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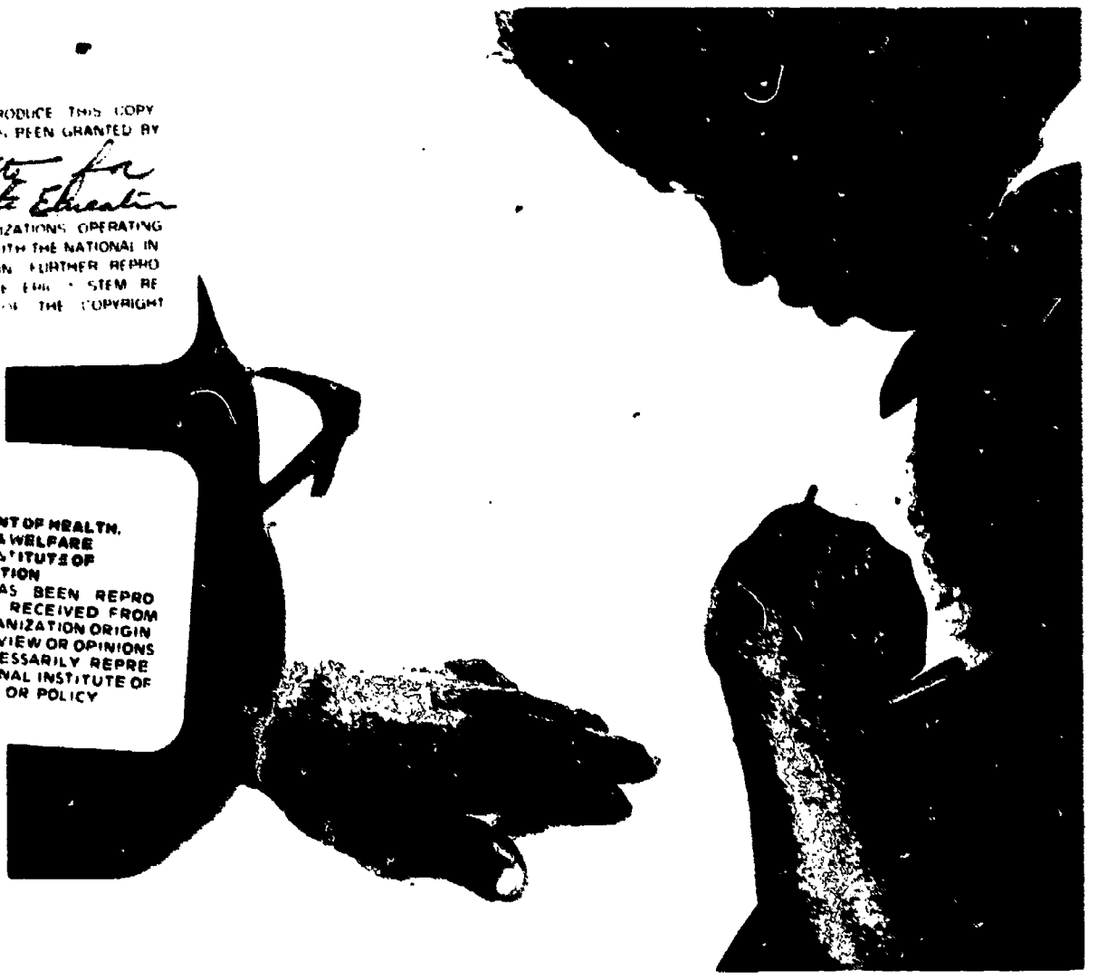
ABSTRACT

The Thirteen College Curriculum Program is a cooperative venture involving predominantly Negro colleges and the Institution for Services to Education. The program is developing five new courses for the freshman year of college and two new courses for the sophomore year. The program consists of 100 students on each campus in the first-year program and 100 in the second year, with a separate faculty of 12 teachers, a counselor, and a director. In its second year, the project has touched the lives of approximately 2,600 students. Another part of ISE's program is to provide teachers, through an 8-week summer conference, the opportunity to think about what they are doing and to share their new thoughts. The results is a curriculum the teachers themselves develop and teach. As the program begins to show itself effective, the plan is to make the experience more generally available, to build bridges into the regular college program, working first with the first two years of college, and then, hopefully, with the upper levels. Sections of this report cover student background and achievement, student evaluation of the program, a teacher's impression of teaching, and samples of teaching plans from the teacher workshop, a math and a science class. Appendixes include: funding agencies, college presidents and project directors, ISE board members, and the ISE staff. (Author/PG)

Journey into Discovery



The Thirteen-College Curriculum Program

Institute for Services to Education

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William J. Nicholson, excerpts from "Switches and Batteries," by the Curriculum Resources Group of the Program for Pre-College Centers, a division of ISE.

The Colleges . . .

(There are actually fourteen colleges. Mary Holmes, the fourteenth college, joined the consortium in 1968. Clark coordinates the grants to the colleges.)

Alabama A & M College
Huntsville, Alabama

Bennett College
Greensboro, North Carolina

Bishop College
Dallas, Texas

Clark College
Atlanta, Georgia

Florida A & M University
Tallahassee, Florida

Jackson State College
Jackson, Mississippi

Lincoln University
Lincoln University, Pennsylvania

Norfolk State College
Norfolk, Virginia

North Carolina A & T State University
Greensboro, North Carolina

Southern University
Baton Rouge, Louisiana

Talladega College
Talladega, Alabama

Tennessee State University
Nashville, Tennessee

Voorhees College
Denmark, South Carolina

Mary Holmes Junior College
West Point, Mississippi

. . . and ISE

Thirteen has proved a lucky number for curriculum reform. Like those buildings with no thirteenth floor, we could have avoided the number, calling the project "The Baker's Dozen" or, with the summer conferences interpreted as a kind of additional college, "The Fourteen Colleges Curriculum Program." We started the summer of 1967, and in 1968 a genuine fourteenth college did join the group. But we have stuck with the number thirteen, or an occasional "Thirteen Colleges Plus One."

The project is a cooperative venture involving fourteen predominantly Negro colleges and the Institute for Services to Education. ISE helps teachers develop new instructional materials and practices, and it runs summer and week-end conferences for teachers. The program is developing five new courses for the freshman year of college and two new courses for the sophomore year. Using traditional titles, the courses selected for the freshman year are: English, mathematics, social science, physical science, and biology; and for the sophomore year, humanities and philosophy. (Other courses the second year are selected from regular college offerings.) The program on each campus consists of 100 students in the first year program and 100 in the second year, with a separate faculty of twelve teachers; a counselor and a director. The efforts on two campuses run at half this size, and local variations prevent things from coming out exactly even. In its second year, the project has touched the lives of approximately 2,600 students.

The total cost for the project the first year was approximately 4 million dollars, and for the second year over 5 million dollars. It is funded from a variety of sources, public and private. Sources included the Office of Economic Opportunity, several units of the U.S. Office of Education, the National Science Foundation, the Carnegie Corporation, and the Ford Foundation. The money provides stipends for students, salaries for faculty, allowances for the colleges, funds for special instructional materials, and money to support ISE. Continuation of the project depends upon yearly renewal by supporting agencies.

The Institute for Services to Education, which includes an academic staff called the Curriculum Resources Group, serves as a catalyst and a unifying force in moving separate institutions and separate funding agencies toward similar goals within a common framework. The professional staff consists of 16 people whose backgrounds and experiences are in academic scholarship, educational invention, and educational evaluation. The educational ideas in the program are further developments of those coming out of ISE's earlier work in developing innovative materials for pre-college programs for high school students going to Negro colleges.

The program starts from the fact that the present system of instruction is not working, and that answers do not lie in the direction of more intensive efforts along present lines. Instruction and learning are too mechanical. The teacher lectures and demonstrates, the student listens (supposedly) and repeats what he has heard and retained. This situation applies to all fields: English and mathematics, social science and natural science. And it applies to American higher education as a whole (of course, with great variations), not just to selected groups of colleges.

The purpose of the program is to provide teachers, through the eight-week summer conference, and reduced teaching loads during the academic year, with the opportunity to think about what they are doing and to share their new thoughts. Working together, they come to examine afresh what is worth teaching and how to teach it. The result is a new curriculum which the teachers themselves develop and teach. The colleges commit themselves to giving credit for work in this new program. As the program begins to show itself effective, the plan is to make the experience more generally available, to build bridges into the regular college program, working first with the first two years of college and then, hopefully, with the upper levels.

Elias Blake, Jr.
President, I.S.E.

Student Background and Achievement

The students in these fourteen Negro colleges (not just the project students) by and large are poor, from rural areas, and have parents with something less than a high school education. Here are some figures based on our own sampling of 3,534 students in September 1968 and 3,100 students in September 1967.

Thirty-four percent of the freshmen come from families with income of $3,000 or less. (Nationally, only 13.2 percent of the 1968 freshmen come from homes with an income of less than $4,950 according to figures from the U.S. Office of Education.) Sixty-five percent of the freshmen come from families with an income of less than $5,200; 7 percent come from homes with an income of over $10,000. (Nationally, 40 percent of the 1968 freshmen come from families with an income of over $11,580.)

Half of the students come from small towns and rural areas in the South, the sources of the congestion and social dynamite in the hearts of our major cities. Twenty-four percent come from towns of less than 2,500; 26 percent come from towns of less than 25,000.

Fifty-three percent of the parents have less than a high school education and 30 percent of the fathers went only as far as grade school, yet these families are producing college students.

In the two short years of the project, here are some of the things that are happening to the project students as compared to their peers in the regular college program.

1. About 70% of these program students have completed the second year of college (less than a 10% loss in the first year);

2. In ten colleges from which we have received achievement data on the sophomores for the first semester of this school year (the sophomores take half of their courses in the Thirteen College Program and half of their courses in the regular college program), we compared the course grade performance of students in the regular program with their peers in classes outside the special program. The grade-point-average for those in the Program was 2.30 while the grade-point-average for those not in the Program was 2.09. These students had not been enrolled in any regular college classes until this term. The regular college students had been enrolled in courses supposedly sequential to those taken in the sophomore year;

3. They perform as well or better than students in the regular college program on standardized tests (based upon pre and post testing in the first year of the program in which students within the program scored significantly higher – based upon co-variance analysis – than the regular college students on the composite scale of the ACT and significantly higher or no significant difference on the sub-test; comparisons from results of testing at the end of the sophomore year are being conducted over this summer). They still test below the national norms at around the 30th percentile. We are developing alternatives to these tests. Two first trials in math and science were used in the field this spring;

4. The program students view their college environment as more aware and intellectually and academically more demanding than their peers on the same campus. On the scholarship scale of the College and University Environment Scales, the ISE students rated their experience at the 37th percentile while the controls rated theirs at the 21st. Both groups are in the same colleges;

5. The program students (in comparison to the regular college students) show increased gain in personality-valuing measures – a sig-

nificant decrease in the valuing of support, a significant decrease in the valuing of conformity, a large, significant increase in the valuing of independence, and a holding in leadership while the regular college students decreased their valuing of this trait. The Survey of Interpersonal Values was used here;

6. The program students showed significantly less of a gain in anxiety during the first year than did the regular college students. The IPAT Anxiety Scale was used here.

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I. VOICES

Students Speak

(The comments on the program were transcribed from a tape recording. The poems appeared originally in a project publication.)

A FRESHMAN EXPRESSES SURPRISE

I must say that I was shocked at first to find as much freedom as I found in the class. The class was a typical class. There weren't any all bright students, or all slow students, and so certain students advance faster than others naturally. The program is set up so that the students that advance faster are allowed to do so, yet there is no discrimination between the slower students and the fast students. Each one is advancing at his own rate of speed and still learning. An example of this would be Math. Frankly, I'm not too particular about Math, but in the program I find it very enjoyable. One reason is that all through high school, Math was taught to me in one way: you are given a formula, then you work by that formula. In Math in the 13 College Program you are given a problem, not a formula and you try to solve it. Then you generalize that approach to other problems. That way you learn what you are doing and why. OK, the students that are slower go through this process, the students that are really majoring in Math are really interested and they have their own group – they meet separately. There is no discrimination between students and this I like. There is really a lot of freedom and this is also done in English. Overall, I really like this program.

Cloria Davis
Bennet College

A SOPHOMORE COMPARES REGULAR AND TCCP CLASSES

An instructor (in one of the regular courses) comes to class with a notebook in which he has written out the notes for September 15 through January 20, and generally has the same mid-term and semester exam. If you don't know what he's talking about, don't ask him, because he will put you down. I feel that this is terribly wrong. In sociology where there are about 3 TCCP students intermingled with the regular college program, we ask a question and everybody looks back as if to say, "what is she doing, is she a fool?" "Is she really real, we don't do that, you just don't do it here." After class we tell them that everybody should ask questions because no instructor knows everything, and that's what is wrong. They think they know everything, and if you question them, they may get mad at you. Then in the next class time, he will come in and ask you a difficult question that he's found somewhere in a book. I don't like that, but after all he had to go and get that question and he made me think.

Rachael Bussey
Alabama A & M College

A YOUNG MAN ON BEING BLACK

Nigger Cold

Cold wind biting,
  Chopping
    layers of skin,
Seizing half warm breaths,
  Clawing
    holes through toes,
Cutting dry bloody lips,
    Freezing watery eyes,
Stiffening bare fingers,
    Killing your very soul.
That's what I call Nigger cold.

I Love My Skin

I love my skin – I
Love my skin.
It's tight and smooth and
Burnt and Black.
It's tough
And covers a big strong back –
Let's you know
I takes no slack.

Come on out your pocket, Slim.
I'm not 'fraid of you no more.
Cut my skin, cut it, Slim.
I'll fill you up,
Damn buttercup –
Fill you full of mighty iron.
Time has come you wake up, man,
To the fact that
Tom is dead. Dead, Charlie – Tom
is dead.
Tom just died when I saw my skin.
My skin – Charlie, my good black
skin.

I love my skin,
So permanent, you know – my skin
And me – me and my skin
What I want you to realize
Is – I love my skin.
It's really nice.
It's
Tight and smooth and
Burnt and Black.
It's thick, man,
Covering a big strong back.
Not like yours –
Such Soul you lack,
It lets you know –
I takes no slack.

Sensing The Blackness

I hear the cry of black.
Moaning. Suppressed.

I see the festered flow of life
Smothered in a gray
Shadow of ignorance.

I hear the cries of moaning mothers
Hovering over their dead black sons.

I sense the Blackness.

I see the young man intimidated
For the wish of awakening His people.

I see the zealous young striver,
Wanting to learn,
Stamped and trampled.
Deprived. Shot.

I sense the Blackness.

I smell smoke.
I sense change.

Charles Mann
Alabama A and M

A Teacher on Teaching

(Teachers in the program wrote reports at the end of the second year describing some of their experiences. The next three selections are excerpts from these reports.)

In general, the teaching practices of the school's regular program are strict, authoritarian, rigid, outdated, and stale. I too, find these faults in my own teaching from time to time, or more honestly, quite often. This is because I am a rather rigid person. On some days I make little or no effort to overcome this flaw in my personality. And there is no getting around the fact that personality plays an important role in anyone's teaching technique.

When a student flatly contradicts me I often feel a wave of resentment rising in me. When I feel this happening I cannot escape the fact that authoritarianism is in me, even as it is in those I try to correct by example. I don't believe in it, but it is in me. I also catch myself giving dry, bully lectures . . . because I have ideas and I want people to hear my ideas and be influenced by them. So that's in me too.

On days when I am bored or troubled my mood infects the rest of the class. When I use the Chamber Theater Technique I tend to direct a bit too much. I can only hope to correct this fault through practice and concentration.

In addition, there are certain gaps in my professional preparation that handicap me before a class, for example, I have never mastered the essential rules of spelling, which is no doubt evident in this report. A gnawing insecurity about one's competency usually leads to further authoritarianism.

