not move forward at all in electronic developments, the gap might become a chasm that might result in the abandonment by the public of most small high schools.

Where do we currently stand in the development and use of these new devices? No more than exploratory work has been begun in the development of such electronic facilities as those which would compose the bank of a master control room. In fact, video tapes for

internal school use and the equipment to make their use possible are virtually nonexistent.

On the other hand, the development of relatively crude, mechanical teaching machines is underway; the best use of television is continuously being explored under all conditions; complete courses on film and other types of filmed programs look promising; and the use of magnetic audio tape has, after a considerable delay, reached the school in impressive proportions. Let us examine each of these developments.

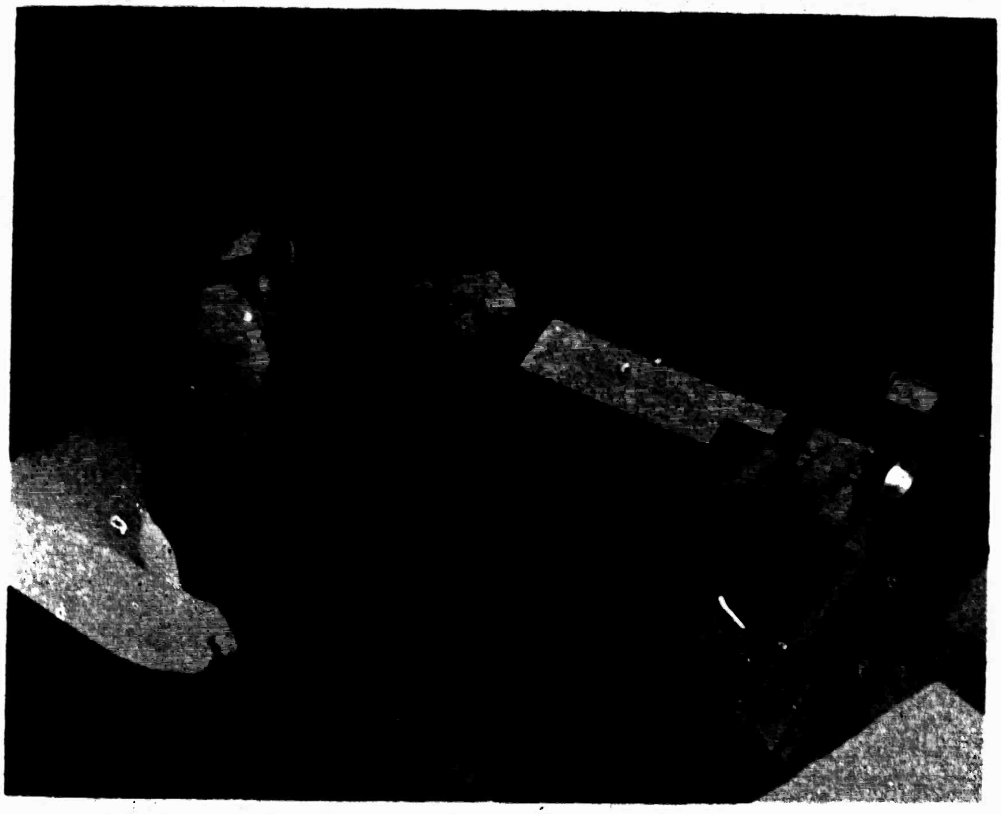
Teaching Machines

The Rationale

Teaching machines involve such radically new concepts and procedures that exploration is still in its early stages, and even the general nomenclature used to describe the machines or the process is subject to controversy. "Teaching machines" seems to be the term gaining most acceptance, but others currently in use are: "educational automation," "learning machines," "programmed self instruction," "programmed teaching materials," and "automated teaching devices." One's preference among these terms (not all of them synonymous) depends largely upon the semantics of the phrases: still other terms will undoubtedly be introduced in this area.

Nevertheless, it is clear that here is a new method of learning built on the premise that self-instruction can proceed, with or without a teacher, through the use of a programmed text or a programmed machine which is operated manually. (Electronic machines hold tremendous potential, according to the experimenters, but are still in the planning stage. The prototypes will undoubtedly be quite costly.) The premise, however, must be qualified: this method is a sound process for imparting knowledge and stimulating individual thinking *only* in those subject areas such as mathematics, languages, and the sciences, where there is general agreement on exact answers in skill learnings. Claims in other learnings, it must be noted, are not generally advanced.

Contemporary self-instruction techniques have their roots in studies first explored by experimental psychologists at least 45 years ago. From an idea conceived in 1915, the noted educational psychologist, Sidney L. Pressey, reported on his "machine" in an obscure article, "A Simple Apparatus Which Gives Tests and Scores,



A student operates a mechanical teaching machine. ". . . the learner proceeds at his own rate . . ."

and Teaches," in the March 20, 1926 issue of *School and Society*. After a long period of dormancy the idea was very recently reintroduced and is being nourished by another noted psychologist, B. F. Skinner. After mechanizing the training of an imbecile white rat, Professor Skinner theorized that mechanized learning for human beings should be possible. Some 80 experimental reports have been announced by other researchers in the last two years. Such studies have assumed that certain objective learnings take place most effectively in a "tutorial system." Other learnings take place best, of course, in small group and large group situations.

A further premise of the teaching machine exponents is that even in the area of objective learnings we have had to rely on group situations simply because we have had far more students than tutors. This has posed serious problems of inefficiency in the teaching-learning process, since we have tended to teach whole groups at the learning rate of the average student. This has resulted too often in failing to teach the slower learners, while holding back, simultaneously, the gifted group.

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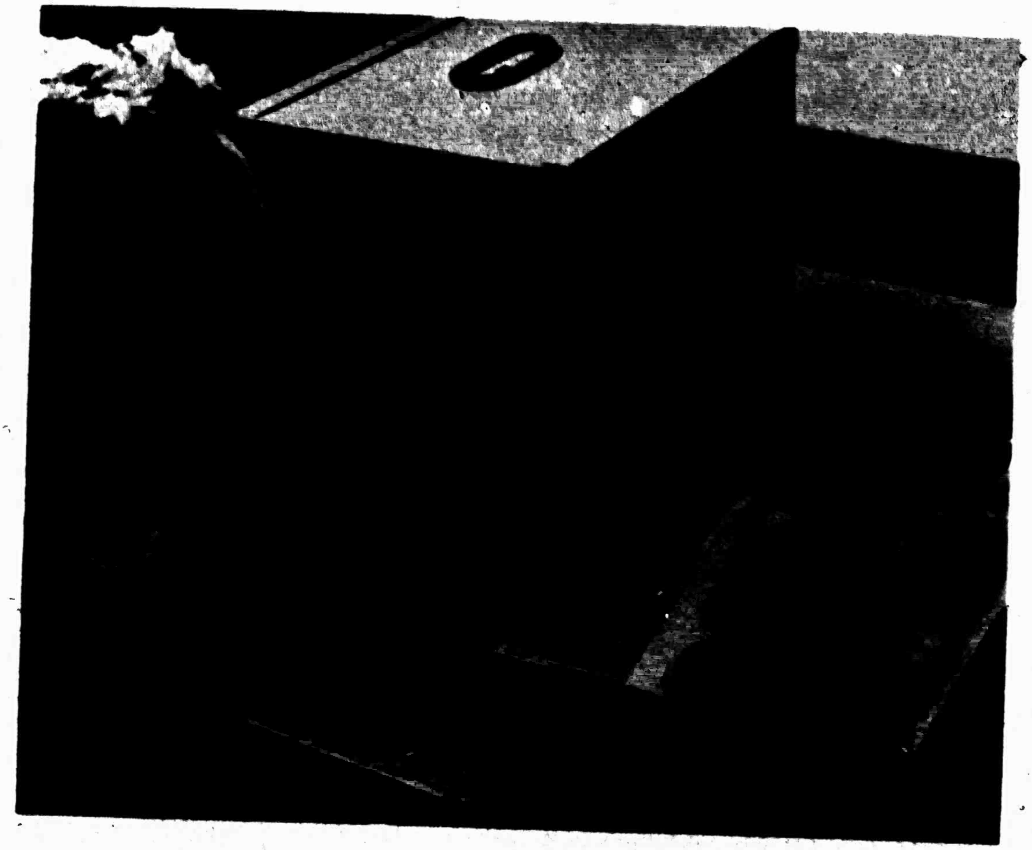
In areas of objective learnings, therefore, we find a return to the tutorial system with a "tutor" (the machine or programmed textbook), for each student. The assumption is that each student proceeds *at his own best learning rate* in the delicate process of teaching himself, using a carefully controlled technique in the development of which a trained psychologist, a subject matter specialist, and trained programmers have pooled their skills. A logical, systematic and psychologically sound lesson is thus produced.

The theoretical procedure is to present the lesson in small steps (the Socratic teaching procedure basically) giving the learner immediate knowledge of results—i.e., the psychologist's "reinforcement" for a correct response or the correction of the erroneous response. Working independently of other students, the learner proceeds at his own rate with the teaching machine or the programmed textbook.

The potential educational advantages of a programmed method of learning were recently summarized by Donald E. P. Smith in the *Michigan Education Journal* of March 1960:



"Every student is continuously involved with a task . . ."

Many values of programmed learning have been claimed. The following appear to be the most important and the most defensible:

1. Every student is continuously involved with the task, a condition seldom obtained in the classroom.
2. Learning is completely self-paced; the learner can proceed as slowly or as rapidly as his ability requires.
3. Motivation to learn becomes very great as a result of the continued success built into the program.
4. The teacher is relieved of the responsibility for insuring routine learning, thus leaving time for the development of creative and critical thinking skills.

The construction of a sequence of learning steps which the student follows constitutes the teaching machine program. This is at the heart of the entire concept.

