INDUSTRIAL ARTS IN THE PUBLIC SECONDARY SCHOOL

PROGRAMS FOR NEGROES IN NORTH CAROLINA
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PROGRAMS FOR NEGROES IN NORTH CAROLINA

A DISSERTATION

Presented in Partial Fulfillment of the Requirements
for the Degree Doctor of Philosophy in the
Graduate School of The Ohio State University

by

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THE OHIO STATE UNIVERSITY

1956

Approved by:

[Signature]
Adviser
Department of Education
DEDICATED TO

My wife Mary Rosalie and
my children Mary Ida
and Ralph Lee, Jr. for
their unselfish devotion,
patience, and encouragement
during the time this study
was being undertaken
This study concerns the status and projection of industrial arts in the public secondary school programs for Negroes in North Carolina. A check list was derived from a study of textbooks, state bulletins, government documents, seminar reports, and professional publications. Data were collected through personal observation of the thirty-six industrial arts programs involved. The results of the findings of the investigation were tabulated and tenable conclusions drawn.

To Professors William E. Warner, Dan H. Eikenberry, and Earl W. Anderson of The Ohio State University, I am deeply grateful for advice and suggestions in planning, developing, and completing this study. I am grateful to the teachers and principals of the thirty-six participating schools for the opportunity to visit and study their industrial arts programs. I wish to express my appreciation to the late Senator Clyde R. Hoey for procuring the census data for this study, and to the Greensboro Chamber of Commerce for supplying the data on industrial development in North Carolina.

I wish to thank my colleagues James R. Taylor, Assistant State Supervisor of Industrial Education for Negroes, for helping me in planning the visits and sharing the clerical facilities of his office, and Miss Alma I. Morron, Head Librarian, The North Carolina Agricultural and Technical College, for procuring related studies through the inter-library loan services.

November 15, 1955

RALPH LEE WOODEN
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Chapter I

THE PROBLEM IN PERSPECTIVE

This chapter sets the stage for the study of industrial arts in the public secondary school program for Negroes in North Carolina. It includes a background presentation of the origin and nature of the study, purposes and scope of the study, methods and techniques employed, statement of the problem, and definition of terms.

ORIGIN AND NATURE OF THE STUDY

The North Carolina Education Commission reports (45, 12) that the purpose of secondary education as thought of by parents and teachers is broad rather than limited and that they desire the school to assume the responsibility of fitting youth for those common responsibilities in life for which they are best suited. They desire that the high schools help youth to:

1. Develop the skills, understandings, and attitudes essential to making a living.
2. Maintain good health and physical fitness.
3. Understand the duties and responsibilities of citizens.
4. Learn how to purchase and use goods and services intelligently.
5. Master the attitudes, skills, and abilities necessary to good home and family life.
6. Understand the methods of science and the place of it in modern living.
7. Develop a capacity to appreciate good art, music, literature, and the wonders of nature.

8. Use leisure time wisely.

9. Develop a respect for other persons, and for moral and spiritual life.

10. Think rationally, express thought clearly, and read and listen with understanding.

There is a gap (45, 12) between what the high schools of North Carolina are doing to meet the needs of youth, and what parents and teachers would like to have them do. Some 20 percent of the beginning workers who have graduated from the high schools of the State, are trained for vocations, while 80 percent have no special preparation. The holding power of the large high schools is considerably greater than that of the small high schools. One student graduates out of every five in schools with ten or more teachers in comparison to one out of every twenty in schools with less than ten teachers. Some 80 percent of the seniors have no plan beyond graduation in both large and small high schools, and the curriculum in 15 percent of the high schools is not sufficiently varied or functional to meet the economic needs of youth.

PURPOSES AND SCOPE OF THE STUDY

These are to determine the status of industrial arts in the public secondary school programs for Negroes in North Carolina, and to develop a program in the light of acceptable criteria. The
ultimate objective of this study is to make recommendations for the improvement of industrial arts for Negroes in North Carolina.