I give students what sometimes feels like a large part of my spare time. But I enjoy being with students, and to a degree I can't help it, so I suppose I am disqualified from being able to call this one of my teaching "techniques." On a perfect day I can think on my feet, encourage discussion, slyly introduce new ideas, show both sides to a coin, etc. . . . if the conditions are right.

IF I don't feel ill.

IF it is not such a sunny, fine day that everyone would rather be outside.

IF I don't get a message that interrupts my train of thought.

IF the class is not distracted by the sounds of construction work.

IF a large number of people don't enter the classroom late.

IF I am not worried over personal problems.

IF people feel like talking and thinking.

IF I feel that I have a complete grasp of the material I am teaching.

And many more if's.

So far as technique is concerned, I find I have no machine-like formula that can be expected to work the class into a frenzy of intellectual curiosity more than once in a great while. I play it by ear, borrowing from the other teachers ideas, devices, techniques. And with every technique that a teachers throws away, he throws away some small part of himself, for, afterall, everything seems like such a good idea at the time. Innovation is constantly throwing one's self-esteem out the window. This is a costly mental exercise, and its dividends have, from time to time, been greatly exaggerated.

What effect has the project had on me? I can answer this best by taking a close painful look at what effect I have had on the students, for if anything so huge and cloudy as "the project" is to share the praise for my infrequent good for-

tune, then it must also bear a bit of the blame for my failures.

I would not be suprised if I were to discover that I have spent a good part of the year in the pose of God's gift to students, partly because of the demands of my own professional ego, and partly because of the scholarly-sainthood posture of the project. I was in a constant state of distress because my students could not seem to fully appreciate how blessed they were to be at the tender mercies of a dynamic New Breed teacher, girded with innovative ideas and armed with magic units. It was difficult not to be authoritarian, because some gnawing insecurity in me craves authority. After my relationships to students began to take on the dread stain of actual humanness I began to find it impossible to speak of them in strict clinical terms, knowing all the while that the project depends heavily on each teacher maintaining professional distance from the young minds in his charge.

If most of my students were asked to evaluate our relationship over the past year, they would use as their evaluative instrument that degree to which I was not as repugnant as the very worst teacher they have ever had. Applying this instrument, they would conclude,(I dare to be confident to say) "Mr. Wilmore. He wuz nice." So there you have it.

And so, through this project I came to learn that a teacher is no more than a house, haunted by the ghosts of student's minds. As I read over the slick pages of my C.R.G. units, I hear these ghosts whispering to me their bitter condemnation. One turns out lights, blows fuses, in the minds of students - a captive, the most captive of all captive audiences. One becomes too sure of himself, too confident; one makes mistakes; one becomes rigid and stubborn in spite of one's self; one becomes petty, rude, revengeful, artificial, wordy.

I cannot pat myself on the back, for fear my hand, knowing better my shortcomings and errors would strike too hard . . . and draw blood. This evaluation has drawn blood. I had intended to flatter myself. Of course I realize that the very act of bleeding across this sheet of paper may be an act of self-flattery. A strange condition - a teacher must battle his self-centeredness more than anyone else must. But the act of teaching is an act of bravado and exhibitionism. His ego overtakes him, overpowers him, and throws him violently to the ground. But the price of the defeat is paid by students.

A valid question might be asked at this point. How much time did I devote to being "nice?" I devoted a great deal of time proving myself at least not as bad as the very worst. Like many people, I crave affection and respect, and so there is no telling how this need influenced my every word in the classroom, my every slightest gesture, and even my most harmless mannerisms. Reaching out in the darkness to establish human contact, every now and then our minds gently bumped with a spark and a rewarding electric shock of recognition, but more often we passed each other in the night.

The project taught me guilt. The condition of being guilty is certainly what I learned most deeply this year. Never before were the common mistakes of teaching techniques pointed out to me so forcefully. After the long hours of the Summer Conference I felt that I had learned by heart what a poor teacher smells like, looks like, acts like, speaks like, and teaches like. So why did I have to gain all this terrible knowledge all at once? Like Adam, once I had tasted of this strange fruit I no longer had an excuse for error. I was naked.

I reasoned, "Now that I know what all the common mistakes are, I shall never make a common mistake." But I made many, many mistakes. And they were very common. Then I would ask myself, "Why did you do that? You knew it was wrong, didn't you? You can no longer say that you did not know, because you were told this summer!" And I would have to admit that I made the mistake because I am weak. Weakness . . . those little flaws in judgment, those fatal cracks in the mind's structure, those ego games that trample the voices of others, gradually undermined my confidence in the sacredness of my mission.

I am sorry to say that the examples in the Guide for Teachers don't even begin to plunge to the murky depths of what happens beneath the surface tension of a classroom. The outcome of any particular classroom activity depends largely upon ability to control his perception of it on the lower levels of the mind. To demonstrate how this works in my own classes I must invent my own form for telling the story. Conversation only skims that utmost surface of our souls. The real drama, and therefore the real truth, of any

personal encounter lies much deeper, past the countless folds of pretense and facade. The strongest thermometer for the white-hot heat of a classroom is those peculiar slight motions beneath the level of speech and questions and answers. The most telling sights in a classroom are always seen out of the corner of the eye.

So I have invented a form by which I can reconstruct how these below-surface motions influence the learning process in my own classes. The important thing to remember when reading the following description is that the teacher's role in a classroom activity is more threatened by what he leaves unsaid than it is by what he chooses to say. The performance in the classroom hinges on to what degree the unsaid gets in the teacher's way, and trips him up.

Thoughts not spoken are in bold type.

"A poem by our friend, Langston Hughes today. **Teaching it is only polished name-dropping.** This poem, as you can see, is called "Baby." **(But I can't stand it when people say 'as you can see' to me.)** What we **(the royal we)** would like to do today is have everyone read this poem outloud, starting from this side of the room. **A– walks in late, as usual. Kill . . . forgive. Today I am Jesus. Start all over again. No. Somebody talking in back of the room. That's supposed to be good. Hurts my pride. Listen to me! Listen to me!** NOW, does everybody have a copy of the poem? Yes, B–, we are each going to read the poem outloud. **Voice, voice, Lee Sharkey's summer workshop.** Try to read it the way the voice of the person speaking in the poem would sound. **Blank faces.** Student F–, read. **(I command you!) . . . He has a whipped voice. He has a black voice. Black voices are whipped.** That word is "over." Why do you think the poet spelled it, "ovah?" **Good question, Wilmore buys his way into paradise.** That's right! Read on. NOW, would the person in the poem sound like that? Why not? **That's right, Student G–, rip your fallen comrade to shreads. (He would not have fallen if I hadn't pushed him.)** Okay, Student R–, do you want to read the poem now? **That do-you-want-to wouldn't fool an idiot. Go ahead. He can't read. I can't teach him to read. Brother, who did this awful thing to you?**

"Okay, Student T–, read the poem. **She calls me Mr. Steve. Mistah Steve . . . my people. Soft voice, beaten voice, black voice.** Okay, why did you read it that way? **(Why doesn't one of them say, "Because that's the only way I know how to read it, you middle-class missionary jackass!"?) . . . Student H– has a deformity. The others laugh at him helpfully, gently. Should I?"**

To shorten the description, let us now assume that each student in the class has now read the poem. We are ready to begin classroom discussion.

"Do you think the narrator in this poem is a man or a woman? Okay, why? What do you think? An older woman or a young woman? What makes you say that? **Lovely legs, Professional Distance, Wilmore . . . Mistah Steve.** Yes, this is a very simple poem. Langston Hughes did not have to go far to find the subject matter for his poetry. He found it in all of the black life around him. He . . . **YOU ARE GIVING A LECTURE. SHUT UP!** Have you ever heard anyone talk this way? **Drawing from the student's own background, C.R.G. would be proud of me now.** When did you hear someone talk that way? What kind of voice did they have? **Was that another one of my stupid questions?** Yes Student Y–, go ahead. **Haltingly, slowly. Can't speak. Can't write. Brother, who did this awful thing to you? . . . and why?"**

Now, and only now, can I begin to evaluate what is going on in this classroom.

The class response to the poem, "Baby" by Langston Hughes was:

good _____

bad _____

fair _____

Indicate one of the above.

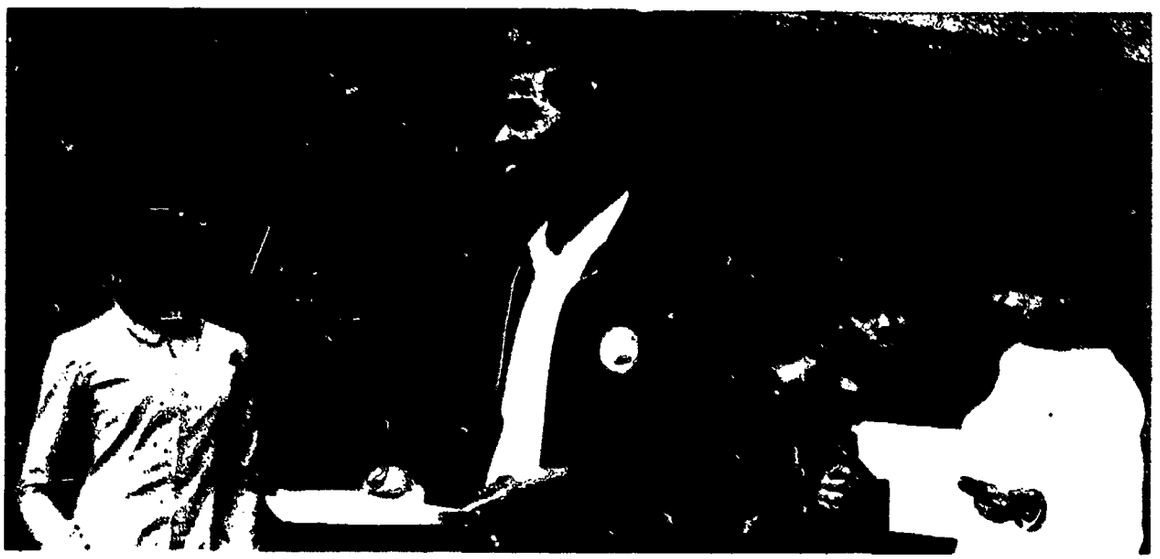
I have tried to demonstrate the shortcomings of this type of evaluation. In all likelihood, the use of Hughes' poem did not "work," nor did it "not work." It gave the students practice in reading aloud, to hear some voices not their own. No faces suddenly beamed with profound understanding. No one reversed the 12 year-old pattern of incorrect and criminal education.

Some students showed interest. Others faked interest. There was talk, and frustration, and microscopic triumph, and laughter. "It wuz nice."

One of the problems with evaluation under these circumstances is that one is greatly tempted to oversimplify, to speak in terms of "student goals," "evaluation instruments," etc. We should force ourselves to take into consideration the countless subtle variables that influence any single class on any particular day. Where is the unit that can tell me how to handle a discussion on death when there is a student in the room whose father has just died? Where is the unit that can tell me how to lead a talk on love before a class socially controlled by a block of co-eds who happen to be homosexual? Where is the unit that can teach me how not to come on blacker-than-thou when we wind up talking about our place in the Black Liberation Movement?

Oversimplification of the problems that face teacher and student parades itself in reports such as this as "objectivity." It is, in fact, an easy way out. More often, it is a cold-blooded lie of dangerous proportions.

Stephen Wilmore,
Mary Holmes



A Biology Teacher on the Chick Project

The chick project was first designed to see the changes in secondary sex characteristics resulting from testosterone treatments. After reading our first scientific paper (The Transplantation of Testes by A. A. Berthold), the first semester, the students became interested in caponizing chickens, transplanting testes and observing primary sex characteristics, as well as any other changes.

These animals were delivered in class so that the students handled them, cared for them before they were used in the classroom. They learned their life cycles, some social behavior patterns and information about the animal that would not come up in a classroom generally.

The fifty students take part in initiating the project. They cleaned cages, placed wing bands on the chicks, separated them into three groups, the injected, the anointed and the controls. They fed, weighed and measured biological changes in terms of size, color, texture of organs (feathers, skin) sounds, voice and behavior. The interested students treated the chicks daily, all students had to make daily observations and keep records. The mathematical analysis of the results would be based on these records.

At first it took two days to treat the chicks. Last week the seventy chicks were cleaned, treated, fed and records filed in one hour. They developed skill in injecting, anointing, keeping the animal comfortable so that it can be weighed in a short period of time, operating on living animals (several chicks were caponized and organs were transplanted without the chicken becoming sickly).

(In other laboratory periods the student prepared onion, untreated oat and irradiated oat root tips. They made beautiful squash smears to study Mitosis. The other teachers in our department though the smears were very good. The students did not find many mitotic figures the first time, so they asked to repeat the experiment. We are growing more root tips now. The students apparently enjoyed our laboratory activities.

In our regular program, mitosis is studied using fixed slides and movies.)

One day, two injected chickens were slightly dazed after the treatment. One student asked, "These two chickens are sick; they cannot get air." The chickens were placed in separate cages and then I asked, "How could we determine whether or not the chicken was getting enough air?" One student said that we could compare his breathing with that of a healthy chick. Then I asked, "How much is enough air?" After much discussion a young lady found the experiment on respiration in the BSCS. We usually do that experiment using a mouse, a hampster and a frog. This semester we will also measure oxygen consumption and carbon dioxide evolution using the chick.

One student was cleaning the dropping trays for solid waste in the chicken cages. He said, "Mrs. Clark, I noticed that the chickens have a lot of solid waste but the paper under it is dry for the most part. How do they get rid of liquid waste? The body is covered with feathers so very little evaporates." I answered, "Boy! I'll have to look that up. Check the excretory system in Helena Curtis." I knew that she made a short statement about birds that would answer his question. He forgot to look up the information, but when we started the excretory system, and reference was made to birds loosing ammonia in the form of crystals of uric acid, he started discussing the project again. One girl said, "They gave off so much thin pasty solid waste while we were weighing them that in proportion to size, "I'll bet they give off as much liquid as I do." We spend a part of each lab period discussing the project.

These students have a great sense of arriving at principles but will not read very much to check their observations This semester they have a

greater sense of responsibility. Last quarter, frequently I did a lot of the work. This semester, after they learned how, I only had to check the chicks on the weekends.

Several students asked what happens to the ovary of the hen when testosterone is injected, or to the primary sex organs in general. Could we transplant some of the organs, or caponize some roosters? What would happen if we soak some eggs in the hormone before we hatch them?

One student noticed that some chicks often gasped for breath immediately after injection. A good discussion followed concerning the proper method of holding the chick for injection, the possibility of shock caused by the chemical, the chick could not get oxygen, how much oxygen is enough?

As a result of these questions we extended the chick project to transplanting testes in hens, caponizing roosters, studying the gonads of hormone treated chicks, using the chick in our experiments on measuring oxygen consumption and carbon dioxide production. Next week we are to soak some eggs in the testosterone solution before incubation, and then we will study the two, three and five-day-old embryo.

Elizabeth Clark
North Carolina A & T

A Math Teacher on Discovering the Binomial Theorem

In the first semester one of the classes discovered the binomial theorem in an accidental way. At the time we were not aiming in that direction: although the problem of generalizing Pascal's triangle had been posed several times earlier (i.e., in set theory). We had played "Guess My Rule" in developing the concept of function domain and range, but many of the students were not satisfied with the hit or miss strategy of determining the rule; harder equations were almost impossible.