Such a program would be a work of art as well as a science and would be based on complete knowledge of a subject. Few experts currently exist with the requisite skill and knowledge. Nevertheless, the development of such experts is being emphasized, for the future of the teaching machine method may fundamentally rest on the development of this new educational species—the program specialist.

The Reality

While the implications of the research and experimentation in the teaching machine field of programmed and automated self-instruction have been impressive, there has until recently been a complete lack of trial in the classrooms on any significant scale. For a listing of the research and speculation on this controversial subject, consult:

Teaching Machines and Programmed Learning, Department of Audio Visual Instruction, National Education Association, Washington, D.C. A. A. Lumsdaine and R. Glaser, editors. 1960

"Teaching Machines: An Annotated Bibliography"
Audio-Visual Communication Review (Supplement I), Vol. 8, No. 2, 1960
Edward B. Fry and others.

However, on February 1, 1960, the Roanoke, Virginia, public schools began an experiment in teaching elementary algebra through the use of teaching machines. For an entire semester, 34 typical eighth grade pupils—each working with his individual machine and with a teacher supervising the group but giving no help—attempted to teach themselves beginning algebra. The experimenters state that the year-long course (usually offered in the ninth grade) was completed by the eighth graders in one semester or half the usual time.

It is further stated that a majority of the students showed an "excellent grasp" of the subject as indicated by results of standard achievement tests. No lectures, classroom demonstrations, textbooks, or homework were used.

These claims are certainly astounding.

During the past year there was no intention of conducting a controlled experiment but merely of determining whether or not algebra could be taught solely by a teaching machine. First results seem to indicate that it can.

For the school year 1960–61 experimental control groups are being established in Roanoke, as the project is continued under the sponsorship of Encyclopaedia Britannica Films and a grant from the Carnegie Foundation in cooperation with Dr. Allen Calvin of Hollins College. Elementary and intermediate algebra and plane geometry each are being taught to three groups on a controlled basis: for example, one math group uses a programmed textbook and no help; a second math group uses conventional materials with a teacher only; and a third math group uses a combination of the teacher and the programmed textbook. The same teacher (acting only as a monitor for the first group) is being used with each of the math groups.

Future plans for experimentation in this one project call for the adaptation of materials to teaching machines and programmed textbooks and further actual classroom trial of these devices for the following subjects: solid and analytical geometry; trigonometry; and two academic years of instruction in each of four languages—French, Spanish, German, and English. (A tentative research finding from another source indicates that the grammar of a language may be learned best on teaching machines, while the speaking of a language may be learned more effectively from tapes.)

Such developments could have significant implications for the Nation's small high schools. Present plans of this project indicate that these programmed materials will be available in September 1961. One commercial firm anticipates it will be able to deliver an entire "packaged" year's course to the student at a total cost of about $10.

For information concerning these projects write:

Dr. John R. Everett, Chancellor
New York City's Institutions of Higher Learning
New York, New York

or

Dr. E. W. Rushton
Superintendent of Schools
Roanoke, Virginia

It will be important also to watch for announcements from other research projects underway on various teaching machines at Earlham College, Hamilton College, Harvard, Illinois, Indiana, and Arizona State Universities. There is also a newly-founded *Automated Teaching Bulletin* available in libraries.

Midwest Program on Airborne Television Instruction (MPATI)—The Rationale

This specific project utilizing educational television will begin experimentally sometime in the spring of 1961, when educational courses on video tape will be telecast from an airplane flying at high altitude over north-central Indiana. By elevating the transmitter a few miles above the earth, its geographic coverage will be greatly expanded beyond the limits of a ground-based transmitter. Thus, it will be of benefit in particular to schools in small towns and rural areas. The telecast will be received on TV sets in the classrooms of some 100 area school systems which have elected to participate in the initial experiment for three hours per day, four days per week. The course offerings will be composed of subjects for elementary schools, secondary schools and colleges.

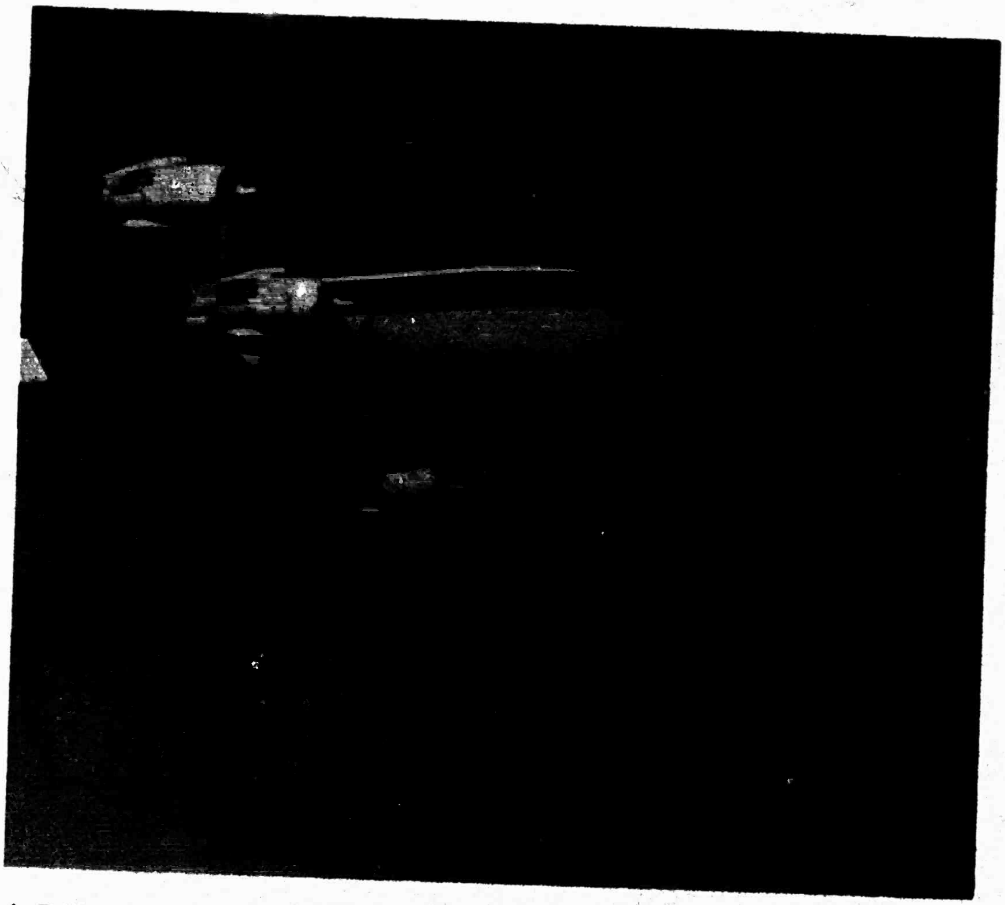
A full academic year of telecasts will then begin on September 11, 1961 and continue until May 24, 1962. A potential audience or class of 5,000,000 students in 13,000 schools is involved.

These are the plans in brief for MPATI.

Even though the first staff members did not arrive at Purdue University headquarters to begin work on this massive educational experiment until the autumn of 1959, misunderstandings by the public as to the basic plans of MPATI are already legion and classic: someone wondered whether there was enough subject matter in "airborne education" to justify so many courses on it; another was concerned lest regular classes at Purdue be upset by that airplane circling round and round each day; and still another worrier was concerned for the teacher in that airplane trying to do fractions at the blackboard in that heavy parachute.

The courses will be mathematics, music, history and similar subjects, with the only direct relationship to "airborne education" being the airborne TV transmitter equipment in the plane; Purdue students will scarcely be disturbed by the DC6AB which will fly at an assigned altitude of 23,000 feet in a circle of 10 miles radius, with the community of Montpelier, Indiana, as the approximate center. The teachers who will be seen on hundreds of televised lessons will have been videotaped in comfortable modern studios long before the first flight is made. A glance at the curriculum planned for 1961–62 reveals the range of courses which will be telecast.

In addition to the current and future doubts in some quarters as to the possibilities and potentialities of such a revolutionary approach to education, misunderstandings will probably continue. But we shall all be in a better position to evaluate the program tentatively in the summer of 1961, and by the summer of 1962, the strengths and weaknesses of such a program should be quite clear.



A DC6AB in flight employs a 30-foot sending antenna to beam instructional courses into midwestern schools.

It is far too early to hazard predictions of success or failure; however, that this is a serious endeavor sponsored and performed by a group of diligent and dedicated educators with broad experience, there can be no doubt.

Curriculum of Courses Planned for the MPATI 1961–62

	Days per week	Length of class (minutes)
Elementary Level		
*Elementary Science, Grades 3–4	4	20
*Elementary Science, Grades 5–6	4	20
Elem. Social Studies, Grades 3–4	4	20
Elem. Social Studies, Grades 5–6	4	20
*Arithmetic, Grade 6	4	20
Arithmetic for gifted Elem. Children	4	20
Language Arts, Grades 3–4	4	20
Language Arts, Grades 5–6	4	20
Beginning Spanish, Grades 3–6	4	20
Spanish for Elem. Teachers	1	15
*Beginning French, Grades 3–6	4	20
French for Elem. Teachers	1	15
*Art, Grades 1–3	2	20
*Art, Grades 4–6	2	20
*Music, Grades 1–3	2	20
*Music, Grades 4–6	2	20
Secondary Level		
General Science for Junior Hi	4	30
*Physics for Senior Hi	4	30
Biology for Senior Hi (AIBS Films)	4	30
*American History for Senior Hi	4	30
*World History and Geography	4	30
*American Government and Civics	4	30
Beginning Spanish for Junior Hi	4	30
*Amer. Literature and Composition	4	30
Guidance for Junior and Senior Hi	1	30
College Level		
Mathematics (Continental Classroom—Film)	5	30
*Chemistry (Continental Classroom—Film)	5	30
College Russian	4	30

	Hours per week	Percent
Elementary offerings	16½ =	41.25
Secondary offerings	16½ =	41.25
College offerings	7 =	17.50
Total	40 =	100.00

*The courses starred above are tentatively planned for telecast during the demonstration period ending May 26, 1961.