This concerns the thirty-six secondary schools for Negroes listed in the State Directory for Industrial Arts and Vocational Education for 1955 (31) as follows:

<table>
<thead>
<tr>
<th>County</th>
<th>City</th>
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<tr>
<td>Alamance</td>
<td>Burlington</td>
<td>Jordan-Sellars</td>
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<td>Anson</td>
<td>Wadesboro</td>
<td>Training</td>
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<td>Beaufort</td>
<td>Washington</td>
<td>P. S. Jones</td>
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<td>Buncombe</td>
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<td>Cateret</td>
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<td>Duplin</td>
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<td>Durham</td>
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<td>Highland</td>
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<td>Granville</td>
<td>Creedmoor</td>
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<td>Oxford</td>
<td>Mary Potter</td>
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<td>Greene</td>
<td>Snow Hill</td>
<td>Training</td>
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<td>Guilford</td>
<td>Greensboro</td>
<td>J. C. Price</td>
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<td>William Penn</td>
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<td>Haywood</td>
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<td>Trenton</td>
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<td>Mecklenburg</td>
<td>Charlotte</td>
<td>Second Ward</td>
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<td>New Hanover</td>
<td>Wilmington</td>
<td>Williston Industrial</td>
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<td></td>
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<td>Williston Junior High</td>
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The study will focus on (1) the philosophy held for industrial arts, (2) the elements included in each industrial arts program, (3) the nature of the industrial arts curriculum, and (4) the physical setting provided for these programs.

METHODS AND TECHNIQUES

These include:

1. The report of the State Education Commission (45, 191) served as a basis for ascertaining the need for industrial arts in North Carolina Public Schools.
2. The Industrial Arts literature was searched for related studies. Two were found and are reported in Chapter II. They are:


3. A letter (Appendix A) was mailed to sixteen State Departments of Education having standards for Industrial Arts programs. Twelve responded and their publications are listed in the bibliography.

4. Publications of the United States Office of Education and the professional periodicals were read for background and content.

5. An outline was prepared and submitted to the writer's committee for approval.

6. A set of criteria for evaluating the industrial arts program of public secondary schools for Negroes in North Carolina was derived.

7. A check list was designed to serve as an instrument for investigating the industrial arts program in the schools.

8. A letter was drafted and mailed to the principals of the schools involved, asking permission to visit their industrial arts programs. A postal card was enclosed to facilitate their response.

9. A schedule was planned for visiting the programs involved.

10. Visits were made to the participating schools and data were recorded for each school.
11. The data were tabulated and compiled in suitable tables and the results interpreted.

12. Conclusions were drawn and recommendations made from the findings.

13. The study was submitted to the committee for review.

DEFINITION OF TERMS

Key words such as (1) industrial arts, (2) public secondary schools, (3) curriculum, (4) physical setting, (5) instruction and (6) laboratory activities are defined in order to make their meaning clear.

1. **Industrial Arts.** This is a phase of general education that concerns itself with the materials, processes, and products, and with the contributions of those engaged in industry. Learning comes through the pupil's experiences with tools and materials and through his study of the resultant conditions of life. It is a curriculum area rather than a subject or course, being comparable in this respect to agriculture.

2. **Public Secondary Schools.** This concerns those schools which offer industrial arts courses in grades 7, 8, 9, 10, 11, and 12 or those listed in the *North Carolina State Industrial Arts and Vocational Directory* of 1954.

3. **Curriculum.** This concerns the industrial arts program.

4. **Physical Setting.** This concerns the organization and arrangement of the laboratory and includes equipment as well as supplies and special features.
5. Instruction. This concerns any function or facility that serves to aid in developing habits, attitudes, skills, and understanding.

6. Laboratory Activities. This concerns industrial arts and the things in which the students participate in the schools studied.

The curriculums of the smaller high schools were more limited than those of the larger high schools. The smaller schools had a greater number of drop outs than the larger schools. The Commission recommended that more attention be given to occupational guidance, to the imperative needs of youth, and to the building of an adequate program of industrial arts.