Thus we developed the Method of Finite Differences as a systematic way to guess rules. We constructed generalized finite difference tables for polynomials of degree one, two, three, four, and five. It was during discussion of a polynomial of degree n, i.e.,

$$y = ax^n + bx^{n-1} + cx^{n-2} + \ldots$$

that one student (student A) must have been reminded of the expansion of $(a + b)^n$ because she inquired whether or not the Nth degree poloynomial didn't have anything to do with "a's and b's raised to powers." Her questions were so vague that at first I thought she was confused about what I had written on the board. But in order to get clear about what she was asking I tried writing $(a + b)^2$, $a^2 + 2ab + b^2$ on the board.

Student A: Yes, I think that's right.

Instructor: Well how about $(a + b)^3$?

Student A: Yes.

Instructor: Is this what we were doing over there? (Nth degree polynomial).

Student A: I don't know.

Instructor: Can anyone say what $(a + b)^2$ is equal to?

Student B: Yes, $a^2 + 2ab + b^2$.

Student C: Isn't it also $(a + b)(a + b)$?

Instructor: Yes, can you multiply it out?

Student C: $a^2 + ab + b^2$.

Student D: No, you have a ba term which is the same as ab, so its $a^2 + 2ab + b^2$.

Instructor: Right, how about $(a + b)^3$? (pause)

Student B: $(a + b)(a + b)(a + b)$, but I don't know how to do three of them.

Instructor: Why don't you try two at a time?

Eventually, we got $a^3 + 3a^2b + 3ab^2 + b^3$, and we also got expansions for $(a + b)^4$ and $(a + b)^5$. I wrote $(a + b)^1$ on the board and reminded the class what "raised to the first power" meant. Then I rewrote the expansions in order from $(a+b)^1$ to $(a+b)^5$ and asked if anyone saw any patterns.

Student C: Yes, look it's Pascal's Triangle: 11, 121, 1331, 14641.

Instructor: That's funny. Pascal's Triangle arose in set theory before.

Student F: Does this have anything to do with sets?

Instructor: It might. If this is Pascal's triangle, can anyone tell what $(a+b)^6$ will be?

Student B: I notice that the powers of the a's go down and they go up on the b's. It has to go $a^6 + a^5b + a^4b^2 + a^3b^3 + a^2b^4 + ab^5 + b^6$.

Instructor: What about Pascal's Triangle?

Student B: Oh yes, $a^6 + 6a^5b + 15a^4b^2 + 20a^3b^3 + 15a^2b^4 + 6ab^5 + b^6$.

Eventually we also noticed that the sum of the exponents of a and b were always the same for all the terms, and in fact the sum was equal to the exponent of (a+b). Earlier I had asked them to try to generalize Pascal's triangle. In terms of power sets the question had been asked, "If a set

has N elements then how many subsets have zero elements, one element, two elements, etc." This was the general question which was asked after we had answered it for specific values of N and gotten Pascal's Triangle. We had gotten the answers for zero and one element in the general case. We had come back to the question with the method of finite differences and gotten the answer for sets of two elements ($\frac{1}{2}n^2 - \frac{1}{2}n$). Every time, however, the question was left open when no more progress was apparent. At this point in the discussion of the expansions of (a+b) I asked about $(a+b)^n$ However, the class did not get very far. The problem was the same as trying to generalize Pascal's Triangle. However, then another student asked a question.

Student G: Is there some way to go from one term to the next?

Instructor: Can anyone see any way to go from one coefficient to the next?

Student B: I think I see a way . . . No, that won't work.

Student C: I've got a way. You take the 6 from the a and it becomes the coefficient of a^5b. (We were working with the expansion of $(a+b)^6$. Then . . .

Instructor: Would you like to write it on the board?

Student C wrote: $a^6 + 6a^5b + 30a^4b^2$.

Several Students: How'd you get that?

Student C: I took the 5 from the a and multiplied it by the 6.

Student B: But that's not correct. (But Student C was writing on. She had $\ldots + 30a^4b^2 + 120a^3b^3 + \ldots$)

Instructor: Can you state a rule for what you are doing?

Student C: To get the next coefficient take the last number (coefficient) and multiply by the exponent of a. (which I wrote on the board).

Instructor: Look at Pascal's Triangle. There it says 15, not 30.

Student C: Oh, well let me sit down. This is all wrong.

Instructor: Stay up there, you are not that far off. Can you change your rule? Can you do anything with the 30?

Student C: $a^6 + 6a^5b + \frac{30a^4b^2}{2} + \frac{120a^3b^3}{3} + \frac{360a^2b^4}{4} + \ldots$

which gives,

$a^6 + 6a^5b + 15a^4b^2 + 40a^3b^3 \ldots$

Instructor: What's the rule now?

Student C: To get the next coefficient, take the last coefficient. multiply by the exponent of a and divide by the number of the term. To get 15 you take 6 multiplied by 5 which is the exponent of a, and divide by 2. That gives you the third number.

This was essentially it. She ran into problems because as she proceeded to generate each coefficient she used that part in the numerator to generate the next coefficient. The class noticed that she still was not getting the right answers. I asked her to follow her rule more carefully. Then she began getting:

$$a^6 + 6a^5b + \frac{6x5}{2}a^4b^2 + \frac{\left(\frac{6x5}{2}\right)x4}{3}a^3b^3$$

$$+ \frac{\left(\left(\frac{6x5}{2}\right)x4\right)x3}{4}a^2b^4$$

$$+ \frac{\left(\left(\left(\frac{6x5}{2}\right)x4\right)x3\right)x2}{5}ab^5 + \ldots$$

which we reduced to:

$a^6 + 6a^5b + 15a^4b^2 + 20a^3b^3 + 15a^2b^4 + 6ab^5 + \ldots$

Once everyone had grasped the pattern of generating the coefficients we applied the rule to $(a+b)^n$.

$$n, \frac{n(n-1)}{2}, \frac{\left(\frac{n(n-1)}{2}\right)(n-2)}{3}, \text{etc.}$$

Student C succeeded in spotting a pattern for generating the coefficients of the binomial expansion. I asked her later if she had ever seen the binomial expansion. She said she thought she had, but she really didn't remember it. It did not look like what we had discovered. The following day we worked some more with the coefficients and simplified them. It was hard to convince them though, that . . .

$$\frac{\left(\frac{\left(\frac{6\times5}{2}\right)\times4}{3}\right)\times3}{4} = \frac{6\times5\times4\times3}{2\times3\times4},$$

and I wish we had perhaps done the unit by Jack Alexander (of the CRG staff of ISE) on continued fractions before this. But, as it was, I tried to tie in what the class discovered with the usual form of the binomial expansion:

$$a^n + na^{n-1}b + \frac{n(n-1)}{2}a^{n-2}b^2$$

$$+ \frac{n(n-1)(n-2)}{2\times3}a^{n-3}b^3 + \ldots$$

or

$$(a+b)^n = \sum_{k=0}^{n} \frac{n!}{k!\,(n-k)!}a^{n-k}b^k$$

The whole discussion might not have taken place had I ignored student A's question and had gone on with what I had been discussing with the students. The students saw at the end that they had also solved the standing problem of generalizing Pascal's Triangle. If this is not enough to convince one of the value of flexibility to pursue questions and directions brought up by the students then one must be completely solidified. Throughout the year, other things have occurred of this sort, but none as spectacular as the discovery of the binomial theorem. I do not know if it will happen again next year in that way; the essential point is that the classroom must be open for such developments whenever they are ripe to occur.

Roger C. Ingraham,
Bennett

Project Directors on Chances for Change

(The program on each campus has its own director. These are excerpts from reports by the directors offered in the middle of the second year describing the influence of the project on the regular college program.)

CLARK COLLEGE

"The innovative techniques . . . are gaining the attention of the Biology Department, a department which felt during the first year . . . the Thirteen College Curriculum Program (TCCP) could not compete with their sophomores. An experimental design is being planned to determine at semester end the relative merits of the TCCP course and the regular course.

"Partly through the influence of this program, there is new debate on the future of the three courses comprising the freshman English sequence.

"From findings from within and without the program . . . (the Faculty Committee for Curriculum Revision) is making recommendations . . . that an associate dean be appointed with responsibilities for the entire general education curriculum.

"It can be stated with considerable assurance that we will matriculate 70 percent of the program students into the junior year while the regular program has displayed in the past three years . . . a rate of about 50 percent." (This is with students doing half their work in the regular college in their second year.)"

ALABAMA A & M COLLEGE

"The Division of Education has made plans to have teachers in the curriculum program demonstrate techniques of teaching employed in the program to students in basic education courses. Regular faculty meetings will continue to feature discussions of the several facets of the Curriculum Program followed by question and answer periods.

"The program seems to have generated a healthy spirit of competition . . . Since the publication of "Output" . . . creative writing and research by curriculum program students, the English Department has begun a major effort to have students in the regular program publish their work at intervals.

"The Chairman of the Department of Social Science has promised to adopt our freshman course as the course for all college freshmen in the 1969-1970 academic year."

BENNETT COLLEGE

"Certain degree requirements have already been given close attention and are up for serious study as we await the outcome of courses taught in the program. Other teachers are now making wider use of relevant materials through paperbacks and contemporary writings, equipment such as the overhead projector and other aids.

"In Mathematics where there is generally a high percentage of failures, not a single girl received a failing grade . . . instead there is evidence of an increased interest in the subject.

"The TCCP is seen at Bennett as a revision to continue over a period of years, as we examine and change our academic offerings. The Curriculum Resources Group (of ISE) has worked with the teachers in emphasizing a sense of liberation from predetermined curriculum from textbooks, standard assignments, and formal methods of presentation."

BISHOP COLLEGE

"Polite skepticism . . . (from) Departmental Chairmen has been dissipated by the undeniable changes in behavior of the program students. Similar changes have not occurred in non-program students.

"In Biological and Physical Sciences, there is an intimate sharing of materials and teaching experiences.

"Presently ways and means are being sought for the implementation of our methods of developing curricular materials and the pedagogic techniques employed . . . institutional plans include a plan to implement some aspects of the program into the regular freshman curricular next year."

FLORIDA A & M UNIVERSITY

"The Department of Mathematics has established two classes in mathematics which use the innovative methods of the TCCP . . . (also) Four classes in English are being taught in the regular curriculum using the materials. (These are trial runs with teachers not in the special program.)

"The G.E. Time Sharing Computer is a part of all freshman math classes. (This was first viewed in the TCCP.)

"The library and bookstore are undergoing a transition . . . paperback books are being purchased so that students can have access to them . . .

"The TCCP will provide Florida A & M . . . with sufficient supportive evidence to convince the Board of Regents that a Basic Studies and Development Service will be a more realistic approach to solving the ills of students . . . (Since 1961 no real progress in persuasion has been made.) Basic Studies will be a two year program for all students. The TCCP will serve as a curriculum resource for the university in orienting the regular faculty to the intimate details of new curriculum designs."

JACKSON STATE COLLEGE

"(we have) . . . been a victim of cultural and educational lag in contemporary knowledge, educational theory and up-to-date content . . . The TCCP has made thrust in changing this picture . . . teachers in the college who are not connected with the program . . . visit classes (and) use curriculum materials and plans. The indication is that the methods used and content taught in this experimental program will be adopted to a greater degree in many classes of the regular college.

"The association of Jackson State with 12 other colleges . . . has brought about these benefits: Teachers have gained new insights into curricular planning, psychological handling of students with backgrounds different from their own and changed old attitudes about the abilities of the students."

LINCOLN UNIVERSITY

"The . . . TCCP grant for curriculum development permitted Lincoln University to experiment with some of the concepts of innovation that had been discussed over a period of two years. Until Title III funds were provided, it was not financially possible to implement these ideas.

" . . . all students are taking four courses patterned after the TCCP experiment . . . All freshmen are in a humanities course like the TCCP curriculum . . . Freshmen can elect a mathematics course structured like that in the new curriculum.

" . . . the success of the innovations used last year and thus far in the fall semester of 1968 . . . encourage the faculty to believe a third year . . . will permit the weight of solid experience to reinforce the . . . new approaches."

NORFOLK STATE COLLEGE

"The high interest on the part of the administration in the program is evidenced by the fact three non-program faculty members were sent to Tufts University to observe curriculum development in action . . . one English teacher spent several weeks . . . while one teacher each from the physics and mathematics departments observed the conference for one week.

"The Mathematics Professor has had for some time an interest in developing a freshman curriculum . . . and is presently in the process of developing a proposal . . . through ISE to the ESSO Foundation in order to begin earnest efforts in that direction." (He secured the grant for release time.) "In addition, the program biology teacher was recently asked to work cooperatively with a non-program colleague in the development of a course in Biology." (Also the Chairman of the Biology Department of Norfolk, a former National Science Foundation Staff member, worked full-time in the summer conference thus benefitting all the schools.)

"Given the anticipated impact of the TCCP on the college, the impetus it will afford to make substantial changes . . . at all levels of the college program is very great."

NORTH CAROLINA A & T STATE UNIVERSITY

"Ninety-three percent of these young men and women completed the first year demonstrating the holding power of the program . . . (this) has brought about exploratory efforts at curriculum revision by colleagues not associated with the program.

"Our students created quite an impression with their intellectual curiosity and ability to program and carry out activities without supervision . . . Several Deans commented favorably on the healthy stabilizing body . . . The Dean of Students believes . . . the program made its greatest impact in providing goals for others to shoot at.

"The expanded use of materials and methodology . . . is planned by video taping the program in action for viewing by the general university and the exchange of teachers and students in classes and the exchange of teacher made examinations."

SOUTHERN UNIVERSITY

" . . . The first order of business is to build a channel through which the personnel of the two programs can interact . . . we are employing the mechanism of cross visitation. A major effort for the 1968-69 school year is to effect a rather intricate involvement of department heads in the program.

" . . . An assembly at which the principal speaker was the Vice President for Academic Affairs . . . identified the TCCP with the entire university community and laid the basis for a coalescing of goals."

TALLADEGA COLLEGE

"The TCCP will be increasingly vital in its proposed third year since changes suggested by certain success in the program will demand implementation as well as further experimentation and evaluation.

"In plans for the current year are discussions for the possible usage of the TCCP freshman Social Institutions course as the regular freshman Social Science course . . . Exploration of this possibility and the means for accomplishing it will be a major project . . . this year.

"On an informal basis, material from the Mathematics course has found its way into the Freshman Mathematics Program.

"Title III funding is being sought next year to develop both the college's cultural enrichment program and its placement service and the latter is a direct result of efforts put forth by the TCCP counselor. Indeed, under the guidance of this administrator, student services are being . . . reorganized to improve . . . personal counseling and guidance; advisory services for student organizations; and career counseling and placement."

TENNESSEE STATE UNIVERSITY

"In some cases we expect the regular faculty will feel it necessary to strengthen their courses so they will be prepared to meet the higher intellectual expectations of the TCCP students.

"The third year is perhaps the most crucial; the immediate plans call for incorporation of the findings of the curriculum project into our regular freshman program. Accordingly, changes will be made in the junior and senior year courses as necessary to accommodate the academic needs of the students."

VOORHEES COLLEGE

"The first one hundred students are now causing staid and traditional teachers to re-evaluate their long accepted views of education. This is due to three factors: (1) of the 100 students admitted to the TCCP in September 1967; 95 returned in September 1968. None of the five who left the program did so for academic reasons . . . (2) it has been established as a fact that more students of the TCCP ask more questions and volunteer more answers than the students in the regular college at any class level . . . (3) they are bringing relevant and related knowledge to the classroom far beyond required assignments. They are asking inquiring knowledgeable questions."

II. SAMPLES

From the "Love" Unit

(This is an excerpt from the section on D. H. Lawrence's "The Horse Dealer's Daughter," which is one of several sections that make up the Love unit which, in turn, is one of a number of units that make up the freshmen English course.