It is not our purpose here to discuss the merits and drawbacks in general of educational TV as a method of instruction or tool. It is too broad a field to be treated here, and our focus is on just one facet of it. The question everywhere coming more to the fore today is, "How can we best use TV in our schools?" not "Should we or should we not use TV in our schools?"

Experiments in educational TV are continuing on a rather massive scale. For example, we note that the U.S. Commissioner of Education, under the provisions of the National Defense Education Act of 1958, has made 115 separate grants for various experimentations in educational media of which 42 deal specifically with educational TV.

One of the most promising features of educational TV through MPATI is its design for the small high schools of the Midwest. Here is an opportunity to bring instruction via TV to even the most isolated school. In fact, the experiment is considered to be a pilot project for similar regional projects in other sections of the country. It has even been suggested that eventually a relatively small number of aircraft be used to provide coast-to-coast educational television coverage.

Meanwhile, MPATI will work immediately to establish and insure cooperation with educators and lay groups in the six-State region. A detailed plan for securing cooperation is now in effect. For example, two teacher-education courses related to elementary foreign languages are included in the programming, for it is recognized that most elementary schools will have no qualified teacher in this area.

At this point, it may be well to examine the nature of instructional TV. The following three patterns of instruction may be identified:

1. *Direct and total instruction*

   This is typified by the well-known Continental Classroom film series. Independent learning by mature students is possible with no teacher present other than the studio instructor. This presentation is least used in the public schools, and it is expected to remain so.

2. *Major resource*

   The course on video tape becomes the major method of presentation. The classroom teacher coordinates and arranges for secondary classroom activities with the students, but the primary responsibility rests with the studio teacher. A foreign language presentation for elementary schools would be an example.

3. *Supplementary instruction*

   The primary responsibility for instruction rests with the classroom teacher, while the studio teacher plans enrichment illustrations and presentations. An example would be a weekly tape in the personal guidance area.

"How can we best use TV?" The professional teacher finds a new tool to strengthen existing tested practices.

Most TV instruction in our elementary and secondary schools will fall between types 2 and 3.

It is consistently recognized and reiterated by the experimenters in TV that their efforts are predicated upon one important assumption for pre-college learning: TV is a new TOOL. TV can never replace classroom teachers; in fact, only among the uninitiated is such a thought ever voiced. It would be as foolhardy for educators to reject TV arbitrarily as it would be for them to assume that the moment of eliminating classroom teachers had arrived.

Educators in our small high schools should observe closely the results of MPATI in order to determine the extent to which it achieves its four stated purposes:

To broaden the *range* of educational offerings available to many schools.

To increase the *quality* of offerings in schools and colleges where resources are unavailable or inadequate at present.

To do these at a *cost* that is less than that for a comparable increase in quality achieved by other means.

> To conduct the *initial* program in a manner that will assist the development of a permanent facility for the long-range management and financing of the airborne instructional program by local and State educational authorities.

Thousands of professional workers will be involved directly in this program before even the maiden flight of the DC6AB. But it is evident that a tremendous burden of responsibility rested on the 18 talented and experienced classroom teachers who were selected from among several hundred teacher-applicants.

In a profession too often geared to parsimonious measures it should be heartening to teachers everywhere to find a $7 million investment which rests principally on the talents of 18 quite representative classroom teachers. (A $4.5 million appropriation from the Ford Foundation constitutes the principal contribution to this project.)

On one focal point in the profession of education today all divergent elements are repeatedly converging. That is the mutual desire to improve learning. We do not yet know what contribution, if any, MPATI will make in this direction, but Dr. Samuel Brownell, MPATI Chairman, Superintendent of Schools for Detroit and formerly U.S. Commissioner of Education, has summarized its intent in these words:

> Hundreds of important decisions have had to be made by hundreds of educators, technicians and others to bring us to even this stage of development. Despite relentless deadlines, however, quality has been the watchword.
>
> If all who read these words—and who are assisting or participating in this program in any way—will help us adhere to the highest standards, then the end product cannot help but emerge as a substantial contribution to the quality of education in American classrooms.

Results of neither this nor any experiment can ever be wholly anticipated, however. Consider for a moment the message written recently by a young boy in a TV course to the studio teacher he had never met, "You are the first teacher I've ever had who understood me."

Rather than representing an atypical observation by our new generation, this remark may become a minor classic in illustrating the many new forces which will shape educational theory and practice during the 1960's.

All letters of inquiry requesting materials on the technical and educational aspects of the program will be forwarded to the proper authorities if directed to:

Dr. Bryghte D. Godbold
MPATI Vice President
Memorial Center
Purdue University
Lafayette, Ind.

Filmed Courses

In a conscientious effort to take advantage of all available new devices in the area of technological communications many small high schools have tried out some of the new filmed courses. However, initial reactions are quite mixed and it seems far too early to determine the possible use of these courses in small schools.

Lack of adequate criteria for filmed courses is a serious drawback, but the same criteria can be applied to both filmed courses and TV courses on video tape. Because of the increasing development of thermoplastic and video tapes, the filmed courses may well become obsolete, but they certainly fill a present need during the developmental phase of this type of communications.

Of course, so many of these promising new practices are interrelated that it becomes difficult to examine any one in isolation. The team-teaching concept is essential to the effectiveness of either medium; filmed courses have been used in a multiple-class setting; teacher assistants have been used in presenting the films; and other devices such as teaching machines and tape recorders could also be utilized in relationship with the film.

Schools in both the Catskill Area Project (CAP) and the Rocky Mountain Area Project (RMAP) have used Dr. Harvey White's filmed series of 162 physics lessons and Dr. John Baxter's 160 chemistry lessons. These filmed courses, which formed the core of the Continental Classroom series released through commercial TV stations in recent years, were designed as college-level courses for college students and adults. Such advanced learning concepts as are presented in these films appear to be appropriate only for the most gifted high school science students. Nevertheless, such films help offset the meager laboratory equipment in many small high schools, and they often focus on recent discoveries that the local science teacher has been unable to introduce to his students. Teachers, of course, are not obliged to show all filmed lessons or even the selected ones in their entirety. Local course content would often be the determining factor.

Study guide materials for the students are obvious necessities, and the RMAP has developed some very excellent ones which they are

An advanced group of science students benefit from the Harvey White film series in physics.

making available to the CAP. Such an exchange of materials and ideas is a fundamental feature of the experiments being conducted in these widely separated schools of Colorado and New York. The development of filmed courses geared specifically for high school students—a development currently underway—is now awaited. A more meaningful evaluation of this medium in the instructional programs of our small high schools can then be made.

The planned experiments in the MPATI series may well help us to evaluate the full potential of this method of instructional presentation. Still, the problems of determining eventual costs and of justifying and meeting these costs will remain.

The need for the greatest rapport obtainable between the studio teacher and the thousands of classroom teachers using his lessons cannot be too strongly emphasized. The author had the opportunity of attending a recent RMAP workshop where Dr. John Baxter met formally and informally with the teachers for three days. Here was a talented, personable intellect furnishing proof of a dramatic new dimension in teaching. Dr. Baxter was busy every minute

giving direct suggestions for more effective teaching, but his mere presence provided a lasting and immeasurable contribution to the morale of these teachers from the rural Rockies.

We sometimes become obsessed with the need to measure everything in education by real or imagined objective means. The effect of Dr. Baxter's brief appearance in the lives of these teachers could not be measured by any possible instrument, but there was no question of the increased teaching effectiveness of those present who would "team" in the future with this master teacher to teach chemistry to our children.

Electronics

Audio Tapes

The deplorable lag in education between the development of something new and its eventual acceptance and use by the schools could be no more specifically illustrated than by the development of audio tapes. In spite of the overwhelming evidence in support of the use of tapes for more effective learning, the decade of the '50's had nearly ended before the breakthrough came about in schools.

With an encouraging sense of urgency, educators are "discovering" the value of this "new" tool, the tape recorder. In many a school the discovery has consisted of taking down the dust-covered recorder from the supply room shelf where it was placed several years ago when the novelty of it wore off. It was too frequently viewed in those days as a clever gadget whereby you could laugh at the sound of your own voice. Many teachers of music, speech, foreign languages and certain other subjects saw the full potential of tapes even then, but their efforts were too often carried on in a vacuum.

This picture was changed swiftly by the passage of the NDEA and the attendant installation almost overnight of language laboratories in hundreds of our schools. With funds available from the Federal Government these laboratories, which consist basically of tape recorders in various arrangements, now form a well-publicized chapter of current educational methodology.

Their use is now being adapted to fields other than foreign languages, and some of these adaptations in the small high schools comprising the CAP and RMAP are quite ingenious. Undoubtedly, similar but unpublicized experimentation is currently underway in many schools, for the opportunities awaiting inventive teachers and students in the use of tapes appear limitless.