STATEMENT OF THE PROBLEM

This study is concerned with:

1. Discovering the economic needs of North Carolina Negroes as to population distribution, occupational changes, and economic status.

2. Deriving a suitable philosophy of industrial arts education that is consistent with these "needs" in respect to origins that are biological, economic, political, cultural, and historical.

3. Presenting acceptable industrial arts principles and practices for secondary school programs as they relate to objectives, elements of the industrial arts program, curriculum, instruction, physical setting, organization and administration.
4. Designing an acceptable check list for analyzing the industrial arts programs studied with reference to the extent to which they are consistent with the derived principles and practices for industrial arts programs on the secondary school level.

5. Presenting the results and implications of the investigation in the findings, conclusions and recommendations.


Time, place, and setting have been discussed in this study. These were presented in order that one might gain a keener insight, broader understanding, and a crystallized picture of the problems involved in this study.

This study was found to be without precedent. Two studies were read, one by Phillips and the other by Harrison, and selected elements from each study are now presented in Chapter II.
Chapter II
REVIEW OF PREVIOUS STUDIES

Two dissertations concerning the Negro and industrial arts in the deep South have been made that relate to this study. They are now reviewed with reference to the findings and recommendations of this study.

THE DISSERTATION BY PHILLIPS (39)

This was read and the sections pertinent to industrial arts were selected from the chapters on purpose and scope, organization, findings and implications.

Purposes and Scope of the Study. The particular purposes of this study were: (1) to investigate the population and occupational shifts among Negro workers in the South Atlantic region, and (2) to plan a program of industrial education for them in keeping with the changes in their economic and social life. Phillips states that the economic status of the Negro is related to his occupational status. It is necessary to understand his economic life in order to get a clear perspective of what a program of general education as well as of specialized industrial education in the schools should be. The shift of the Negro from the country to the city, or from agricultural to industrial occupations, as well as his continual shift from one industrial occupation to another, provides implications for a total program of industrial education. The increasing need of the Negro to
consume a larger variety of industrial products, and his need for
to better housing make it important that a broad program of industrial
arts as well as industrial-vocational education be provided.

Organization. Phillips studied the following:

1. The South Atlantic region because of the density of the
Negro population, and the extensive integration of this group in all
phases of unskilled, semiskilled, and skilled work.

2. Population shifts such as the migration cityward. Trends
in the rural and urban Negro populations of the South as a whole, as
well as for states in this region are shown with their social, eco­
nomic, and educational implications.

3. Occupational changes among Negroes as given in the census
were shown for the decades 1920 and 1930.

4. Occupational changes were studied in various social-economic
groups, three of which were unskilled, semiskilled, and skilled, and
the implications for education noted for each.

5. Occupations were listed in each group in which the number
of Negroes is increasing and those in which they are decreasing.

6. An historical perspective of the progress or decline in
Negro workers in each social-economic group.

7. Attention was given in the chapter on skilled workers, to
the Negro in labor unions.

8. A summary of the industrial occupational changes among these
workers with implications for education, was presented with a discus­
sion of the implications for industrial arts in the secondary school.
9. The types of industrial arts curricula that should be offered are outlined.

10. The contributions of industrial arts to the total school program as well as to the specialized program of industrial-vocational education.

**Occupational Changes by Census Divisions.** Phillips reported:

1. The shift to manufacturing and mechanical industries was not restricted to recent years. Negroes have been in such industries since the days of slavery.

2. The movement to manufacturing has resulted in a concentration of Negroes in all industries where working conditions were unsatisfactory to whites and especially where the work is unusually heavy.

3. The number of Negro male workers in manufacturing and mechanical industries increased in each of the South Atlantic states except Virginia and West Virginia between 1920 and 1930. The decrease in Virginia might have been associated with the decrease in the population of this group.

4. Although some Negro males were represented in practically all manufacturing and mechanical industries, there were two industries, namely building construction and lumbering, where large numbers of men were engaged in all of the states.