The excerpt refers to Chamber Theatre. This is a technique for dramatizing fiction. In a given passage, the students distinguish the various characters and points of view, assign them to different students to read, and then act out the passage. A character may possess more than one point of view and hence be represented by more than one actor. The author may also have a point of view and hence be represented by a separate actor. The need to make such distinctions and assignments, and then see how things work out in a performance, focuses the student's attention on the problem of point of view and other matters in fiction. For additional information about Chamber Theatre technique see Carolyn Fitchett's CRG unit by that title.)

Materials: "The Horse Dealer's Daughter," D. H. Lawrence, in Short Story Masterpieces, ed. Robert Penn Warren and Albert Erskine; Dell, $.95.
Supplement: Sample Chamber Theatre Script (for the teacher)

To the Teacher: "The Horse Dealer's Daughter" is, among other things, a study of the manner in which mute emotions force themselves through a variety of cultural and social barriers into awareness. As such, Lawrence's short story can provide a gradual lead-in for an extensive study of O'Neill's Desire Under the Elms. The subtle and inarticulate forms of tension revealed in Lawrence's tale can be contrasted with the dramatized violence in O'Neill's play, and the emotional power that emerges from the tone and pace of each work compared. Student discussions of instances in which cultural limitations or acquired attitudes compel people to express themselves irrationally or awkwardly may lead the class to insights into the restrictive setting of each plot and make the action and motivations of the characters more understandable.

Suggested Procedure: Basic to the development of "The Horse Dealer's Daughter" is the role of the omniscient narrator: his intelligence and his awareness of the attitudes, thoughts, and sensual and emotional vitality of the characters. The narrator knows more about the emotions and motivations of the people concerned than they themselves do. One way of getting at the reason for this is to have students analyze passages for Chamber Theatre demonstrations and thus show explicitly how the author uses an omniscient narrator as a device for revealing the private worlds of the characters.

Have students read the first three pages – to the end of the fourth paragraph on page 253: "He pushed his coarse brown moustache towards off his lip, and glanced irritably at his sister ..." Then divide the class into two groups and let them handle the interpreting of a scene from these three pages in Chamber Theatre style. If the students have had previous experience with Chamber Theatre, you need not make any suggestions to them; if the technique is new to them, say a little about dramatizing with the narrator as a participant, but let students discover how it will work before explaining more. The value of having students use the technique before discussing the story is that they will be forced to confront on their own those elements in the narration that give an insight into Lawrence's characters and theme.

Much of the selected passage is summary on the part of the narrator, who is establishing the setting and introducing the characters. The value of a Chamber Theatre presentation, therefore, will be in demonstrating narrative shifts of focus (narrator's movements) from one character to another, from scrutiny of the over-all scene to a particular event (moving horses). Toward the end of the passage, however, lines should be shared between narrator and character to indicate the sharing of thoughts.

Have the two groups present their scenes to the

class. Afterwards, encourage students to discuss the differences between the two presentations and the elements in each which seem most justifiable in light of the passages read. What is the narrator's attitude toward the characters? How can you tell from the passage? Which presentation gives the better indication of the narrator's attitude? What tone of voice is appropriate for the narrator? Which presentation used the more appropriate tone of voice?

A comparison should be made of the characters, tones of voice, attitudes, narrator's positions and movements in the two versions. Have students refer to the story for evidence of certain actions and attitudes. Many indications of the narrator's tone of voice and attitude toward the characters are to be found in Lawrence's descriptions of the family. For example (underlining is used here for reference):

> The three brothers and the sister sat around the desolate breakfast table, attempting some sort of desultory consultation. (p. 251)
>
> . . . There was a strange air of ineffectuality about the three men, as they sprawled at table, smoking and reflecting vaguely on their own condition. (p.251)
>
> . . . Joe, the eldest, was a man of thirty-three, broad and handsome in a hot, flushed way. His face was red, he twisted his black moustache over a thick finger, his eyes were shallow and restless. He had a sensual way of uncovering his teeth when he laughed, and his bearing was stupid. (p. 252)
>
> . . . Then, with foolish restlessness, he reached for the scraps of bacon-rind from the plates, and making a faint whistling sound, flung them to the terrier that lay against the fender. (p. 253)

Would the tone of the narrator be one of sarcasm, deprecation, sympathy, humor, indifference?

Were the students' Chamber Theatre presentations consistent with the characterizations given in the passage? Let the class discuss ways in which the presentations might have conveyed more of the spirit of Lawrence's characterizations, and some of the crucial moments with this end in mind.

. . . [Later] confrontations of Mabel and the doctor – at her mother's grave and at the pond – may be presented by a student director interested in the characters' introspections and Lawrence's narrative technique in presenting them. (See Supplement for sample Chamber Theatre script.) What is significant, if anything, about the place where the doctor sees Mabel each time? What do her thoughts and activities at these times tell us about her past? her present state of mind? What does her strong adoration of her dead mother indicate about her? Why would Mabel feel "secure" among the graves? Is there anything in this or other passages which shows her intention of escaping reality? There is a careful attempt in the story to build up systematically the sense of Mabel's isolation from any contact with men or women – in other words, from life. When do you first detect this isolation? When does the reason for it become apparent? Is Mabel's isolation, and consequent silence, through deliberate choice or through circumstances?

The doctor's reaction upon seeing her in the cemetery is equally significant. What is learned about him at this confrontation? Note the effect that Mabel has on him at this time:

> He had been feeling weak and done before. Now the life came back into him, he felt delivered from his own fretted, daily self. (p. 260)

What does his reaction indicate to us about the future development of the story? The doctor is not aware of his feelings at this time or the meaning of this reaction, yet the omniscient narration of the story makes it possible for us, the readers, to know and interpret his inner feelings. Why are we told more of the characters' emotions than they themselves are aware of? Is it necessary for the development of the story for us to have this advantage?

THE HORSE DEALER'S DAUGHTER

CHAMBER THEATRE SCRIPT EXCERPT, PP. 259-260.

The characters are Mabel, Narrator, and Dr. Fergusson

MABEL: (KNEELS AND BEGINS CLIPPING GRASS, ARRANGING FLOWERS, BRINGS WATER AND SPONGES HEADSTONE, ETC.)

NARRATOR: Carefully she clipped the grass from the grave, and arranged the pinky white, small chrysanthemums in the tin cross. When this was done, she took an empty jar from a neighbouring grave, brought water, and carefully, most scrupulously sponged the marble headstone and the coping-stone. It gave her sincere satisfaction to do this.

MABEL: (EMBRACING THE TOMBSTONE) (SOFTLY) She felt in immediate contact with the world of her mother.

NARRATOR: She took minute pains . . . For the life she followed here in the world was far less real than the world of death she inherited from her mother.

(MABEL GOES BACK TO BUSYING HERSELF AT THE GRAVE)

NARRATOR: (MOVES AWAY FROM THE GRAVE TO ANOTHER AREA OF THE STAGE THE DOCTOR'S HOUSE. FERGUSSON RUSHES OUT AND WALKS BRISKLY ACROSS THE STAGE, THEN AROUND TO A POSITION WHERE HE NOTICES MABEL KNEELING; THEN HE MOVES SLOWLY AS IF SPELL-BOUND.)

The doctor's house was just by the church. Fergusson, being a mere hired assistant, was slave to the countryside. As he hurried now to attend to the outpatients in the surgery, glancing across the graveyard with his quick eye, he saw the girl at her task at the grave. (MOVES CLOSER TO FERGUSSON)

FERGUSSON: She seemed so intent and remote.

NARRATOR: It was like looking into another world. Some mystical element was touched in him. He slowed down as he walked, watching her as if spell bound.
(LOOKING AT MABEL)

MABEL AND FERGUSSON: (LOOK AT EACH OTHER SLOWLY, THEN GLANCE AWAY SL. SUBCONSCIOUSLY)

NARRATOR: And each looked away again at once each feeling, in some way, found out by the other. He lifted his cap and passed on down the road. There remained distinct in his consciousness, like a vision
(STAYING CLOSE TO FERGUSSON)

FERGUSSON: (HE STOPS AFTER RUSHING OFF)
the memory of her face

NARRATOR: lifted from the tombstone in the churchyard, and looking at him with slow, large, portentous eyes.

FERGUSSON: It was portentous, her face. (AS IF MESMERIZED)

NARRATOR: It seemed to mesmerize him. There was a heavy power in her eyes which laid hold of his whole being.

FERGUSSON: (FEELING ENERGIZED) as if he had drunk some powerful drug. He had been feeling weak and done before.
(MOVING OFF TO WORK)

NARRATOR: Now the life came back into him, he felt delivered from his own fretted daily self.

The Love Unit was developed by:

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From a Workshop for Teachers

(This is the record of the seventh session of a workshop on voice conducted for teachers during the 1968 Summer Conference. A number of the workshops included demonstration classes with students who were also present at the conference. The session is on "The Body, Language and Style.")

Peter and the Wolf inspired the next two voice sessions. Although Prokofiev's recording was originally conceived to teach children the various instruments of the orchestra, the story is one that can be enjoyed on two levels: for children, it is a delightful story of adventure, suspense, and heroism; for adults, it is a satire on the politically strong vs. the impotent.

For the Seventh Session I worked with students exclusively, in order to share experiences in creating pantomime and sounds to convey certain effects. At the same time, I reminded them to keep aware of the rhythms that their bodies created and the tempo of those rhythms. If one drew the rhythms how would they look?

EMOTION	RHYTHM, TEMPO	SOUNDS
BOREDOM	(uneven pacing; slow, then fast, then stopping)	oh, tsst, hum
FEAR	(quick jittery movements; closed)	– eek, ahk, oooooh
PENSIVENESS	(slow continuous pacing movements)	um, um, um, hum
EXPECTANCY	(jerky nervous movements, stopping intermittently)	– eh? humhum, oh?
EXCITEMENT	(wide curvy movements)	-- oooeeeh, ooohooh, oohboyohboyoohboy
HEAVY WORK, RECURRING EFFORT EXPENDED	(side heavy, definite movements trailing off)	– uh, uh, uh
DESPAIR	(recurring soft slow movements)	– uuh, uuh, uuhuh, uuh

After demonstrating emotions, we discussed the translation of these rhythms and feelings into language. One example follows:

FEAR: I am trembling with fear now that the burglar has entered my room so I must lie quietly and pretend to sleep. Let me say my prayers.

Compared with:

What? Who's there? Door's open. A man! Oh, no! What's he doing NOW? Play possum . . . Lord, help me, pleeze!

Next, we listened to a sound story and its language equivalent. (On tape available from CRG.) We discussed the two versions. (See following.) Students were accurate in guessing what the sound story was about; they got up and moved freely to portions of it.

Finally we listened to Peter and the Wolf – Brandon De Wilde's narration, and a portion of Jimmy Smith's organ rendition of the Introduction and "Meal Time." Students volunteered to portray it through a narrator and pantomime for the teachers at the next session.

ADDITIONAL SUGGESTIONS:

Use the tape by having students listen to the work rhythms of Leadbelly and the Prison Camp Songs, as well as the rhythms of the Sorrow Songs, Chants, Field Hollers, Cries, and Children's Games. Suggest that one or two uninhibited students get up and move to each piece. WORK WITH EACH RHYTHM SEPARATELY. Other students can draw the rhythm.

Discuss the characteristics of the piece:

Tempo	fast or slow; flowing or halting
Span	short quick movements; wide slow movements
Beat	heavy accents or light; regular or irregular
Rate	constant; or progressively faster or slower
Tone	happy, plaintive; easy going, biting

Then insist that students write a sentence describing the feeling elicited from the piece in such a way that the style echoes the beat.

Examples:

1. "Pick A Bale of Cotton" A fast, regular rhythm which gets faster as the song proceeds; short quick movements which seem sung in a happy mood. Ask students how one actually picks cotton; or if they have never seen the activity, how they imagine it is done. Since bales are heavy and the work is not speedily done, what is the effect of a fast rhythm to describe a slow activity? (Let students suggest ways in which other subjects might be treated ironically, through the usage of sounds which do not echo the sense, a style which does not mimic the content; or by rendition which belies (or even belittles) the meaning of the piece. Play the medley by Voices, Inc., especially concentrate on "Pick a Bale of Cotton" for comparison.

2. "Take This Hammer" A slow regular rhythm which remains constant; wide regular beats with heavy accents. Compare this song with "Let Your Hammer Ring;" discuss the activity that each suggests. Attempt writing next, mimicking the style.

3. Next, turn to the actual words and examine for style and phraseology. (Appendix A) Discuss how songs might sound before playing them. Then have students justify answers by pointing to specific techniques on the printed page. Writing should follow.

4. Listen to sounds of the Sorrow Songs, etc. by Voices, Inc. More discussion of tone is appropriate here. What techniques contribute to a sense of plaintiveness, aggressiveness, or resentment, or bravado, or heartiness, for example?

The workshop was conducted by:

Carolyn Fitchett
Curriculum Resources Group of ISE

RECORDINGS USED WITH "THE BODY, LANGUAGE AND STYLE" AND RELATED UNITS

1. Take This Hammer. Leadbelly Verve FV59001
2. Negro Prison Camp Worksong Folkways Records FE4475
3. Roots An anthology of Negro Music in America. Voices, Inc. Columbia CL2393
4. Prokofiev: Peter and the Wolf. Narrated by Leonard Bernstein. Columbia MS6193
5. Peter and the Wolf. Jimmy Smith. Verve V6-8652
6. The Frontiers of Tomorrow Two Sermons by Billy Graham. World Records, Inc. W-3243 LP
7. Peter Marshall Speaks: Two Sermons. Caedmon TCR101
8. The Power of Positive Thinking. Norman Vincent Peale. "Expect the Best and Get It." RCA Victor LM-1794
9. Adam Clayton Powell
10. Help! The Beatles. Capitol MAS-2386
11. Baroque Beatles Book. Electra 306.
12. Expression. John Coltrane. Impulse A-9120
13. A Love Supreme. John Coltrane. Impulse A-77
14. Unit Structures. Cecil Taylor. Blue Note BST 84237; BLP 4237
15. Om. John Coltrane. Impulse A-9140
16. Sounds of Silence. Simon and Garfunkel. Col. CL-2469; CS-9269
17. Black Man in America. James Baldwin. Credo I. CMS 517
18. The Immortal Ma Rainey. Milestone. MLP 2001
19. Beyond the Blues. American Negro Poetry. Argo RG 338
20. A New Perspective. Donald Byrd Band and Voices. Blue Note ST 84124

From "Looney Graphs"

(This and the next selection are excerpts from among the 50 or so units -- the exact number depends upon your definition of a unit that comprise the freshmen mathematics program. There are more units than any one teacher can use. Different teachers use different selections.)

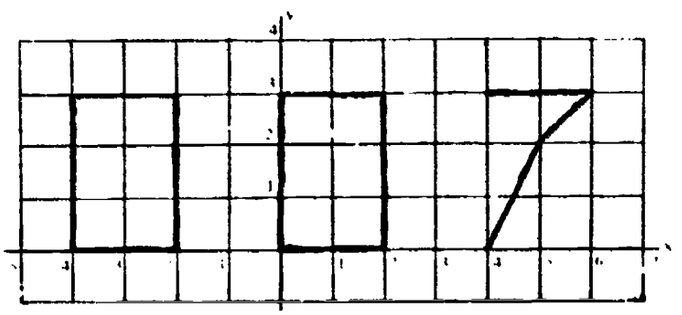
The teacher may wish to start by first passing out graph paper (½ inch squares). Then proceed as follows:

Give a set of ordered pairs that form some name or pattern. Consider:

1. (0,0)	5. (2,3)	9. (4,3)
2. (5,2)	6. (-2,3)	10. (0,3)
3. (-4,3)	7. (6,3)	11. (2,0)
4. (-2,0)	8. (4,0)	12. (-4,0)

A good hint: a real woman killer.

Also draw in lines as you go along as hints. We want student to get this reasonably soon.