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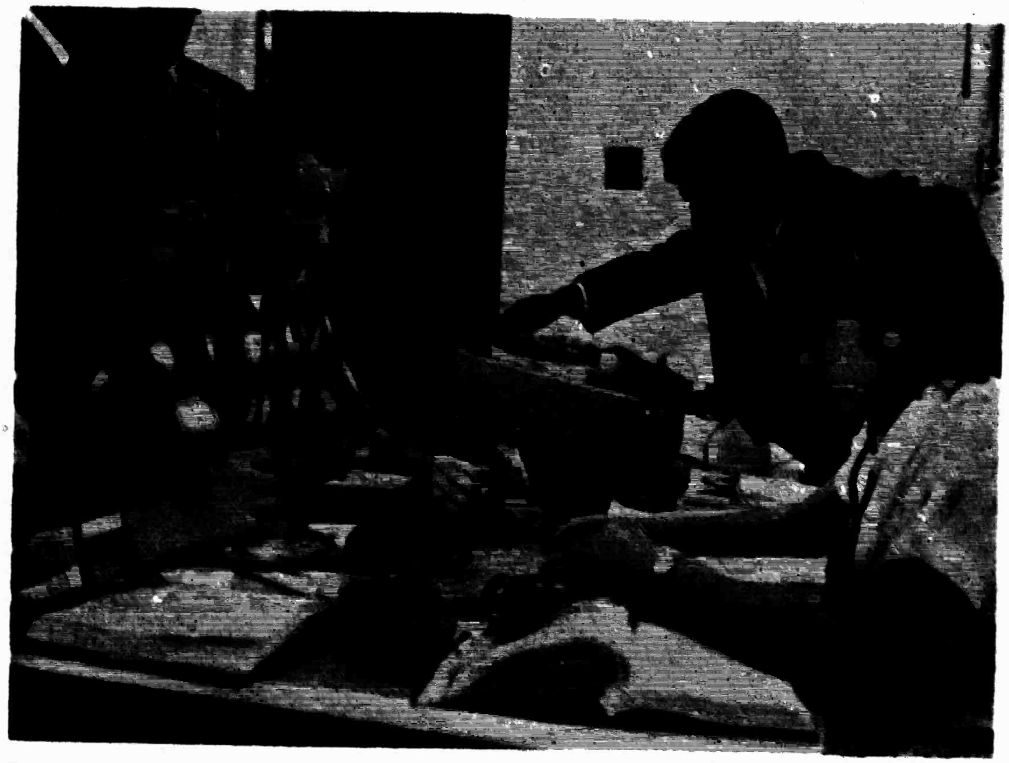


An ingenious teacher can prepare both tapes and written exercises in order to teach Spanish I and II simultaneously to small groups.

This is an area in which the published literature in the immediate months and years ahead will simply be unable to keep abreast of the thousands of amateur and commercial developments. Personifying such developments at the local level, Donald Gould, a teacher of industrial arts in Schenevus, New York, is as inspirational in his own sphere as Dr. John Baxter in his. A listener may not understand the strange new terms spoken by a Donald Gould as he dreams of the electronic classroom of tomorrow, but his past achievements give evidence of the feasibility of his plans.

As merely one example of his accomplishments, Gould has constructed 15 types of auditioning apparatus, any one of which can be assembled and installed by his own industrial arts students at costs for parts per individual listening station ranging from $3.65 to $7.90. Such equipment has been in operation for the business education course at Schenevus for over a year. Multiple classes in this field of study have been made practical by Gould's creativity.

When properly used by teachers with some training in this area, tape recorders free teachers of much routine drill; students are encouraged to re-use learning materials when needed; absentees may

make up missed lessons; and certain appropriate instruction can be handled on an individual tutoring basis.

As with all our newer electronic devices, it is repeatedly emphasized that tapes are but supplementary devices—new tools to be used by the teacher when they can perform effectively a job that saves his valuable time.

Both commercial and teacher-made tapes are in use at present, but the latter offer the greatest flexibility. Teachers know best what they wish to tape, and there is reassurance in certain instances for the student to hear electronically the familiar voice he is used to. Teachers will need time to prepare good instruction on tapes, but one approach is being tried whereby teachers are employed during a summer month for this work. Plans for the exchange of especially good tapes among several schools is still another possibility.

Of special interest to teachers of foreign languages in small high schools will be the research contract recently negotiated between the U.S. Office of Education and the Glastonbury, Connecticut, public schools for $1 million to develop instructional materials of this type. It is the largest project of its kind ever undertaken. By 1962 a com-

A "homemade" language laboratory in a rural high school. Equipment need not be costly or elaborate to be beneficial.

plete set of instructional materials will be ready for use in grades 7–12. These will include standard magnetic tape recordings as well as audio-lingual discs and tapes for students to use in their homework.

"Auditrons"

The teachers and students in the CAP school at Margaretville, New York, feel that the scoffing and jokes made by occasional observers about their glorified jukebox must be borne patiently. After all, weren't there those who were blind to the possibilities of the first horseless carriage?

Interestingly enough, their present "auditron" is precisely a jukebox, converted to school use. As yet it doesn't belong in the electronics category, but it may be a necessary first step. An unitiated visitor to the traditional school building in this conservative town nestled in the Catskills would certainly be shocked at the scene awaiting him in the school library. There stands a gaudy, chrome-plated jukebox —typical of the musical sentries that stand watch over most taverns and sundry entertainment spots in our land.

But this jukebox is different. Its waiting discs are all recordings by serious artists, identified by the selector, from the fields of American history and literature. Eight sets of earphones are connected from the jukebox to eight stations at a nearby table. An opportunity is presented to sit down for a moment and share with some students a selection by Carl Sandburg on Lincoln. Of course, all students must listen to the same selection at present.

But this is not planned as just a curious and attractive gadget designed to give a respite from formal learning. To Dr. Frank Cyr, professor of education at Teachers College, Columbia University, New York, and executive secretary of the CAP, as well as others who have sparked this invention, this jukebox is but the crude and untested beginning of the push-button age in our schools.

Here stands the prototype of the electronic bank—as significant in its sphere as that first horseless carriage or the Wright brothers' first flimsy crate.

Dr. Cyr has written of the teachers' urgent need, particularly in small schools, for the availability of immense areas of human knowledge through electronic storehouses and electronic transmittal. The electronic bank becomes this agent; the programming of this bank becomes the key: and the teacher selects that which is most meaningful for the learning task of the moment. With such a teaching tool our great dream of individualizing instruction to meet the learning

"There stands a gaudy, chrome-plated jukebox . . . but . . . different . . . the prototype of the electronic bank."

demands of each student could come closer to being a reality, and the teacher could be freed from the "coolie labor" aspects of his task. If the prediction is even approximately accurate that in the school of the future one-half of each student's time will be spent in learning through technological communications, one-half of his time still remains to be planned by the teacher for truly creative learning.

It is interesting to note that many administrative tasks in schools are now being performed by computers and other automatic data processing machines. Fortunately, educational institutions have not fallen victim here to the usual time lag but along with industry are moving forward during this transition period from electro-mechanical hardware to electronic hardware. In their present state of development, automatic data processing machines are considered economical only for school systems of more than 1,000 students, but this estimate may be lowered soon, and the implications for schools everywhere remain significant. Finally, it is encouraging for those who envision electronic banks that there is very nearly unanimous acceptance by school authorities of automatic data processing techniques.

Flexible Scheduling

The Rationale

The basic idea of flexible scheduling—present but largely dormant in the minds of many school administrators for years—is remarkably simple. The idea grew from the repeated question, "Must all subjects for all students require the same number of minutes during identical hours each day?"

The formulation of the flexible scheduling idea, then, has gradually evolved into the hypothesis that more efficient learning might possibly take place within the framework of a daily schedule in which classes would be of unequal length, would meet at differing periods throughout the week, and would be truly geared to the individual needs of the students. Even to test this hypothesis, however, requires the serious questioning of a basic educational assumption that making a schedule is simply a matter of dividing the predetermined school day into equal divisions and fitting in the predetermined number of class sections based on enrollment.

Such an assumption among the administrators of small high schools, it is suspected, has been based largely on administrative convenience. It is a schedule much easier to make than a flexible schedule, and it allows a much larger margin for error: one period each hour is called "study hall," and any student not scheduled in a class is assigned to it. Historically, we have always had too many students assigned to study hall for two and even three hours daily, while other students had none. As a result, an increasing number of administrators have expressed concern over this situation, pinpointing the following serious disadvantages of the study hall:

1. The atmosphere is seldom conducive to independent study. Many students tend to misbehave, to sleep, or to escape from such an environment through truancy or daydreams.
2. Most teachers view such an assignment as inevitable, as a burdensome chore, and as a waste of their time and talents.
3. Most gifted students hope to avoid it because of its atmosphere and because no teacher in charge can assist them with study problems in more than one or two areas. Even then such assistance may conflict with the instructions of the classroom teacher.
4. Poor students, who need constant supervision and assignments, actually strive to be scheduled here in order to loaf.

Two considerations are involved in the idea of abandoning study hall. First, it would appear that any student could study a subject

best while under the supervision of the teacher assigned to teach the particular subject. Furthermore, for each "study hall" abandoned there exists the opportunity to add one course offering to the curriculum.

How did the traditional class schedule with its "study hall" become so entrenched? That story, so well known to school administrators, is largely centered on the anachronistic Carnegie Unit. Oddly enough it arrived on the scene as a badly needed innovation in order to help the colleges have a standard for determining the capabilities of those high school graduates who sought college entrance. It brought order out of chaos. At that time, over a half century ago, the high schools of this Nation were serving only a college-preparatory function. How radically every facet of our world has changed! Yet the "unit" remains the same and is basically responsible for the class schedule in use now as then.

The question of the "unit" must, of course, be resolved within each State where any high school is to experiment with a class schedule

. . . And no study hall.

that might violate the letter of the educational laws. The school authorities would be wise also to confer with the admissions authorities at the several colleges to which most of their graduates seek entrance. In fact, this has been done satisfactorily in several places, and the particular laws and requirements in question have proved no serious roadblock to experimentation.

Surely the new challenges to such an inflexible system deserve a hearing. There may be overwhelming justifications for the traditional schedules in the larger schools, where hundreds and even thousands of students must be accommodated, but we are here speaking only to those high schools enrolling less than 200.

The point has been cogently made by many observers that the problems of the small high school are no more like those of the really large high school than are the problems of the small farmer or businessman like those of the King Ranch and General Motors, respectively. A new design for small high school operations is needed, and the present operative plans of large high schools would seem to be of little assistance. In fact, many experiments in the scheduling of classes for large high schools are also being conducted now, but few if any of them would have significance for small high schools.

Among the latter there is a growing tendency to regard the traditional class schedule as an unwise use of time on the part of student and teacher alike. Given a school day of so many hours for a determined number of days per year; a number of courses, activtities and experiences which you call the curriculum; and a number of students to be scheduled according to some pattern—how could the job be done differently?

Three approaches are already underway. In the first, which we might call Phase I, we have seen double periods in programs subsidized by the Federal Government; alternate periods for physical education, music, or study halls; adjusted lunch periods; extended school years; the expediency of double sessions to combat overcrowded conditions; and, of course, summer sessions. But these devices do nothing to remedy the basic problem of the static schedule. We have followed with interest the block-of-time experiments in the general education area of junior high schools, but these are not directly applicable to senior high schools.

Phase II has seen significant schedule changes, proposed by administrators who have modified the school week by abandoning the traditional five-day sequence of classes and have extended the length of class periods to between 60 and 75 minutes. Though the general proposal is a half century old, its practice has become relatively widespread only in the last decade. Other features of this proposal in-

clude: supervised study within each course and the elimination of study halls; the meeting of most classes for an average of seventy minutes each of four days; a "diagonal" or "floating period" which meets at different times each of four days; and an actual increase in the number of total subjects offered in the curriculum. Furthermore, most students can study five major subjects instead of four, and yet no student will follow the same hourly schedule any two days of the week.

However, even this type of schedule, which includes several variations as yet without a common name, is recognized as only a phase or transitional step away from the traditional schedule. It is a beginning, not an end. Its singular weakness remains: Most classes continue to meet for the same number of minutes per week for all students regardless of known differences among students and among subjects to be studied.

Not until we end our quest to equate learning with the number of minutes we sit in a classroom and not until we recognize the full significance of the differences in learning abilities among all students in all subject areas will we have achieved any major breakthrough in the design of the "master schedule." This would constitute Phase III in which the time spent by any student in his particular classes would be determined by his previous progress and his need to study in a certain subject area during a given year. In other words his school day would be geared to his learning needs and not the demands of an inflexible schedule designed for the statistical norm.

The very concept of such an unplanned "plan" might sound chaotic to an experienced school administrator hearing of it for the first time. Certainly, much research must continue on such a concept in order to determine its feasibility, its possible advantages and disadvantages, and its practical implications. It is tentatively called the "modular schedule" and rests in theory on time modules which are joined together into various combinations for different students depending upon their needs. A new study of scheduling theory has only recently been published, and the reader interested in a detailed presentation of the modular concept as well as other varied experiments currently underway is referred to:

> *The High School Principal and Staff Develop the Master Schedule.* David B. Austin and Noble Gividen, Bureau of Publications 1960. Teachers College, Columbia University, New York.

Obviously, students will continue to be meeting in groups of varying sizes for most of their learning in any class schedule. Beyond this one assumption, however, there are many possibilities for the

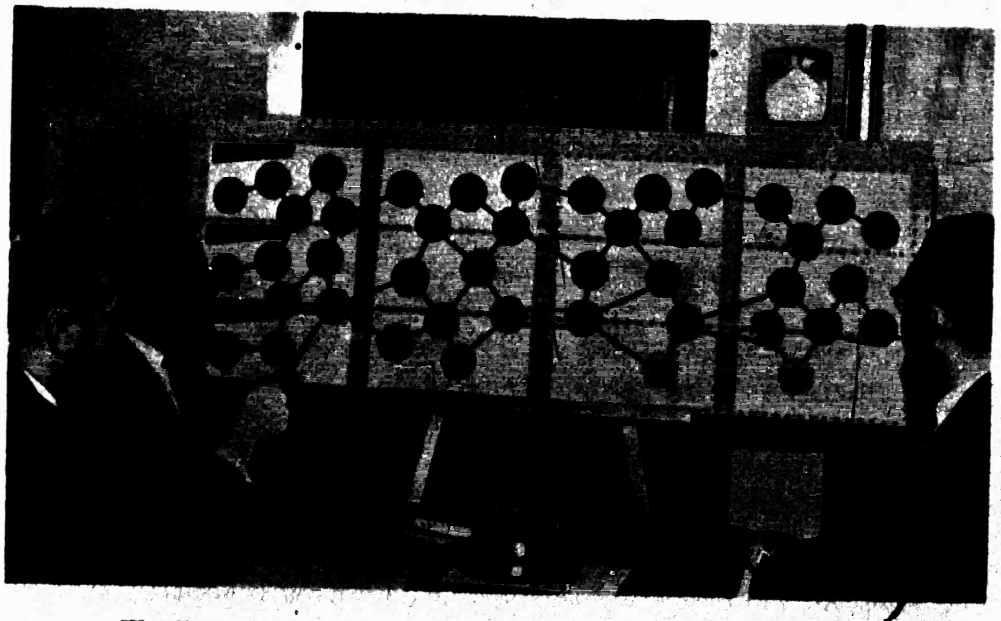
creative faculty and administrators who determine precisely how this is to be done.

The flexible schedule for tomorrow's "necessarily existent" small high school must begin at its point of unique strength—its concern for the individual student and its intimate knowledge of him. On this premise it has a valid foundation for serving its students well in a world of increasing bigness.

The Reality

No study of all relatively small high schools to determine the number or percentage in which schedule experimentations are in progress has been conducted. It is estimated that such experimentation would be found only in an insignificant minority. Yet, in the hundreds of schools forming this minority the results have been very encouraging.

There is no definite pattern of change yet, nor will there be probably. By the very nature of small schools and the communities they serve, there will be and should be changes made in the very innovations they borrow and make use of. Nevertheless, the "70 minute schedule" or "floating period schedule," as described in Phase II, has become the most common type of modified schedule. Figure 2 shows a sample of such a weekly schedule designed for a small junior-senior high school enrolling 280 students but with less than 200 students in the upper four grades.



Flexible scheduling is more feasible in the small high school.

Figure 1.—Sample "70 Minute" Weekly Schedule [1]

	8:00–8:15	8:20–9:30	9:35–10:45	10:50–12:00	1:05–2:15	DIAGONAL 2:20 Monday
MONDAY	Home room	English 7[1] Soc Stud 7[2] Science 8[1] Math 8[2] Gen Bus 9 English 9 Gen Shop 9 Band 7-12 Chorus 10-12 P E 10-12 Chemistry Shth IV	Math 7[1] English 7[2] Soc Stud 8[1] Science 8[2] English 9 Biology 9 Driv Ed English VI Homemaking VIII Homemaking I Pl Geometry Health & Saf US History Typing II	Soc Stud 7[1] Math 7[2] Math 7[1] English 8[2] P E 9 Cler Practice Driv Ed Homemaking I Homemaking III Homemaking VII Wood Shop Physics World History	Homemaking 7[1] M W Shop 7[1] M W Science 7[1] TH F Science 7[2] M W Homemaking 7[2] TH F Shop 7[2] TH F English 8[1] Soc Stud 8[2] Music 9 Vocations 9 Prac. Arts 9 Latin IV Solid Geometry Dramatics English IV Shth II Art II	P E 7 M T Music 7 Th F Art 8 M T P E 8 Th F Gen Math 9 Algebra 9 Bus Arith 9 Civics Economics Metal Shop Speech Homemaking VI Typing II DIAGONAL
TUESDAY	Home room				1:05 Tuesday DIAGONAL	2:20–3:30 Art 7 Homemaking 8 Shop 8 Latin 9 Bus Arith 9 Biology 9 English IV English VI English VIII Mid Nations US History
WED	Home room			ACTIVITY PERIOD Clubs		
THURS	Home room		9:35 Thursday DIAGONAL			
FRI	8:00 Friday DIAGONAL		9:05–10:05	10:10–10:45 CONVO		

[1] Adapted from the schedule at The Laboratory School of Indiana State Teachers College in Terre Haute, Ind.

The psychological advantages of a flexible schedule are perhaps as significant as the mechanical advantages. (This schedule can be modified in a variety of ways.) For example, on no day of the week will any student or teacher follow exactly the same schedule as he followed any other day; no teacher is called upon for study hall

duty; each student does his studying for each course directly under the supervision of the course instructor; and seventy minutes should challenge the most unresourceful teacher to use a variety of classroom activities other than the lecture.

Another type of advantage is apparent in the longer class time available for field trips and other activities. Furthermore, there is the distinct advantage in certain courses of engaging in the preparations for beginning and ending a class only eight times a week instead of ten.

A simple variation of the basic plan is to rotate or revolve consecutively seven class periods through six-period school days, as illustrated in Figure 3 by a typical student's schedule in Margaretville, New York. Two extra periods which may be used for activities can be scheduled in whatever two periods desired. As noted, the flexibility in this case was hampered by the shared services program which required that the industrial arts class meet only at 11:50 daily. Therefore, all classes meeting during this period had to be locked.

Figure 2.—Sample Schedule for Typical Margaretville Senior

Note: Numbers in block corners designate the number of the period. Fourth period is "locked" four days a week so that industrial arts students from a nearby school can come to the teacher and facilities in Margaretville.

	Mon.	*Tues.*	*Wed.*	*Thurs.*	*Fri.*
8:45–9:43	1 French IV	6 English	5 Phy. Ed.	3 Chemistry	1 French IV
9:45–10:43	2 Amer. His.	7 Band	6 English	5 Phy. Ed.	2 Amer. His.
10:43–10:50	BREAK				
10:50–11:48	3 Chemistry	1 French IV	7 Band	6 English	3 Chemistry
11:50–12:48	4 Latin II	4 Latin II	4 Latin II	4 Latin II	5 Phy. Ed.
12:50–1:10	LUNCH				
1:12–2:10	5 Phy. Ed.	2 Amer. His.	1 French IV	7 Band	6 English
2:12–3:10	x Activities	3 Chemistry	2 Amer. His.	x Activities	7 Band

But it must be repeated that this type of schedule cannot be regarded as an end product in schedule experimentation. It is merely one step along the way; it is the first successful break from the past.