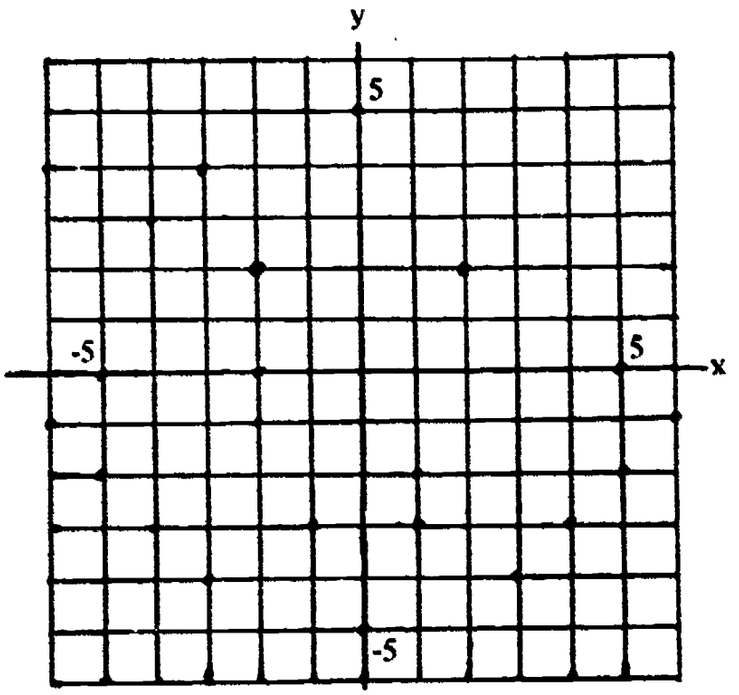
After students get this one, ask them to think of something that they could stump the class with. Students should be instructed to give hints and draw in certain lines to help and tease the rest of the class along. A student at Texas Southern came up with a good one: GTO. A G.T.O. is a very popular type of automobile.

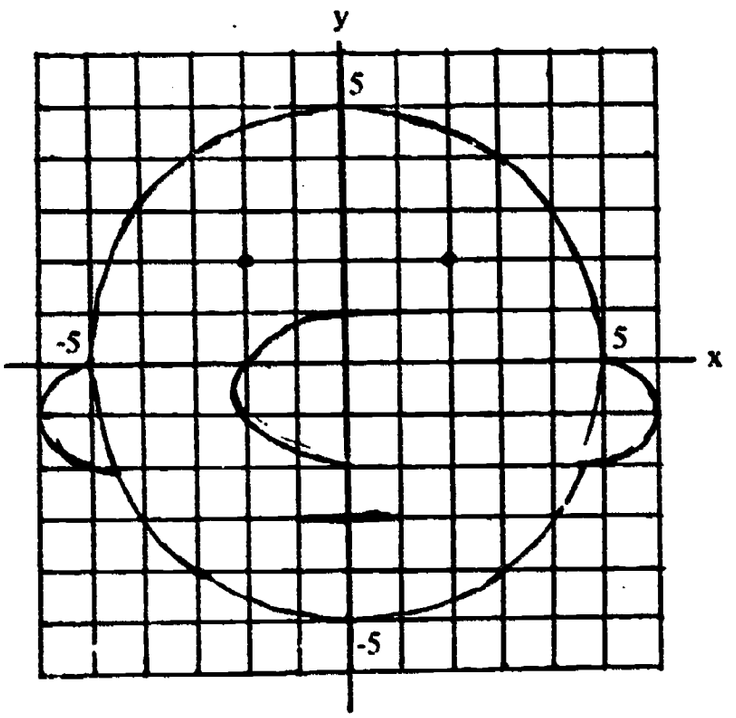
It would be instructive to spend the rest of the class period letting students make up puzzles like the one above. The students with the puzzles should give their clues on the board so that all can see.

At the end of the period students could be encouraged to think about puzzles of this sort to bring to class the next day. The next class period can be devoted to whatever graphs students have developed.

The "Charlie Brown" graph (see next page) is a harder one. The teacher may have to discuss terminology like $x^2=x \cdot x$ and $y^2=y \cdot y$.

Start the cartoon with the ordered pairs below it. When you have given several points (about 8), connect some points to give hints. It is unlikely that students will get this without the circle drawn in. After students have guessed themselves out, tell them that you will give one last clue. That is: $x^2+y^2=25$. If they can figure out how to graph this they will have the complete picture. You can get students started by asking what y could be if x were 3. Can x be 7? Can x be 6? What values can x have? You don't need to complicate matters by suggesting fractional values for x and y. It should not take long for students to see that the desired ordered pairs with integral coordinates are (3,4), (4,3), (5,0), (-3,-4), etc. This of course forms a circle with radius 5.





Points for Charlie Brown:

1. (2,2)	6. (-1,-3)	11. (-2,-1)
2. (-2,2)	7. (1,-2)	12. (5,-2)
3. (6,-1)	8. (1,1)	13. (-5,-2)
4. (-6,-1)	9. (0,1)	14. (0,-2)
5. (1,-3)	10. (-2,0)	

$x^2+y^2=25$

After students agree that the noble countenance belongs to "Charlie Brown," you could go on in the following way. (Most students know Charlie Brown from the Peanut cartoon series.)

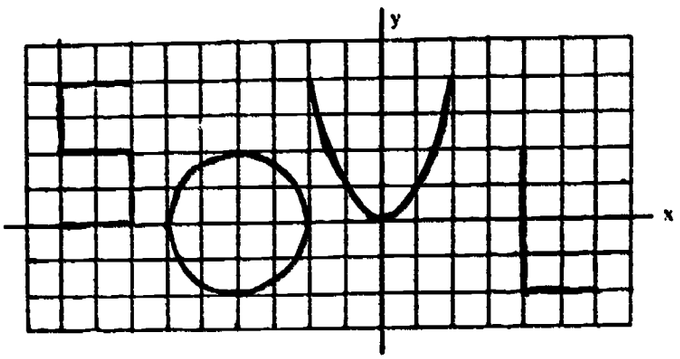
Give the following ordered pairs and equation clues:

1. (-9,0)	6. (-7,2)
2. (-7,0)	7. (4,0)
3. (-7,4)	8. (4,2)
4. (-9,2)	9. (6,-2)
5. (-9,4)	10. (4,-2)

Clues: $(x+4)^2+y^2=4$
$y=x^2$

The first clue is a circle with the center at (-4,0). Let students plot enough points and try to lead them to discover the displaced circle. The second clue is pretty easy. Have students substitute values for x until they see what the figure is (a parabola).

The whole figure turns out to be the word SOUL.



Next the teacher could draw the stick man (see next page) on the board. Ask students to decide which of the following equations are needed to form the stick man. The teacher might hint to students that three equations will be sufficient to construct the entire figure.

$y=\|x-5\|+5$	$y=\pm\sqrt{4-x^2}+9$
$x^2+y^2=4$	$y=\|-x\|$
$y=\|x+5\|$	$y=\|x\|+5$
$y=-\|x\|$	$(x-9)^2+y^2=4$
$y=\|x\|-5$	$(x-9)^2+(y-9)^2=4$
$x^2+(y-9)^2=4$	$x=\|y\|$

Students have plenty to choose from here. The teacher should encourage individual students to tell the three equations they think will draw the picture.

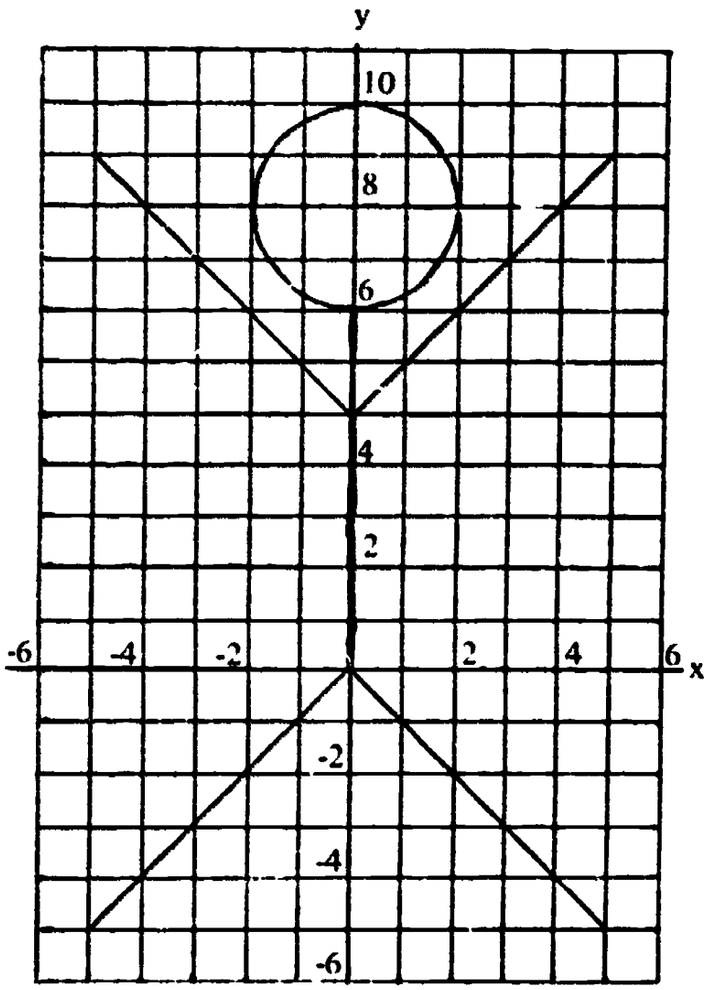
Each time a student suggests a set of three equations the teacher can have the class help that person get his three graphs drawn on the board. (Use the point plotting method.) Try to plan use of the board space so that each student's picture can remain on the board so that reference can be made to them later. (Graph boards are not necessary, a reasonably accurate drawing can be made using a yard stick.)

Sooner or later there should be enough data on the board to allow students to piece together the three forms they need to draw the stick man. The three desired equations are:

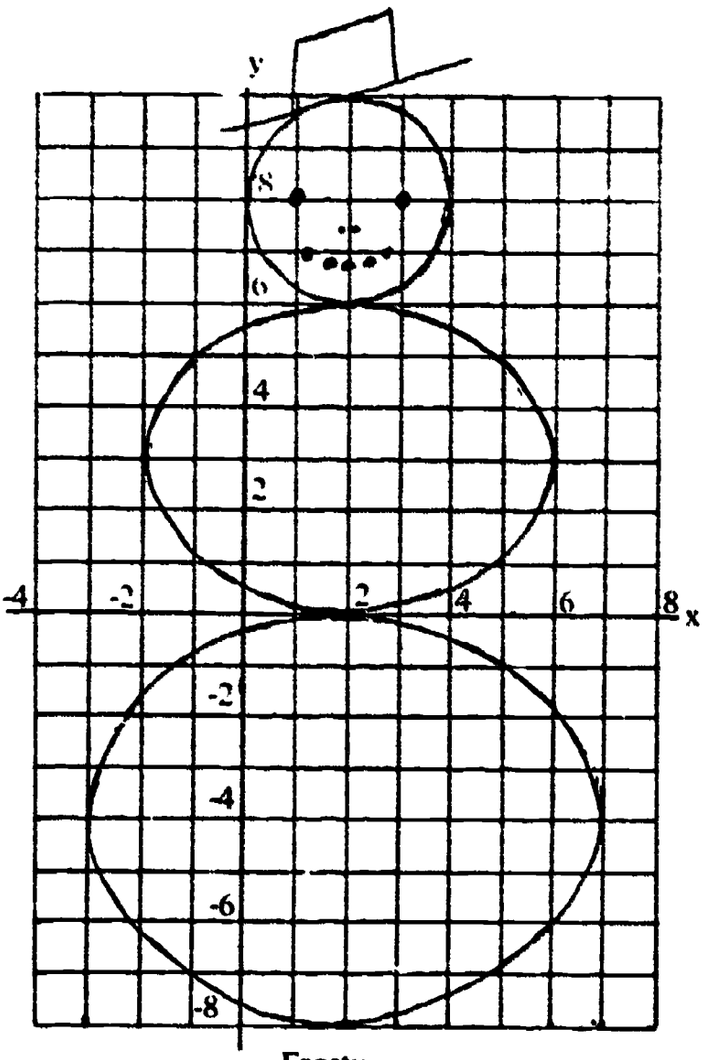
$$y = -|x|,\ y = |x| + 5,$$

and $x^2 + (y - 9)^2 = 4$ or $y = \pm\sqrt{4 - x^2} + 9$.

Next the teacher may want to give another matching game using new forms (ellipses). (Graph below.)



The Stick Man



Frosty

Pick out the right equations for "Frosty the Snow Man."

$$x^2 + (y - 8)^2 = 4$$

$$\frac{x^2}{16} + \frac{y^2}{9} = 1$$

$$\frac{(x - 2)^2}{4} + \frac{(y - 3)^2}{4} = 1$$

$$y = (x + 1)^2 - 2$$

$$\frac{(x + 2)^2}{9} + \frac{(y - 3)^2}{16} = 1$$

$$\frac{(x + 2)^2}{25} + \frac{(y - 5)^2}{16} = 1$$

$$\frac{(x - 2)^2}{25} + \frac{(y + 5)^2}{16} = 1$$

$$y = (x + 1)^2 - 2$$

The point to using "Frosty" is to show a method for moving ellipses around on the coordinate axes.

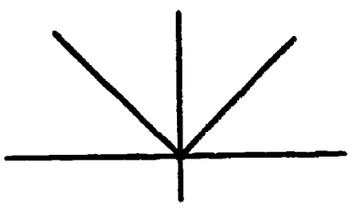
We must stress the importance of ample board space for this unit. When analyzing any one of these figures it is instructive to have graphs of all the students' choices on the board.

We are striving to develop student appreciation for forms and patterns given specific kinds of equations.

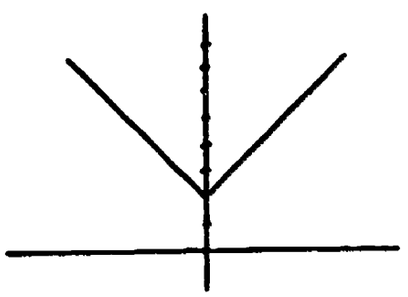
After working with "Frosty," the teacher may want to tie some of the ideas together. One way to accomplish this would be to suggest or write down equations and ask students to come to the board and make a quick sketch as suggested below.

Teacher writes: **Student sketches:**

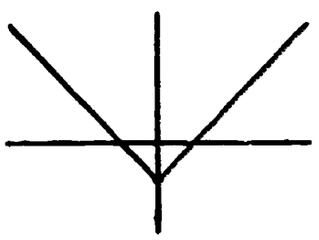
$y = |x|$



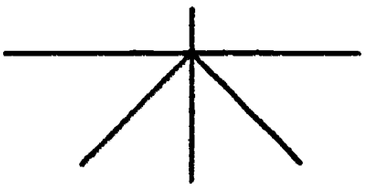
$y = |x| + 2$



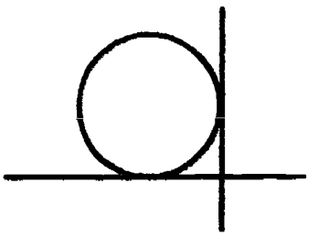
$y = |x| - 1$



$y = -|x|$



$$\frac{(x+2)^2}{4} + \frac{(y-3)^2}{9} = 1$$



Jack Alexander
Curriculum Resources Group of ISE
(Now at Education Development Center)

From "Switches and Batteries"

Materials: 50 batteries, 25 lamps and lamp holders, 200 feet of wire, 100 switches, tools.

At the beginning of a class pass out batteries, bulbs, and sockets, and some 5 or 6 inch pieces of bare wire but not any switches. If you wish, you can ask, "Can you light the bulb?" However, no one will be listening to you as they will all be trying to light their bulbs. The number of students who have difficulty lighting a bulb is often large. Some may even be afraid to pick up a battery, so be prepared for anything. At this time the need for a continuous electrical path, i.e., a "closed circuit," may come up in the discussion. If so, good; if not, it will come up later when switches are part of the circuit.

After a student has found how to light a bulb, pass out a switch and the makings of a battery holder. (A discussion on how to make a battery holder followed here.)

Before the students get involved in putting their switches in a circuit, you might ask if they have any ideas as to which is the "on" position and which is the "off." Many instinctively know that


is "on"

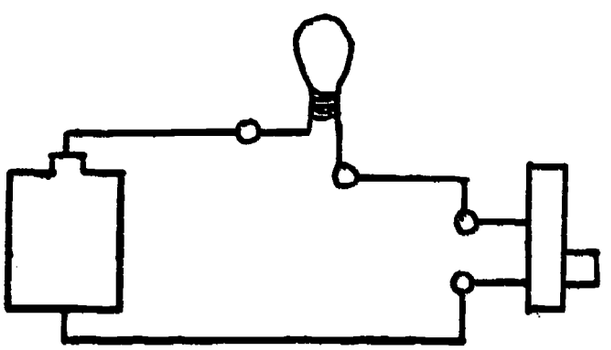
and


is "off."

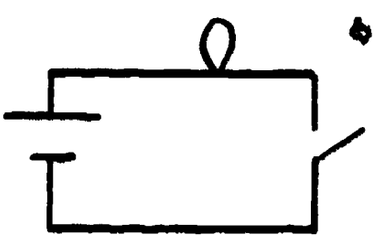
However, most students tend to make statements in terms of right or left or some other irrelevant parameter. Few will look carefully at the switches, see how contacts are made, and give a clear description of the switch operation. A few students should be encouraged to take a switch apart, using pliers, so that everyone can see how it works.

When students hook their switch up with a battery and bulb, two circuits come up with about equal probability.

Circuit I

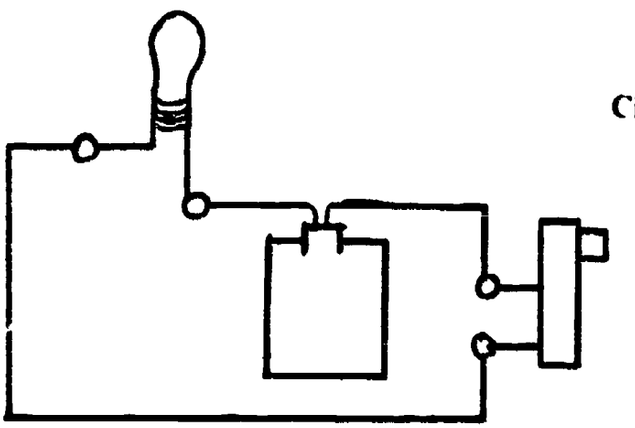


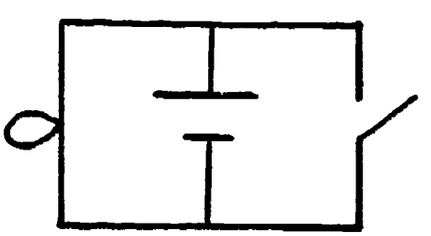
Pictorial Diagram



Equivalent Schematic Diagram

Circuit II





In Circuit I the bulb lights when the switch is,

i.e. "on."

In Circuit II the bulb lights when the switch is

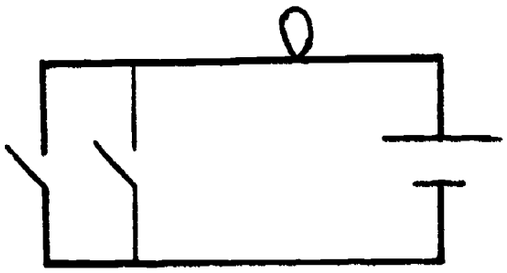
i.e. "off."

A good argument should now ensue as to which is really the "on" position. While the argument proceeds, everyone should keep the switches in the position that lights the bulb. Otherwise, there will be a number of dead batteries.

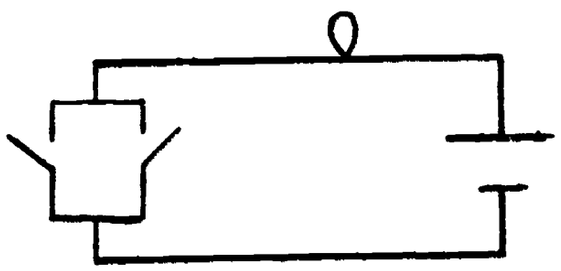
The problem of why the bulb lights in both these circuits implies the question, "Why does the electricity flow in the wire rather than through the bulb?" At this point, if the class is interested, it can pursue a study of electricity, using the ideas in the Elementary Science Study unit, Batteries and Bulbs, as a basis.

Going on to the Boolean Algebra aspect of this unit, a second switch can be passed out once the students agree that Circuit I represents all valid switching circuits composed of a single switch, battery and bulb. With the second switch, the question is again to look for various types of switching circuits.

When several circuits are drawn on the blackboard, discuss which are really the same (with respect to the flow of electricity) and which are really different. For example:

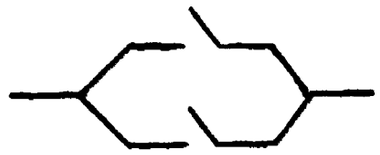


and

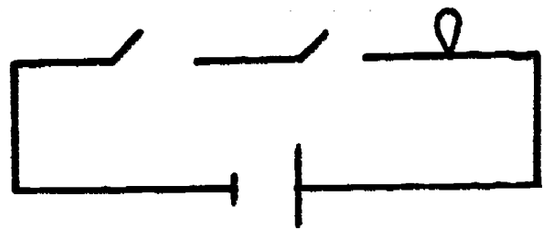


are really the same electrically but slightly different physically. There are only two possible circuits with two switches that are electrically different:

and



These switching diagrams are simplifications of diagrams of the whole circuits,



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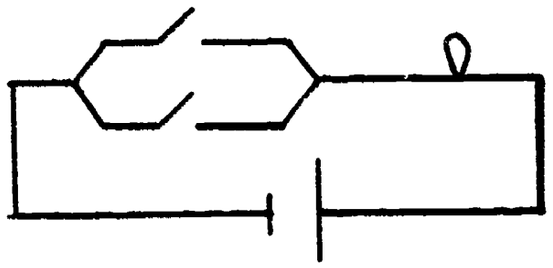
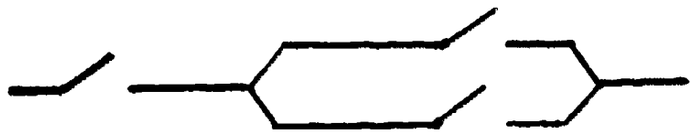


but the single bulb and battery remain constant throughout, thus making the switching arrangement the only varying component to diagram.

Also consider what circuits can be made with three switches that light the bulb. Diagrams and discussion. (There are three possible circuits.)

all on

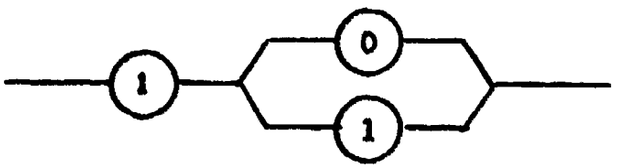


2 or 3 on

1, 2 or 3 on

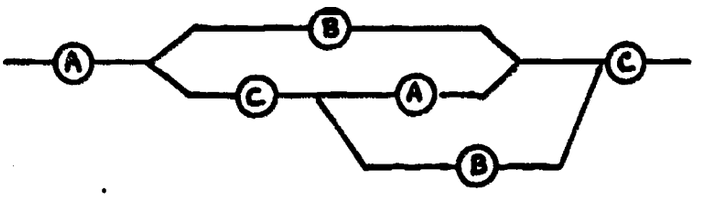
Encourage students to try for simple representations, even to a representation that does not involve drawing a switch as above.

After maybe one more switch question (light the bulb with four switches), ask "Since this is a class in mathematics, can you represent the state of a switch (i.e., "on" or "off") with a number?" I think this question is crucial to get to a "0" and "1" representation. "0" and "1" are the two "simplest" numbers to use. "0" is a logical choice for "off" as nothing happens when the switch is off. It is really arbitrary whether off is "0" or "1," but it is much more convenient to use "0" when we go to the algebra. By this time a circuit might be represented as:



From now on most of the discussion can be abstract; however, the switches are always available for the doubters. At any point in what follows there is a direct correspondence between an abstraction and the switches. This is a particular beauty of two-valued Boolean Algebra.

(The remainder of the unit, 7 pages, discussed one possible approach to developing Boolean Algebra further, eventually discovering how Boolean Algebra helps to simplify such complicated circuits as



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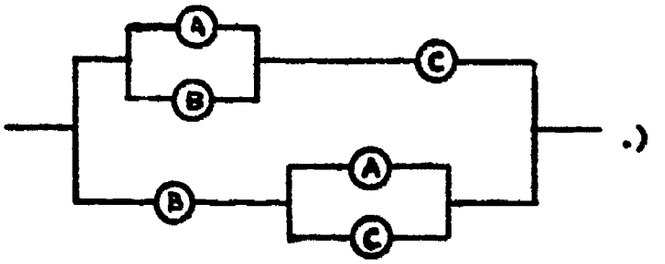

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William Nicholson
IBM Watson Laboratory
New York City

III. A STATEMENT OF HOPES AND ACHIEVEMENTS

The Components

From the work done so far, what are the goals and methods of the Thirteen College Project? What do we think is worth teaching and how are we trying to teach it? These questions do not admit simple answers. The way to reply is rather with some list of leading ideas, a list which is itself still open. This section attempts the beginning of such a list. And in this effort, it is perhaps permissible to skip about indiscriminately, from goal to method, from one field to another. The list begins with some leading ideas about the design of the project itself.

A Consortium

In this effort, the establishment of a consortium, involving a number of colleges, and the continuation of the project over a number of years, play key roles. The present system of instruction, of lecture and demonstration, is reinforced at every point on the campus – in the textbooks used by teachers, in the college bookstore, in the kind of laboratory equipment employed, in the use of national standardized tests, in the certification of professors, in the accreditation of the colleges, in the school architecture, in the line items in the budget, and in the departmentalization of the faculty. To introduce something new and different in this environment is very difficult. The purpose of the consortium is to help create a new environment supportive of the new effort. It includes independent resources and a colleagueship with like-minded faculty on your own campus and in other institutions.

Invention, Feedback, and Dissemination

But in seeking to develop new goals for education and new ways to achieve these goals, we do not know all the answers. We do know some things to try, however, and this is the reason for seeking to keep the project running for a number of years. We want to try out ideas, see what happens, get feedback, and try again. The work with the second generation of freshmen should benefit from the work with the first generation. The second summer workshop should benefit from the experience of the first summer workshop. New things should be possible with the students turned now sophomores, because we can build on their unique experiences the first year. We are still in the invention and feedback stage. Eventually we hope to produce books, diaries, units, films, tapes (all usable by other teachers); to turn out alumni of the program who will influence other teachers and colleges; and to see institutes and graduate programs established in which these materials will be used and the faculty alumni serve as teachers of teachers.

Why the Emphasis on Predominantly Negro Colleges?

The program also starts from the hard and fast fact that segregation is both the cause and result of the poor position of blacks, relative to whites. The Civil Rights Movement, the opinion and policy-making agencies in society, the various legislative programs all contribute to overcoming separation. But other approaches are also necessary, not the least of which is education itself, whether integrated or not. The predominantly Negro institutions already exist, enrolling over half the Negro students in the country. They are not going to disappear over-night, anymore than race prejudice is going to disappear over-night. Improvement of these institutions will help overcome segregation in society generally, including, ultimately, segregation in higher education. The curriculum reform movement began with work in science and mathematics for middle class white students. It is now extending to work in all fields and to students from backgrounds of poverty and discrimination.

Natural Solutions

The consortium and the system of invention and feedback and our hopes for dissemination are not empty mechanisms. The project has an educational philosophy. We are seeking what might be called natural solutions to educational tasks. The way to learn to write is to have something you want to say, the way to learn to read is to have something you want to find out about. This approach holds both for learning the mechanics, the skills, of these pursuits and for developing taste and judgment in literature. Skills are important, but the idea is not just to learn them as preliminary exercises before getting to the real purposes for which language exists. And if students are to develop taste, they must start exercising the appropriate faculties from the beginning, deciding in the context of their own experience whether a given book deceives or tells the truth. The notion of natural solutions to educational tasks applies equally to the other subjects in the program, to mathematics, to natural science, and tc social science.

Paperbacks

Remarks about what to teach and how to teach it cannot be all generalities. We do have to start offering some specifics. The use in the program of paperbacks in English and in social science, and also in mathematics and natural science, constitutes an application of the principle of natural solutions. The theory is that the way students read and learn in the classroom should approximate the way real people read and learn – and the experience the first year bears the theory out. Students like the books, read them, and lend them to their friends. The theory, now supported by experience, is to work from real books, not from textbooks and official anthologies, which weigh too much to carry around and in which everything is codified, set in order and prejudged by someone else. The use of a library of paperbacks suggests that you can drop some works from the library, add others to it, and this holds whether you are a teacher or a student. Further, for students coming from homes without books and going to college without an intellectual tradition, giving a student the beginning of his own library is essential.

Initiative and Inquiry

Ordinarily in science instruction for freshmen, the purpose of the physics or biology or chemistry laboratory, if there is a laboratory at all, is to demonstrate to students scientific truths already arrived at. One purpose of the laboratory in the Thirteen Colleges Curriculum Program is to enable students to initiate and pursue inquiries in which the answers are not given. And one anticipated result is that such students, when confronted with novel situations, will do better than traditionally educated students in applying what they know. These notions apply to all fields studied. In English it means emphasis on creative writing (not just for "talented" students), open discussion, and classroom dramatics; in mathematics it means the emphasis on arousing curiosity and problem-solving, not applying memorized rules in set situations; in social science it means "street corner research," field trips, and fresh examination of familiar data.

Black-Related Studies

The use of books in English and social science by black writers describing their own experiences (Ralph Ellison, Claude Brown, Malcolm X) or by white writers describing the causes and consequences of racial intolerance (Charles Silberman) gives new meaning to the much abused educational ideal of relevance. This is one important component of the program, but not the only one. The purpose is not to replace white jingoism with black jingoism. This does not mean that other contemporary topics do not also belong in the curriculum – war and the Bomb, the population explosion, the decline of the "inner" cities, and so on. This means only that black history and the new black assertiveness is something worth studying, understanding, and exploiting. The implication is also that white institutions might also do well to introduce black-related studies into the curriculum.

Closer Relationship Between Students and Faculty

Another fundamental notion in the program is that the teachers and the textbooks do not have all the answers. The fact is they do not even ask all the questions. Students are encouraged to ask questions and to start lines of inquiry in their classes. Now, of course, this approach also has its pitfalls. When students learn that teachers like lively classes, they will try to supply them for non-educational ends. They learn to, what they call, "fillibuster" – talk off the top of their

heads and so postpone hard work and forward progress of the class. But the program is designed to allow teachers to learn also; to learn how to draw out the great and true benefits of such instruction. Student participation in the classroom has more general implications. It is no secret that in these colleges the relationship between faculty and students, for the most part, is distant and formal. More dialogue in the classroom means more dialogue outside the classroom.