Dr. Gividen, in particular, is continuing his studies of ways in which the class schedule for small schools can be improved. It is his firm belief that considerable improvements in basic schedule changes must take place if the "necessarily existent" small high schools are to move forward on a solid base.

For further information about flexible scheduling, contact:

Dr. Noble Gividen
District Superintendent of Schools
Westchester County
Bedford Hills, N.Y.

Multiple Classes and Small Group Techniques

The Rationale

The definition of multiple classes is practically self-explanatory. Two or more subjects are taught in the same room by the same teacher at the same time. The use of small group techniques of learning is exactly what the name suggests.

Far from being new, the multiple class is one of the oldest techniques in the history of education. Many of our readers can recall their own school days in the one-room elementary school where this was precisely the technique used. However, there, and in our smaller high schools where it has been employed through the years, it has been increasingly viewed as an expedient—a last resort. Small group techniques, on the other hand, are used in all learning situations.

Multiple classes are still necessary as an expedient in some small schools in order to broaden the curricular offerings. In the RMAP and CAP schools, however, it is felt that these classes, based on small group techniques of learning, *can* be so conducted that the student will learn as effectively as he would in a single class. The difference is brought about principally through the use of tape recorders and other electronic devices whereby the teacher's resources are strengthened, and learning takes place more on an individual basis.

If it is eventually proved to be true that the student can learn just as effectively in a multiple class setting, this will be very significant for small schools.

Dr. Frank Cyr states forcefully that multiple classes and small group learning techniques form the basic pattern for the small school design of the future. In fact, he goes further and posits all other experimental techniques in the CAP to be but means to this end. Dr. Cyr elaborates upon this when discussing purposes:

> The purpose of this Project (CAP) is to develop a basic reorganization of small school design which will increase the variety and quality of educational opportunities for the learners through the uses of multiple classes and small group learning techniques.

Dr. Cyr's thesis must legitimately be considered alongside a question raised by Dr. Harry Passow, educational psychologist from Teachers College, when speaking at the third annual RMAP workshop last June. Referring to *all* new aids and techniques of learning, Dr. Passow suggested the following criterion as most important when examining them: "Do they affect learning favorably, and do they *improve* learning?"

"Multiple classes could never work without the use of small group learning techniques . . ."

The Reality

After three years of experimentation with multiple classes in the CAP and the RMAP, it seems far too early for anyone to hazard more than an opinion as to the success of this technique. Yet there is a greater conflict of opinion over this technique than over any other single one described in this publication.

Its theoretical potential for small schools is seldom questioned. Its overall effectiveness to date has been questioned—often by the most conscientious and sincere teachers of multiple classes. Others have endorsed it enthusiastically. To attempt such instruction at all requires versatile, creative, intelligent and hard-working teachers, backed up by much electronic equipment and the time and knowledge to use it.

In all 23 schools which comprise the CAP, only 8 percent of the total course offerings in 1959–60 were through multiple classes. Nearly all subject fields were represented. That some of these multiple class situations have worked well is "indisputable"—except that there is little objective evidence to prove it. Several have apparently not worked well, but again there is no objective evidence.

Obviously, sound criteria and experimental control groups have been lacking. However, multiple class adherents point to the scores on standardized achievement tests, made by students from multiple classes, and say these students have done "as well as" other students in past years. This is partial evidence, certainly.

But some teachers of multiple classes feel that even the most signal gains of such combinations have been won at an unjustified human cost. The toll of the extra work load on a conscientious, devoted teacher can be excessive. Preparing for 8 or 9 courses daily in some multiple combination, rather than the typical 5 or 6, is not an assignment to be undertaken lightly. Even conducting three classes during one hour for three small groups is more demanding than conducting one class, to say the least.

This point was one of several commented upon by special observation teams from Colorado State College at Greeley, who acted as consultants with the Colorado State Department of Education when they visited RMAP schools in the spring of 1959. Concluding their comments, they stated:

> **Most teachers maintain that the multiple classes demand more time for planning, preparation, and evaluation than do single classes. This increased time ranged, in their estimates, from one and one-half to two times that for the single classes.**

Of course, no two multiple class situations are the same. The variable factors of the number enrolled, the relationships of the multiple courses, the availability of electronic devices, and the time to prepare for the classes are all vital considerations.

School administrators in both the CAP and the RMAP are fully aware of these factors and their importance. Many teachers have designed certain projects related to multiple classes and have been paid for an extra month to develop their plans during the summer. Some are paid extra to attend Saturday workshops during the school year.

But the empirical evidence suggests that the really promising results have been achieved by truly outstanding teachers *because* they are outstanding teachers—not because of multiple classes. Bright, responsible students have often helped immeasurably. It is perhaps interesting to note that several of the most efficient teachers of multiple classes in both the CAP and RMAP have resigned to take teaching positions which pay better salaries in schools outside the projects. Conflicting reasons for their leaving have been suggested. The most simple explanation, unrelated to multiple classes, may be that the teachers needed a higher salary.

Perhaps it is unfortunate that the mutually exclusive techniques of multiple classes and small group methods of learning have been made the dual bases of the rationale for improving the instructional programs of small schools.

Multiple classes can never work without the use of small group learning techniques, but the latter can be applied to any learning situation. That such techniques have not been applied too frequently in recent years has been due in large part to our overcrowded classrooms and to the teachers' understandable decision to lecture to the norm group.

Certainly experimentation with small group techniques of learning in the CAP and RMAP constitutes one of the most exciting phases of the work of these projects. Although the theory of small group instruction is being given increased attention in educational literature, it remains an imprecisely defined area of instructional methodology.

For definitive statements on the use of these techniques and a listing of the most recent writings in this area, contact:

Dr. Phil Lange
Teachers College
Columbia University
New York 27, N.Y.

Many small high school administrators seem to feel that if courses are to be added to the curriculum, multiple classes serve as the only alternative. These courses are usually the specialized or advanced courses needed by juniors and seniors planning on college or a particular vocation.

Perhaps this is not the only alternative; but where it is considered to be, multiple classes will fill the need best for courses where enrollments are small, where enthusiastic and competent teachers are carefully selected and given adequate compensations, and where the subject matter for two classes taught simultaneously is closely related.

The desirability of using closely related subject matter for multiple class situations cannot be to strongly urged. Such statements as the following, made by a former high school teacher in the CAP and quoted in a national magazine, would be difficult to defend and might lead to serious questioning of the total multiple class concept:

"Two or more subjects are taught in the same room by the same teacher at the same time."

> We have never tried such unrelated subjects as language and math, but if the teacher had the proper materials, there would be *no reason* why she couldn't do a bang-up job. In fact, it is possible that with the proper teaching aids, a skillful teacher *who does not qualify* in a particular subject might still be able to create an atmosphere, in a multiple class, that would make for good learning. [Italics added.]

Of course, not all so-called multiple classes in the CAP and RMAP are actually multiple courses in the sense that two or more groups of students are in a room together. Instead, it is quite common to find in these projects a group of students studying one course in a room alongside two other students "enrolled" in two separate courses. In fact, one school actually had an arrangement in an art period where twelve students were engaged independently on various aspects of art via the individual project method. This was referred to as a multiple class situation; students were given credit for different art courses; so, by this school's definition of the term, there were twelve "classes" in progress simultaneously.

Actually, such instruction on an individual project basis is quite common in certain curricular areas in many of our high schools and can scarcely be called a multiple class situation.

If the concept of multiple classes based on small group learning techniques (not a tutorial basis) is to be judged on its merit, it would seem that no less than a minimum of three students should be enrolled in each "class." A more typical multiple class situation would be a dozen ninth graders studying elementary algebra and an approximately equal number studying general math. With the development of adequate criteria and a control group on a matched basis, a more objective decision could be reached regarding the success of students in the multiple class setting.

Finally, the advocates of multiple classes need to consider fully the impact of one further contemporary movement in our schools. It is purely coincidental that the organized experiment of multiple classes was begun one month prior to the launching of Sputnik I. This event focused our attention upon some neglected aspects of American education and no doubt hastened the introduction of certain changes and emphases in the curriculum.

One result has been to place a renewed emphasis on the compartmentalization of subjects and the specialized training of teachers in distinct subject matter areas. For better or for worse—and it is not our purpose here to debate this complex problem—that is the trend in the 1960–61 school year.