Ideas and Their Expression (English)

In examining the program, it is necessary to consider the goals and activities of the project as a whole, but it is also necessary to consider the goals and activities of the work in particular subject areas. The Course on Ideas and Their Expression treats together (itself an innovation) both the study of writing (or "composition") and the study of the humanities, literature for the most part. Writing as usually taught has some such objective, as learning to write clear expository prose. The Thirteen-College Curriculum Program views the teaching of writing in a larger context. What the student says and how he says it is viewed as part of his own search for identity and competence. He writes what he is and becomes what he writes. And literature as usually taught is the coverage of a standard list of great books, the books for which all the "ponies" and "trots" are written (these works you now find in the college bookstores). The student is supposed to analyze the form, consider the place in the history of literature, and so on, for such works. The Thirteen-College Curriculum Program views the study of literature also in a larger context. We emphasize that the fundamental purpose of literature is to connect to life, to inform life. You judge literature against the experience of your own life, but you also, through literature and other forms of art, come to enlarge that experience, and hence your own life.

Quantitative and Analytical Thinking (Mathematics)

Instruction in mathematics faces the tough task of working with several audiences at the same time. These include the student planning a career as a mathematician; the student who needs mathematics for other professions, such as science, engineering, teaching, medicine, business; and the student who needs enough math to meet the demand of ordinary daily affairs. In actual practice, both by mathematicians and by users of mathematics in other professions, the subject involves creative thinking, analysis, and intuition to a much greater extent than that generally appreciated. This aspect of mathematics is generally neglected in the schools and in the early years of college instruction. Through the selection of topics and approaches, it is this aspect of mathematics that the Thirteen-College Curriculum Program has chosen to emphasize. Such instruction in the freshman year gives both the prospective mathematician and the prospective user of mathematics a better sense of, and better preparation for, more mature work in mathematics. Also, such instruction is valuable for the general student, since for the first time he will gain some idea of what mathematics is really like. Finally, the emphasis on imagination and thinking in mathematics will have transfer value for imagination and thinking in other fields.

Social Institutions: Their Nature and Change (Social Science)

It is in this field, above all in the schools and colleges (but especially in the schools, and the freshmen, of course, have just emerged from the schools) that phoniness in education is rampant. It starts with the very economics of the publication of textbooks. Seeking widespread adoption of their wares, the publishing houses muffle, when they do not altogether overlook, controversial issues. Effective and authentic instruction in the social sciences is further handicapped by the compartmentalization of knowledge in the academic establishment. You do not have the study of man; you have economics, sociology, history, geography, anthropology, political science, and psychology. The Thirteen-College Curriculum Program, through the selection of topics, books, approaches, and films, attempts to deal with the great problems of today and set them in the perspective of history and the other disciplines of the social sciences.

Natural Science (Physical and Biological Sciences)

The course in the natural sciences (especially physics), like mathematics, has the problem of addressing simultaneously several audiences. The course must prepare students who plan to major in science for the next course in the catalogue.

At the same time it serves as a terminal course in science for the non-scientist. And the hope is also to interest students in science or science-related careers, students who previously had not considered majoring in this area. In offering a course in science for the non-scientist or in trying to interest novices in science, the first task is to reduce repugnance for science, fear of science, and to generate an appreciation for science. Part of the difficulty is that science (especially physics) constitutes a huge and foreign domain to which there is no approach, something like the way the Library of Congress must look to a person who can't read. The idea is that you don't attack the Library of Congress whole: you learn to read and enjoy a few books. Similarly in science, you don't have to cover everything but you can get to work studying specific sets of phenomena. The hope in making science a requirement in the program, even for non-scientists, is to break the cycle by which repugnance for science is communicated from generation to generation. Many of the students in the program will become teachers and more, of course, will become parents. The hope is that they will gain new attitudes toward science and that these new attitudes will be instilled in their students and their children.

Role of ISE

The Negro colleges have to be cautious about third parties with plans for their "development." Too often such plans have represented a vision of the schools based on myth and missionary zeal, hardly a good foundation for building a sound program. The relationship between ISE and the colleges is characterized by a candid analysis of problems and a high degree of trust and cooperation. The people at ISE work with the participating colleges in the following ways: They organize and run the summer conferences; assist in the development of new materials and teaching practices; visit the campuses during the academic year; bring teachers together during the year in small groups to work out problems arising with new materials and practices; and evaluate various aspects of the project. Ultimately, ISE hopes to bring the results of the project before a wider audience – teachers at other colleges, educational authorities, and the general intellectual community. Publication on a non-profit basis is planned for a new literature about education, including both curriculum units and accounts by teachers of what is happening in classrooms.

Student Goals

The purpose of the program is to graduate students who will be able to cope with the world on their own terms and to work to change it for the better. This means that students must know specific things about specific subjects although different students can know different things, and the subject need not be defined in traditional terms. This also means that students must know how to find their way around the intellectual, moral, and aesthetic worlds, which ultimately should be one world. Intellectuality is a virtue; possession of a usable fund of knowledge is a virtue; courage, sensitivity, initiative, responsibility, and independence are also virtues. (You will find all these goals enumerated in the college bulletins, but this does not mean the attempt to achieve these goals in practice is not new.)

Teacher Goals

The program not only focuses on the materials and the content of the courses, but it also focuses on the teachers of the courses. The traditional role of the teacher in many colleges, and especially in the predominantly Negro colleges, is to be the authority. The teacher tells things to the student; he (or she) tests the student, he paces the student. Placed in this role, the teacher cannot admit his ignorance when he doesn't know the answers. He tries to avoid questions from students and tries especially to avoid straying from his own field of specialization. The Thirteen-College Curriculum Program views the teacher differently. It views him as also a learner and provides him with the time and resources to be so. As a learner he is supposed to know something, but not everything, and he is supposed to know how to find things out. He is a scholar in the usual sense of keeping abreast with developments in his field and in pursuing subjects of special interest to him. And through participating in curriculum development and other forms of educational innovation, he is also a learner in the new sense of learning how to teach more effectively, investigating what is worth teaching and how to teach it. We hope that the teacher will play still another role. He will work to persuade the other teachers and the administrators in the institution where he is employed of the merits of this new approach to education and perhaps initiate some curriculum development projects on his own.

Institutional Goals

A long range purpose of the project is to bring about changes in the regular college curriculum through the example of the success of the project. This would take the form of the adoption in other courses and levels of some of the project's instructional materials and methods. It would also take the form of changes in institutional structure to permit students and teachers to originate and carry forward experimental educational programs as part of the regular business of the college. Such changes would include free time and special facilities for teachers to develop and try out new materials, and permission to students to take the new courses without loss of credit. The project also hopes to demonstrate the possibilities of a reduction in attrition rate, particularly in the first two years of college; and to have a group of students enter their junior year with a level of academic preparation and positive attitudes toward learning that will improve the quality of work they do in their academic majors.

Evaluation

The project is engaged in two kinds of evaluation, evaluation of procedures and evaluation of outcomes. The first kind of evaluation seeks to determine whether we are actually achieving in the day to day operations the kind of classroom we are trying to achieve. It includes a clinical look at instructional practices and student activities. The second kind of evaluation is the more familiar comparative study of what is happening to students in terms of their performance on standardized tests. It includes measurement of gains in academic achievement and changes in attitude toward self and learning. The two kinds of evaluation are geared to the goals of the project – student, teacher, and institutional goals. Together they seek to determine what is happening and why.

A Need for Experiment

Not Just Students, Not Just Black

Over the past few years the predominantly Negro college has developed an acute awareness of and responsiveness to problems in higher education in America. A few years ago there was a tendency to act as if (whether it was explicitly stated or not) the problems of the black institution differed in kind from those of major white institutions. Now we are learning that the problems are only different in degree. In the past we spoke of students "woefully and inadequately prepared to undertake vigorous college work." This is still true, and no doubt truer of schools with predominantly Negro populations than of some other more exclusive types of major American institutions. But equally true of all but a very few American institutions of higher learning is the fact they are themselves woefully and inadequately prepared to undertake vigorous college work with their student populations. And the phrase "vigorous college work" denotes more than just hard, tedious, rigorous work. It means, in the minds of both students and some faculty, work that is relevant, complete, and satisfying (emotionally or otherwise).

Search for Relevance

Many colleges, for their survival and health, are beginning to seek or provide money for curriculum development. Course descriptions in college catalogues are being re-examined toward the end not only of proposing new course offerings for contemporary relevance (a question of content) but also of finding ways (primarily pedagogical) to re-emphasize intellectual relevance (a matter of approach). Contemporaneity of content is by no means a guarantee of intellectual relevance. Indeed, by stressing "content" above all else, some current programs not only fail to satisfy legitimate student demands but seem actually to be compounding the causes of student dissatisfaction. Almost any "content" can be intellectually relevant, provided that it be explored in some depth and approached with a sense that many angles of vision not only may be, but must be, employed.

And for Honesty

The criterion of intellectual relevance demands, above all else, a respect on the part of educators for the intellectual integrity and independence of the student, not by pandering to the ignorance and narrowness of youth but by demanding of the young the most serious thought of which they are capable, and then by taking that thought seriously – not as sacred truth, but as honest intellectual work. The youth of this generation, far from being amoral, are struggling to develop for themselves and future generations a more honest framework of values from which to operate. And they are forcing our academic institutions to make their actions, their practices, more consistent with their expressed values. In many cases, these expressed values are themselves under attack. The traditionally accepted shibboleths of the "well-rounded person," the "cultured gentleman or lady," no longer have operational meaning. The challenge to modern institutions is to educate without at the same time producing a class differential rooted in the snobbery of false values, thereby producing hypocrites.

This problem is made even more acute by the fact that colleges are now receiving from the high schools a larger number of socially responsive and academically keen students. The effect of special secondary school programs is beginning to be felt even in predominantly Negro colleges. There is a desire among these students to be given the sense in some way or another of being responsible for their own education, especially as they see the intellectual, and even the moral, values implicit (or explicit) in academic work blatantly missing from the lives of so many of their elders. Their longing to organize their education into forms that will ensure its integrity must be translated into principles and practices of classroom pedagogy.

Younger Faculty Discontented

This desire – this need – has spread even to members of faculties, especially the young faculty members, who are themselves questioning traditional practices. Traditionally, the newer and younger instructors are assigned the remedial, or the large routine survey, or the skill-development courses. Such teaching assignments are seen, at best, as necessary chores which cut into a teacher's intellectual vitality. Faculty members, who might otherwise bring new energies and directions to their colleges, are caught in a remedial function of drilling previously missed skills in reading, writing, and arithmetic. They, along with their students, soon lose interest in such work. The results are that either (a) the teachers lose the intellectual verve which is the life of the academic community. Unable to correlate their classroom work with their conception of the intellectual climate of the college, they eventually abandon their roles as contributors to that climate. Or (b) they join the students in giving voice to their dissatisfaction with the climate of the college. It used to be that poorly prepared students and uninspired teachers led to lethargy. But today, in the wake of new social consciousness, this condition is just as likely to lead to a form of action that, even more quickly and severely than lethargy, can limit a college's ability to function.

New Beginnings

The solution to these problems is a fresh look at education, one that sees it as a dynamic process, rather than as a static compendium. Unless new approaches and new materials are continually being tried and refined, colleges – like any other institution – stagnate, and fail the hopes of the young. Institutions must begin and are beginning, to feel that it is as legitimate for them to experiment and investigate in the broadest ways as it is for any scientist to do so in his own speciality. An experimental program of curriculum development housed within the colleges, and yet given leave to act independently within the parameters of good judgement, can provide just the incentives and leadership that are necessary.

Advantages and Disadvantages in Negro Colleges

This process of experimentation is just beginning. Such experimentation is costly, both in dollars and in manpower, imposing a strain that predominantly Negro colleges, because of the economic status of their population cannot tolerate without assistance. They are further handicapped because of the relative paucity of bright and vigorous instructors who can be welded into the kind of team necessary for success. The years of economic deprivation as well as the stigma associated with poverty have served to develop a more hardened pattern of traditionalism than prevails in some of our other major institutions. Predominantly Negro institutions have for too long had to "make do" and to try, inadequately, simply to imitate white major institutions. But despite the presence at predominantly Negro colleges of an "old guard" at least as conservative as any academic "old guard" anywhere, and despite the imitative quality of the programs at such colleges, it turns out – paradoxically enough – that these colleges are at the forefront of experimental educational activity. (This is so mainly because of the sense of urgency that social conditions have brought to these colleges, a sense heightened by the need for colleges to perform a first-rate intellectual job to meet the demands of today's "New Blacks" for such a performance.

The insufficiencies of any college show themselves most clearly when special demands are made upon it. The administration of Negro colleges have been quicker to acknowledge publically the problems besetting their institutions than have their white counterparts, for reasons that need not be recapitulated here. The point is that Negro colleges, being relatively uncommitted to presenting and preserving an image of near perfection, are presently capable of incorporating massive change into their structures and methods of operation, and can thus serve as a testing-ground for ideas of development and innovation that, in the future, may prove useful, even essential, to undergraduate education throughout the country. The very exigencies of the time place them potentially in a position of leadership, if they can attract financial assistance.

Origins and Accomplishments

How It Started

The story began in 1963 when the Panel of Educational Research and Development, established by President John F. Kennedy's Science Advisory Committee, became concerned about what could be done to improve Negro colleges. The major efforts in curriculum reform, such as high school physics, biology, and chemistry courses, were directed mainly to white, middle-class students. The Panel on Education Research and Development under the chairmanship of Jerrold Zacharias, was concerned about segments of the educational enterprise as yet untouched by curriculum reform.

Samuel Nabrit, the President of Texas Southern and a member of the Panel, and Herman Branson, then Chairman of the Physics Department at Howard and a participant in several seminars run by the Panel, were deeply involved in those discussions and all subsequent ones along with Negro and white college presidents and officers of major foundations such as Carnegie, Ford, and Rockefeller. In this group and the ones that followed were such men as Jerome Weisner, who was at the time President Kennedy's science adviser; John Gardner, then President of the Carnegie Corporation, and Presidents: Stephen Wright of Fisk, Kingman Brewster of Yale, Logan Wilson of the American Council on Education, Luther Foster of Tuskegee, J. C. Warner of Carnegie Institute of Technology, Martin Jenkins of Morgan State, and Samuel Proctor then of North Carolina A & T College. The driving force in that period was Jerrold Zacharias of the Panel and a member of the President's Science Advisory Committee. Joseph Turner, now with ISE, was the executive assistant for the Panel.

In the summer of 1963, a report entitled "Program for Negro Colleges" was written by Samuel Nabrit and Stephen White. This was widely circulated and was followed in the fall by a conference convened by the American Council on Education, out of which was formed an Ad Hoc Committee on the Negro colleges, under the chairmanship of Mina Rees, Dean of The Graduate School, City College of New York. This group planned several concrete programs and approached funding sources with them. Thus, in the summer of 1964, 237 teachers from Negro colleges were enrolled in five, eight-week institutes at the University of North Carolina in biology, in English at the University of Indiana, in history at Carnegie Tech., in mathematics at the University of Wisconsin, and in physics at Princeton. This was supported by the Carnegie and Rockefeller Foundations. The goal was to give teachers the opportunity to do advanced work in their fields and to gain familiarity with the new movements in curriculum reform, in the hope of producing ferment on the campuses.

Also in the summer of 1964, the first summer curriculum writing conference met at Pine Manor Junior College to design an innovative pre-college curriculum in English and mathematics for six centers at Fisk, Howard, and Texas Southern Universities and Dillard, Morehouse, and Webster Colleges. The centers started in March of 1965. Both the curriculum conference and the start of the centers were supported by the Carnegie Foundation. These programs were administered by Educational Services, Inc., with the Curriculum Resources Group having primary executive responsibilities. The idea, however, was to form a separate non-profit corporation which would devote its full-time efforts to programs for Negro colleges with their full involvement.