Teacher Assistants

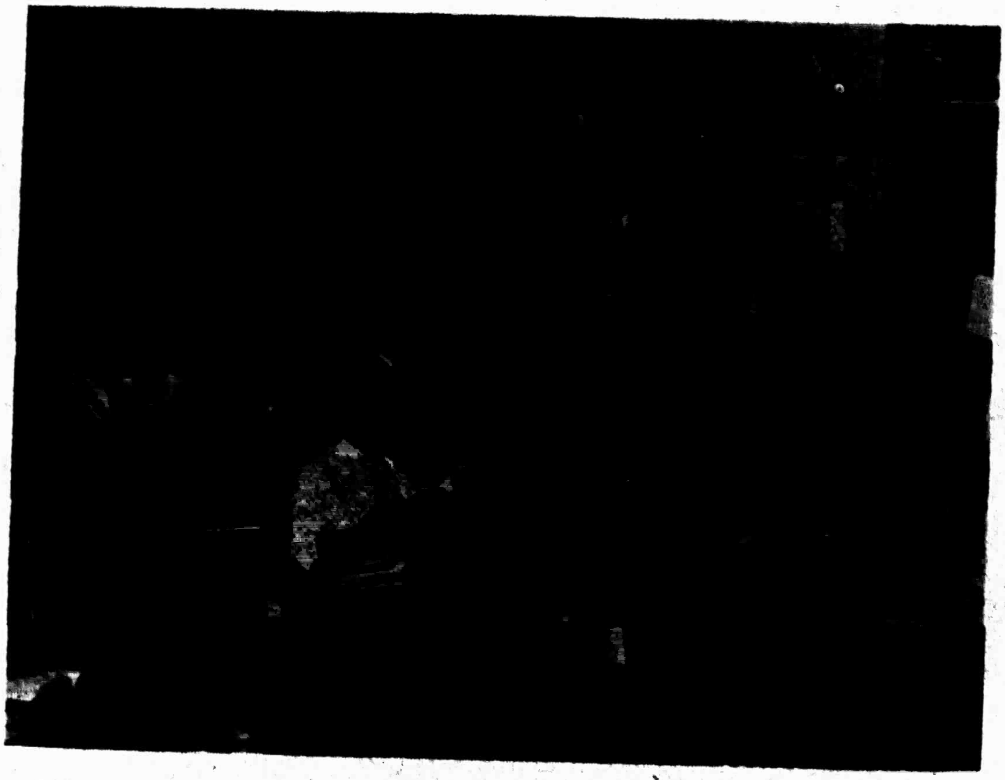
It has been previously emphasized that the new practices and facilities described in this and many other publications are sweeping us into a period of change unparalleled in the annals of organized schools. Historians may well look back upon the present years as the beginning of an instructional revolution in America—and possibly throughout the world.

Plagued since World War II by educational shortages as vexing ironically as our agricultural surpluses, we have for too long been content simply to wait for the day when we would have enough money, enough teachers, enough buildings. Then, we have said, we could do the job properly. But while the population explosion has not subsided, the public still has demanded the very best education for their children. Rather suddenly we have realized we must find new solutions to these problems—*in spite* of shortages of money, teachers, and buildings.

One of the most promising approaches has involved efforts to make the most efficient use possible of our professional teachers' time, talent, and skills in order to improve the quality of instruction. In other words, let the professional do only his professional work, and let people less skilled assist in doing the routine tasks. This plan cannot be promoted as a money-saver: indeed, it will cost more money. But as a plan for the wiser use of teachers' time and, therefore, as a wiser expenditure of public funds for securing quality instruction, it will appeal to almost everyone.

After the professional teacher has spent four or more years of intensive study to prepare for his work, is it then a wise use of public funds to pay him to keep study hall, preside over lunch rooms and cafeterias, chaperone students on buses, type and mimeograph tests, take attendance, make innumerable entries in record books, collect fees, and perform a host of similar time-consuming routines? These are all important jobs which must be taken care of in all schools, but must they be performed by teachers?

Dating from the first experiments a few years ago in Bay City, Michigan, schools of all sizes have been increasingly hiring housewives and other nonteaching personnel to serve as assistants in order to release teachers for teaching functions. A new category of school employee with distinct nonteaching duties has evolved. They are referred to in the literature as teacher assistants, lay readers, school aides and teacher aides.



A CAP teacher aide prepares to monitor a class after receiving instructions from the high school principal.

One of the most systematic and well-developed plans of this type is found in the Catskill Area Project (CAP). Although one project school has employed such an aide for 18 years, the systematic plan was initiated in a few schools three years ago as a supplement to the basic CAP purpose of developing a reorganization of small school design. Little was expected of this program in the beginning, but it has grown to be one of the truly outstanding contributions of CAP.

Eighteen aides, as they are called, were hired and trained in a few schools during the first experimental year; 33 were employed in 18 schools the second year; and 53 were busy assisting the teachers in 27 schools during the past school year. Their performances have exceeded the most optimistic hopes of three years ago.

CAP planners believe firmly that their teacher aides should be paid for their services and that noninstructional tasks should constitute their only assignments. They have even arrived at their own definition of an aide:

> A school aide is a versatile, resourceful adult who relieves, on a paid basis, two or more teachers of necessary, time-consuming tasks not directly

related to instruction. She may work on a flexible time schedule carrying out activities of varying importance designated by professional personnel.

Any school considering the use of such personnel should study carefully the potential advantages and possible disadvantages of such a program. The CAP people are the first to emphasize that such a program does not automatically work by waving a wand. They started on a small scale, grew slowly, and worked hard to inform teachers, students, and parents of its advantages. After three years the vast majority are enthusiastic supporters.

CAP has undoubtedly planned with great care (and been a little lucky) in selecting 53 aides who have worked out so well. Many of their duties had to be modified along the way in light of individual strengths and weaknesses, the program of the school, and the inevitable personality relationship between teacher and aide.

In any school contemplating the use of assistants for professional teachers, all these factors (differing slightly in application) will be vital considerations. Perhaps some schools have less real need for them than others. However, for those schools where the need exists there is ample evidence from the CAP and similar projects that such a plan *can* work and work effectively to relieve professional teachers of nonprofessional tasks and thereby make possible the improvement of instruction. Much evidence of this can be seen first-hand in school after school in the Catskill Mountains.

Details of such a program from its planning stage to its implementation could not be described here. They have been treated very carefully in a definitive brochure prepared by the CAP and entitled, *School Aides at Work*. Copies may be obtained by writing:

Catskill Area Project in Small School Design
215 Home Economics Building
State University College of Education
Oneonta, N.Y.

Shared Services

The idea of small schools in different school districts sharing professional services is certainly no new concept. But the growing shortage of qualified teachers since World War II and the increasing recognition of special services, vital in schools of all sizes, have led to a rediscovery of the potential value of sharing specialists in areas where no one school can justify the added expense of hiring such a specialist.

There are many school districts which could profit immediately and tremendously from the shared-service plan. One ingredient, however, is prerequisite to success. That ingredient is cooperation. Such cooperation can be arranged legally and relatively easily in a number of ways. In New York State it was made possible legally by the authorization in 1948 of Boards of Cooperative Educational Services. To date some 60 such Coop Boards have been established and are doing an effective job of sharing services. Statistics for a few selected types of services point up the sharp increase in number of persons available in 1959–60 as compared with 1953–54. (Each figure represents the equivalent of full-time persons employed in this type of service during the school year.)

Type of service	*Full-time equivalent personnel*	
	1953–54	*1959–60*
Art	41.8	119.7
Dental Hygiene	55.3	130.4
Driver education	28.5	108.9
Guidance	25.2	91.3
Library	3	45.1
Psychological services	19.4	146.9
Speech correction	0	114.2

"Circuit Teachers"

The most obvious manner in which school districts can utilize shared services is by sharing teachers. This is the predominant pattern in the Catskill Area Project (CAP) wherever schools desire services not previously available. Teachers simply go from school to school on a scheduled basis to teach their classes or offer their specialized services. However, the pattern of shared services varies in current actual practice according to the number of teachers available and the number of schools sharing their services—from the two schools sharing an industrial arts teacher to the seven schools sharing a psychological consultant.

CAP likes to draw a comparison with modern medical practice:

> The local practitioner provides essential services, but he calls upon specialists to meet needs and services he cannot provide. . . . Pupils in small schools *can* have the same wide variety of educational opportunity and services that girls and boys everywhere need in our increasingly complex society.

Under such a plan among school districts the specific and unique advantages for a particular small school include provision for services (1) that are not needed daily, (2) that have too little de-

mand to justify a full-time specialist, or (3) that would cost too much for one school to afford.

One can sense the tremendous impact upon a small school in a small community of these specialists' services. Aside from the obvious benefits to the students in this strengthening of the curriculum and the total school program, a definite change in teacher morale and citizen pride can be noted. For the very first time "we" are offering French; or "our children" have a trained teacher of art; or "we" have the services of as fine a psychologist as can be found in any city. Intangible gains these may be, but they are real.

While not necessarily a disadvantage of shared services, the outstanding problem in such a plan is finding professional people who are willing to "ride the circuit." The problem is not insurmountable, but involved are obvious difficulties. Continuous travel is required. Considerable adjustments are called for in working with greater numbers of pupils, teachers, and school administrators. Some teachers understandably need a "home base" in order to perform their duties most effectively. In the last analysis certain aptitudes and interests on the part of these specialists must be considered by the cooperating schools.

It is unfortunate that the program of shared services in CAP has somewhat blocked the development of flexible scheduling plans. This conflict, growing out of experimentation with both programs, was not anticipated, so it should be thoroughly studied by other schools planning to use both these features.

The conflict is this: Shared services must be ridgidly scheduled, while plans for flexible scheduling usually call for courses meeting at different times on different days. Therefore, if the industrial arts "circuit rider," for example, can be scheduled at Margaretville only during the fourth period of the day (see student schedule on page 34), then the experimental schedule at Margaretville is severely affected. Industrial arts plus a complete set of courses for all students must be scheduled and "locked" during the fourth period. As any experienced high school principal knows, planned flexibility in the schedule is thus limited to an even greater extent than is at first apparent.

A choice of educational values is involved here. The obvious and proven values of shared services can scarcely be sacrificed in order to allow experimentation in an area where proof of value is hard to assess. On the other hand, even first steps toward attempts at flexible scheduling will seldom be accepted by principals who see such severe scheduling handicaps at the outset. Experimentation in our public schools involves many risks even under "perfect" conditions.

Shared Students

A variation in the program of shared services is for one school to transport a group of students to another school for a certain course. This is feasible and desirable where one school has special facilities not available in a neighboring school. A shared teacher may or may not be a part of the same plan.

Still another minor variation is for two schools to "exchange" students for a class period or two. For instance, a class in agriculture at one CAP school travels to a school in another district, while a group of students from the second school pass them on the road headed for their vocational arts course in the first school. In this way each school can concentrate increasingly on expanding its facilities in one area without needing to supply facilities at all in the second area.