In April of 1965, this new corporation was formed and called the Institute for Services to Education. The programs in progress shifted to its control. There were the six pre-college centers which in the summer of 1965 enrolled the same 900 high school seniors who had entered there the previous March in an intensive eight-week pre-college experience, using the curriculum materials created at Pine Manor.

These centers were supported that summer by the Office of Economic Opportunity and became the most influential model in the design of the Upward Bound Program.

The ESSO Foundation, in the same period, created ESSO Faculty Fellowships for work on the doctorate for Negro college faculty. In the summer of 1965, the teacher institutes increased from five to nine to include the fields of economics, psychology, business administration, and chemistry. Summer curriculum writing institutes were held in the summers of 1965 and 1966 to improve and expand the pre-college materials started in 1964.

In October of 1965, ISE agreed to perform educational planning, support, and consultation services in the initial expansion of the Upward Bound Program from eighteen pilot programs to 215 programs in the summer of 1966. The year of involvement as consultant to a large national program proved to be diversionary in terms of ISE's primary mission. Thus, in the summer of 1966, ISE decided not to continue with Upward Bound and to turn ISE's efforts back to being a catalyst to programs for Negro colleges.

With a grant from the Carnegie Corporation, an ISE Washington office was set up in June 1966 with Samuel Proctor as President and the Curriculum Resources Group was continued as a part of ISE in Newton. Plans were immediately started for a cooperative effort in curriculum innovation at the college level based on the prior experience of ISE and the expressed need of the colleges.

The basic idea was to form a consortium of colleges interested in an experimental freshman year and to submit an application to the Developing Colleges Program of the Office of Education for the colleges. ISE sought and secured funds elsewhere, from the Office of Education and the National Science Foundation, for an expanded Curriculum Resources Group. Parenthetically, the idea embodied in the developing colleges legislation was developed by President Lyndon B. Johnson's Education Task Force chaired by John Gardner. It was subsequently developed into a legislative proposal and became Title III of the Higher Education Act of 1965, from which each college received its grant for this program.

The plans of the 1966-67 year led to the 1967 Summer Conference at Pine Manor and the 1967-68 experimental freshman year with thirteen institutions, the colleges having determined this was the kind of program in which they wanted to involve their resources and staffs.

Leading Ideas

To sum up this historical abstract, there are four ideas which run through these developments.

First: This effort dates from the national concern in the society for reform in education which began in the early 1950's and was accelerated by sputnik and accelerated in still a different direction by Watts and it's successors.

Second: There was an awareness that the major reforms of the new physics and biology, for example, had not addressed themselves to large segments of the population called variously, deprived, disadvantaged, and depressed. The post-Watts era accelerated the awareness of this problem. The sputnik era had a foreign policy theme, America versus the Russians, whereas the Watts era has a domestic theme, America against herself.

Third: The concern for improvements in education should be coupled with clear imperatives to seek new educational directions. As we have seen in the first year's experience, the fruits of some of the past efforts at reform need special adaptations when used in this new population. Conventional ideas, such as an increase in doctorates on a faculty, are only partial answers, since an increase in the number of Ph.D.'s has not been noted, in and of itself, to improve the quality of undergraduate instruction. Thus, in the current efforts, as in the teacher institutes and in the pre-college program, mechanisms for the stimulus of the new educational thinking is a must.

Fourth: These institutions must, with help, furnish a large part of the creative energy; or the issue of their viability would forever remain in doubt. Educational pioneering is not the exclusive prerogative of the prestigious and rich institutions, nor does the direction of change need always flow from the prestigious to the less prestigious. Since it is their destiny in the balance, these institutions must marshal internal strength equal to the challenge. Under proper conditions, answers are more likely to be forthcoming out of their experience being built into theory rather than someone else's theories being applied where they do not fit.

Review of the First Year: 1967-1968

In the first weeks of the 1967 Summer Conference there was an uneasiness bred by disparate institutional and human personalities, all in an unfamiliar environment and not quite knowing what to expect of each other or of ISE. As it became clearer that ISE could not be expected to furnish pat answers but only to stimulate questions and a collective quest for answers, the group coalesced into a working force with high esprit de corps which did produce the basics of a freshman curriculum by the end of the summer.

The problems of working out complex agreements which allowed thirteen independent institutions to move forward from a collective fourteenth college at Pine Manor into thirteen versions of the original were solved. They have held through 24 months of buffeting by unexpected events and the pressures of reapplying for funding in November 1967 before the program was settled well on each campus.

The instructional program has also held its essential qualities through a much larger number of institutional and individual teacher variations than anyone had imagined. It is clear to any reasonably perceptive observer that these young people were changed to more alert, more questioning, and less passive participants in their education, in some instances even to the point of a kind of cockiness and bravado.

As in the case of a young student who, after he had answered a number of questions from a visitor from ISE, turned the tables and said, "May I ask you a question, Mr. . . . uh . . . what did you say your name was? What do you do that requires you to ask me all these questions? Are you the ISE-FBI or something?"

It is clear that before this program runs its course it will be asked about the disproportionate numbers of students who ask themselves and their teachers hard questions and will not accept simple answers.

The holding power of the program was impressive. At the end of the year dropouts ranged from 5 percent to 12 percent; and even with summer casualties, a minimum of 80 percent was expected that fall. From current estimates 65 to 70 percent will enter their junior year in September of 1969 against previous figures of 50 percent of less.

Now, of course, during the year the obvious things, such as reduced class size, smaller total student load, the number of preparations and preparation time, the summer planning, and the reduced teaching load have been called to our attention many times as the main source of any seeming results.

The testimonials of the students indicate, however, that something else is afoot beyond these things. They talk of a chance to express themselves, not being afraid to speak up, having the opportunity to follow any line or argument or any topic, to bring in real things from the real world. These comments are both rewarding to us and a commentary on their new images of their previous education. This means they have changed their conceptions of the relationship between students and teachers. They now expect a much less authoritarian posture in the role of teacher.

Some less obvious things about this first year are the eleven to eleven and a half months of work over sometimes largely unfamiliar combinations of materials; the new intellectual and emotional evaluation of one's role as a teacher; and the need to find solutions to problems in instruction that many in the past shunted off as the responsibility of someone else.

In surviving what at first glance appeared to be an insufferably complex series of relationships between college, project, and outside agency, the project demonstrated the validity of one of the crucial elements of the project, i.e., its interinstitutional aspect. There was worked out in an incredibly short period a way whereby the project faculties on thirteen campuses could benefit from each teacher's experience, whereby each campus could obtain support and guidance from the Curriculum Resources Group, and whereby the college administrators could air and share their questions and doubts not only about the project but, more importantly about curriculum matters in general. The existence of the project on each campus could not be ignored. Its mere existence has stimulated discussions of curriculum problems at the college or university levels. At no other point in the history of these institutions (or other groups of institutions, for that matter) has there been so useful a vehicle for the exchange of ideas and the sharing of problems for mutual benefit of all the colleges.

Review of the Second Year, at Midpoint

The first phase of the project was completed when each project gained acceptance on its

respective campus. This was not always an easy accomplishment. At most campuses the program was viewed as a small college operating within the body of a larger one, with almost parallel functions. ISE and the Directors were aware that it was possible for a program which was separately financed and to some extent externally directed to remain an experimental enclave surrounded by tradition. The experience of most colleges is best summed up in the words of one of the Directors. "At first, department and division chairmen were on the whole skeptical of, if not downright hostile toward, our program. This was the first time a program for curriculum change, with purpose, organization, materials equipment, and money invaded the campus. For a while, it remained literally isolated from the rest of the academic community."

This reaction to the project was overcome initially not so much by the quantified successes of the program as by apparent changes in the attitudes of students and teachers in the program. It was quite early noted that the project students seemed more enthusiastic and genuinely interested in their work. Librarians commented that project students were noticeably using the libraries more than regular students, both for services and for study. Project students' relationships with their non-project peers resulted in inquiries into the possibility for joining the project. Regular students borrowed the books of program students (often forgetting to return them), suggested their use in their own classes, and sought permission to attend classes in the program. The students in the program developed the attitude, expressed in academically relevant actions, that they were engaged in more worthwhile and engrossing work then were non-program students. Several directors report that second year students in non-program classes are more intellectually inquisitive and aggresive than their instructors would like.

Teacher attitudes have also played an important role in bringing the work of the project to the attention of the campuses. Quite apart from any quantified successes is the realization that they are involved in a major effort creating new excitement about general education. The summer conference has, in large part, been responsible for the generation of this new excitement.

Teachers appear to be more aware of the ambiguities inherent in the language of educational innovation and more discriminating and self conscious in their use of familiar jargon. Terms like "inductive," "student-centered," "discovery method," and "relevance" take on a visceral significance when they are a product of joint action. Teachers come to understand better than they did before the acts of creating flexible teaching situations, of using relevant materials, of operating in an unstructured classroom, of participating in the creation of a student-centered curriculum and of adopting inductive/discovery methods. Such actions require new attitudes. As teachers act under the critical evaluation of themselves and of their colleagues, they discover a continuing adjustment of some of their earlier traditional attitudes about teaching and students.

But before this course, can be generally accepted by the colleges, it must consider, the kinds of criticisms and problems raised by the regular department members. This certainly does not mean that the experimental courses must conform to the traditional aspects of the regular program. But it does mean that a part of the battle involves demonstrating good faith in academic matters. It would be presumptous for the Thirteen-College Directors, or ISE, or the college presidents, or the Federal Government to act as if the tangible products, i.e. the curriculum materials, are either adequate now in themselves or ever would be adequate in themselves to the task of establishing a new intellectual tradition based upon inductive-discovery methodologies, or, conversely, the modification of the attitudes of the colleges to the degree that will make these sorts of materials and methods acceptable to them.

All of the colleges have responded to the existence of a curriculum program on their campuses and to its inherent potential by placing each of the directors on whatever is its equivalent of an Academic Policies Committee. As members of such committees, the project directors are in a position to discuss the progress of the project and its implications for the college as a whole. Some specific suggestions discussed and agreed upon by the directors are:

1. Ask for a cooperative arrangement between a teacher in the program and a teacher of the same subject in the regular program. If agreeable, the program teacher could teach a unit in the regular class, with the cooperating teacher acting as a participant observer. At the end of the unit, the department head might be invited to sit with the two teachers when they discuss the results of the experiment.

2. Invite department heads to sit in on some of the program classes.

3. Ask regular faculty members with special skills or competencies to be resource persons.

4. Make loans of materials and equipment to designated teachers in the regular program.

5. At faculty or departmental meetings the curriculum program directors can present the Thirteen-College Curriculum Program methodology and attempt to see that it is reflected in scheduling, teacher loads, and student advisement plans.

6. Bring university officials to the Thirteen-College Curriculum Program to point up relationships between the program and the over-all institutional development. This will compel those responsible for institutional policies to think about institutional goals and commitment to those goals.

Love of Learning

This program is trying to answer some fundamental questions about self-charging education and how to start it. We are trying to find ways in which words and ideas and physical phenomena will become so important to students that their experience in manipulating these things becomes addictive, so that to be separated from ideas and their exploration brings on withdrawal symptoms.

We must not hesitate to search everywhere and anywhere for the point at which the experience of these students bisects the world of ideas, so that they can find analogues to their own being in many things . . . Who knows where that intersection may be?

Maybe in music – to hear one's inner voices coming back as if in an echo and to feel that's it, that's the way it is – maybe in Johann Sebastian Bach or Dizzy Gillespie, in Igor Stravinsky or Charlie Yardbird Parker, in Alberto Ginastera or John Coltrane – who knows where the intersection is.

Maybe it's in words to create the feeling of wanting to ingest them, to devour them, to manipulate them, to bend them to the needs of one's personal statements or to feel a playful joy at their effect on writer and listener –

> Look at that gal shake that thing.
> We cannot all be Martin Luther King.*

A whimsical line changed forever by backing into one of the great tragic moments of history.

We are in this program to create a feeling – a drive to find the ideas which order one's existence, which make whole the fragments of one's mind, to create a feeling about learning as that portrayed by the tragic dancer in The Red Shoes who when asked, "why do you dance?" Answers: "I must." Why does anyone teach himself – because he must.

Anyone who aspires to change the world or any part of it is at once a romantic and a visionary and a danger to the established order. And for lesser things men have been called fools and frauds.

To think that a black boy or girl from Tallahatchie, Mississippi, or Waycross, Georgia, or Triana, Alabama, 63rd and Cottage Grove, Chicago, or 125th and Lenox, New York, or from the fiercely respectable but non-intellectual working class can be involved in elegant flights of the mind could be visionary and romantic indeed.

"What we really need are trade schools by the gross or at the very least terminal junior colleges" – say the other voices.

> "Be practical" say still other voices.
> But who taught the black and unknown bards to sing?

A book has just been written called Pygmalion in the Classroom in which a psychologist in league with the principal of a grade school lied to teachers about the test labels of their students and the teachers made the lies come true. When a group was labeled as high ability, high performance was produced and when told they had low ability, low performance was produced, in each case they were random groups with equal abilities. And even more the teachers had nicer things to say about students who conformed to their expectations whether high or low. Their negative views of students who achieved above their expectations became even more so.

It appears behaviorial science is verifying what would appear to be folklore, namely, that what people believe about their students is likely to come true. Teachers must believe that elegant

*By Julian Bond from Rosey Pool's Beyond The Blues.

flights of the mind are possible or we will shape our goals to lesser possibilities.

The state of the project may be summed up as follows. One, the academic quality of what is being done is standing the close scrutiny of college faculties despite earlier skepticism. Two, the students who are now half in and half out of the program in their sophomore year show academic qualities that reinforce a positive view of the project. Three, the third year will be crucial in expanding the program to include more teachers and students, without higher horizons becoming lower horizons. Four, the college within a college idea must be continued as a laboratory center as implementations are generated. The project is well into the second half of the second year. It has travelled a good distance, but it is still on the uphill side of the task.

APPENDICES

Funding Agencies

(Support for the project depends upon yearly grants from public and private agencies – with the exception of the grant from the Carnegie Corporation which is for a longer period. Here is a list of the supporting agencies, and an explanation of how their money was spent, from the summer of 1967 through the summer of 1969.)

U.S. Office of Education (Division of College Support, Bureau of Higher Education) Washington, D.C.	Teachers' salaries and travel and curriculum materials for students (except Mary Holmes College); goes to colleges through Clark College.
U.S. Office of Education (Division of Higher Education Bureau of Research) Washington, D.C.	Staff for curriculum development in English, social science, and humanities ; evaluation of all subjects; management of Summer Conference; student participation in Summer Conference; goes to ISE
National Science Foundation (Special Projects Program, Division of Undergraduate Education in Science) Washington, D.C.	Staff for curriculum development in science and mathematics; management of Summer Conference; student participation in Summer Conference; goes to ISE.
Office of Economic Opportunity (Research and Demonstration, Community Action Programs) Washington, D.C.	Towards room, board, and stipends for students; goes directly to colleges. Also, teachers' salaries and curriculum materials for Mary Holmes College; goes through ISE
U.S. Office of Education (Educational Opportunity Grants, Division of Student Financial Aid, Bureau of Higher Education) Washington, D.C.	Matches OEO funds to meet tuition of students; goes directly to colleges.
The Ford Foundation (Special Projects) New York City	Two weekend conferences during academic year for entire project; goes to ISE.
Carnegie Corporation of New York New York City	Towards operation of central office of ISE.

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(Some funds supporting the project go to the colleges, other funds go to ISE.
Clark College coordinates some of the funds going to the colleges.)

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Was not Abraham Lincoln an extremist--

"We hold these truths to be self evident that all men are creat

Was not Thomas Jefferson an extremist--

"This nation cannot survive half slave and half free."

it--

marks of the Lord Jesus.'

Was not Amos an extremi

"I will