The result to both schools is a better balance of course offerings at a lowered cost. The problem of dove-tailing the two schedules and allowing for travel time has not proved to be a serious one.

Plans for these programs of shared services plus many practical operational suggestions are contained in a brochure entitled *Sharing Educational Services.* Copies may be obtained by writing:

Catskill Area Project in Small School Design
215 Home Economics Building
State University College of Education
Oneonta, N.Y.

Out of School Seminars

A type of shared educational service which is gaining in popularity involves the cooperation of the high school and either a neighboring college or outstanding lay citizens. The emphasis is upon providing gifted or highly talented students with an organized learning experience not normally available in the high school.

This type of service seems particularly appropriate for small schools, and both the CAP and the RMAP have sponsored such planned seminars. In each project a selected group of truly gifted students from several schools were brought together for scheduled meetings.

The RMAP selected a committee of teachers who planned and conducted two-hour evening seminars periodically in a central location for all participating schools. Guest lecturers were often brought to these seminars, and a discussion period in which the students could ask questions followed the lecture.

"Able and ambitious" students benefit from a lecture at a fine arts center during their evening seminar.

The CAP has established a more formalized pattern in cooperation with the State University College of Education at Oneonta. During the past school year 115 students were transported each Saturday morning to Oneonta where they were enrolled under college instructors in two sections of the humanities and one each of the social sciences, mathematics, and science.

It has been suggested that a possible worthwhile variation in either of these plans would be to involve in these same seminars selected gifted students from nearby *large* high schools. The exchange of ideas, viewpoints, and experiences in such a mixed group of talent should be mutually refreshing and challenging.

Team Teaching

In view of the wide publicity given to team teaching experimentation in progress throughout hundreds of schools at all levels, only brief mention of it will be made here. However, most of the information on this subject relates to two or more teachers within a school—usually a large school—but the concept for small schools involves a different point of reference.

There seems to be a growing acceptance of the theory in this area that two heads are better than one. Of course, good teachers have always looked for effective assistance wherever they could find it, but opportunities have been rare indeed when they could find another teacher to assist them directly in a course.

However, TV could change all this. As was mentioned earlier, TV instruction in our high schools will usually serve as the major resource or as supplementary instruction. Seldom if ever will the TV course be intended or accepted as total instruction. Therefore, the classroom teacher must join forces with the studio teacher to form a coordinated "team" if TV instruction is to fulfill its potential.

Certainly this coordination will become imperative in the MPATI project for the teachers in the small schools. The project authorities are already intensively interested in establishing this concept. Actually this cooperative relationship has been described as the greatest challenge of team teaching. This challenge exists in the fact that the two teachers concerned may never meet—or at best meet only briefly for a visit. Therefore, the coordination of their efforts must come through means other than face-to-face planning.

". . . the classroom teacher must join forces with the studio teacher to form a coordinated 'team' . . ." Actually, the two may never meet.

The problem has already been faced by teachers in the RMAP, CAP, and elsewhere who have used the physics and chemistry films. While these films can be used as total instruction, it is probably better to use them as the major resource. In using these films, the classroom teacher must feel as if he really is teaching *with* Dr. Baxter or Dr. White. This attitude is difficult to achieve. To date no objective measure of the use of these films has been made.

Correspondence Courses

Both the CAP and RMAP offer correspondence courses to students in subjects not otherwise available in a school. A decision must often be made whether it is better to offer a particular course through correspondence or in a multiple class situation.

A committee of teachers has selected carefully a group of reputable institutions offering correspondence courses. Included on the list are the University of Nebraska, Pennsylvania State University, and other public and private institutions. In the schools of these projects the student actually takes the correspondence course under supervision of his school. Teachers are encouraged to check the student's progress at least weekly and to offer assistance.

Future Needs

Learning Resource Laboratories

There are distinct limits to the role than can be played by a public school in educational experimentation. This is true for at least two good reasons:

1. The public school is supported by public monies in large part provided by local citizens. Therefore, it is right and proper that they should be more interested in spending their hard-earned tax dollars to support the use of proven methods of instruction in the classroom, rather than to support the testing of experimental methods based on hypotheses. After all, the findings of research sometimes prove a hypothesis to be in error. Such an experiment carried on in the classroom can hardly be expected to please the taxpayer-parent whose child has been involved in the experiment.
2. Necessarily the public school is affected by local, State, and Federal regulations—many written into law. Even when some of these regulations are officially waived, the school does not gain the freedom needed for experimental research. Furthermore, it is extremely difficult for experienced teachers to break with the past. Thus, factors impossible to control can largely negate this type of research. CAP officials are frank to state that the omnipresence of the New York State Regents Examination affects CAP experimentation both directly and indirectly. From certain official viewpoints this might be considered desirable, but it obviously creates distinct barriers for experimental research.

Of course, experimentation will continue and should continue in our public schools. But these limitations will remain. It follows then that we need to produce new laboratories for educational experimentation. These should be of several different types.

We can certainly profit by the research conducted through privately financed organizations such as the Educational Facilities Laboratories, sponsored by the Ford Foundation. Already we are making gains in our public and private schools as a result of the research findings from several foundations of this type.

However, our most imperative need is for learning laboratories in the locations where our *future* teachers are being trained. There

the dual objectives of training future teachers for tomorrow—not yesterday—and of freedom to experiment can be achieved. Historically, research has been a prime function of our institutions of higher learning, but this function has not always prevailed where our teachers are trained.

Obviously, we must also have experimental schools available with representative classes of typical students. These are available now in the backyards of some 275 teacher-training institutions. As student teaching programs have been moved more and more into public schools, these "laboratory" or "training" schools have been looking increasingly for a new function. What more fitting role could be found for them than to return to their original function as laboratories.

It must be said that a few of them have never swerved from their original function, and their research throughout the years has been significant. But these have been exceptions. The public image of such schools, where they are known at all, is one of good, traditional, college preparatory schools.

The opportunities for significant educational research through the development of genuine learning resource laboratories in our teaching-training institutions and the utilization of adjoining laboratory schools where experiments could be conducted under real school conditions appear limitless. A further development conducive to such research would be a cooperative arrangement between each teacher-training institution and its nearby public school districts and private schools. The training program for our future teachers would be geared to these arrangements.

The learning resource laboratories would become the key agencies in such plans, for without them the laboratory school would have no function and the program for training teachers would have a serious gap.

Such a resource laboratory could have its own electronic "bank," its own television studio, and a closed-circuit TV system with all nearby schools. Preparation of every kind of instructional tape and other materials to be used in the regional public and private schools would be a specific function, and teachers from those schools could come in to prepare their own special materials with assistance from trained personnel. If teaching machines become a part of this picture, the preparation of programmed materials can be done here in cooperation with necessary specialists.

Therefore, the resource laboratory also becomes the potential retraining site for that very important job which we now call inservice

training for teachers. There has been increasing general agreement of late that this job of retraining experienced teachers deserves top priority. The radical changes in the very content of mathematics and science, and the methodology of foreign language instruction offer proof of this, if proof were needed.

But how is this mammoth undertaking ever to be accomplished? The learning resource laboratory becomes the pivotal agency upon which can be centered the training of present and future teachers to whatever degree required.

Our future needs then, demand:

- Research laboratories supported by private funds
- Experimental research laboratories at teacher-training institutions both public and private
- Nearby laboratory schools for action research
- Research facilities and findings available to public and private schools
- Facilities to retrain experienced teachers
- That all facilities be focused on teacher education

Conclusion

Such is the story of developments which offer promise to the "necessarily existent" small high schools and to the elementary school children who will attend them in the decade of the 1960's.

The need for change quite naturally varies greatly from school to school. But the need is acknowledged among nearly all. Some will continue with experiments described in this booklet, and it is hoped that all will follow the progress of these experiments very closely for significant implications to their own situations.

There is considerable evidence—and it increases daily—that we are well on our way to a period of unprecedented experimentation among educational institutions of all sizes serving all ages. The need for change seems to have been accepted by the public as well as by the educators: the paramount question before us then, relates to determining the effectiveness of each experiment in improving learning. If proven effective, what conditions must exist for the maximum effectiveness of each experiment, and what are its precise uses?

Among our small high schools the selection by each school of a unique combination of proven experiments to fit its peculiar local situation may well prove decisive. The potential combinations are limitless, but the potential danger is that one school may attempt to copy en toto the experiments being used successfully in a neighboring school without considering local needs. In such a situation a fiasco could result that would deter any further consideration of even the most promising practices used elsewhere.

This is most aptly illustrated by the subtleties involved in the development of a flexible schedule that really works effectively for a particular small high school. One school may indeed make applicable to its situation certain basic principles of flexible scheduling borrowed from another school. If such a schedule is made to work for the second school, however, its differences in detail from that of the first may well be greater than its similarities.

In still a third school the selected combination of new practices may be incorporated into a traditional schedule and yet be greatly

effective. A reexamination of any school program must begin with an accurate appraisal of the local situation and its many variables. Proposed action can never be considered without this foundation.

Finally, the decisive need of our small high schools is for educational leadership based on an accurate knowledge of current research findings. Traditionally, our citizens have rightfully abhorred any outside domination of their local schools. However, the findings of educational experimentation and research constitute in no sense "outside domination," but rather are a compendium of "neutral" suggestions, which may be studied, observed, and applied as desirable in a local situation.

In the past, such findings have all too often never reached the administrators of small high schools. In some instances, the local high school principal, though alert to these findings, may have been unduly cautious lest his urging of their consideration be construed as outside domination.

But increasing indications today point to a new era in education. Local citizens and educators have a heightened interest in innovation, and new nationwide channels are opening up to report new educational developments. A renewed appreciation of the vital role of our schools in developing an enlightened citizenry needed to make our democracy effective is the most encouraging sign as we enter upon these new adventures in education.

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