5. The number of Negro female workers in manufacturing and mechanical industries was small and decreasing in five of the six states of the South Atlantic region.
6. The main reason for this increase in the number of Negro males employed in manufacturing and mechanical industries was the increase in the amount of such work in this region.

7. Five states were found to have an increase in the number of male workers in transportation and communications. Virginia had a decrease in these occupations.

8. All six states showed an increase in the number of male workers in the trades. The number of women in the trades decreased in four of the six states. The number employed in trade work was small. The increase in this field showed, however, that Negroes were entering a broader range of economic activities.

9. A survey of other census divisions showed large increases in the number of Negroes engaged in domestic and personal service and a significant decrease in the number engaged in clerical occupations and in public service.

10. Data on employment in these pursuits suggested the need for industrial arts courses to prepare youths to adapt themselves.

The Unskilled Negro Worker. Phillips found that:

1. Negroes had found increasing opportunities to do service work, laundering and longshoring.

2. Roughly from 60 to 70 percent of all males and approximately 80 percent of all females were employed as unskilled workers in both 1920 and 1930.
The Semiskilled Negro Worker. Phillips found that:

1. In each state studied there were large increases in the proportion of industrial workers in the semiskilled class. There were also significant gains in semiskilled female workers except in two of the six South Atlantic states.

2. Large numbers were engaged as chauffeurs, truck and tractor drivers, deliverymen, machine operatives in manufacturing, and in barbering.

3. There was a decrease in the number of male workers engaged as brakemen and as apprentices to hand and building trades. There was a decrease in the number of dressmakers and seamstresses and there was a surprising decrease in the number of hairdressers in some of the states.

4. The attitude of unions toward organizing semiskilled workers was similar to that of organizing skilled workers. That is, wherever Negroes were doing a large percentage of a type of work and offered strong competition, the policy was to include them in the unions concerned.

Negroes as Skilled Workers. Phillips found that:

1. Four of the South Atlantic states showed a decrease in the number of Negro skilled males from 1920 to 1930. In each of the South Atlantic states except West Virginia, the proportion of all skilled workers was smaller in 1930 than in 1920. There were practically no Negro female workers in the skilled class.
2. A few young Negro males were entering the skilled trades.

3. Negro male workers were engaged in practically all skilled occupations represented in the South Atlantic region. In the building trades, which represent a major field of employment, the number of painters, plasterers, and cement finishers increased, while the number of carpenters and bricklayers decreased.

4. In the crafts where Negroes excel in skill, they had little difficulty in joining unions. In some cases they were organized in separate unions and in some cases mixed locals. Skilled Negro workers, however, were generally unorganized.

**Occupational Changes in "White Collar" Groups.** Phillips found that:

1. There were few Negroes engaged in occupations which required technical industrial training.

2. The largest increase in professional service between 1920 and 1930 was shown in the number of Negro clergymen. Most of the professionals were engaged as clergymen, dentists, physicians, or teachers.

3. In the proprietary and managerial group, large numbers of Negroes were engaged as retail dealers, in insurance companies, and restaurants or cafes. The number of building contractors was increasing in two-thirds of the South Atlantic states.

4. The number and proportion of Negroes engaged as clerks and kindred workers in practically all the South Atlantic states is
decreasing. Most of these are employed as mail carriers, store clerks, and salesmen.

Implications for Industrial Arts. Phillips concluded that:

1. The cityward movement of Negroes with the problems associated with such a change creates needs for industrial arts instruction. They will work in industry and become consumers and producers of industrial products. The need for housing, recreational facilities and programs, and consumer education are examples of the needs of the migrant which suggest the need for industrial arts. They will live in houses, have more leisure, and will be appreciative of industrial design and culture.

2. The increase in the number engaged in manufacturing, transportation and communication, as well as the shift of large numbers to "white collar" jobs suggests a broad need for the orientation values of industrial arts.

Industrial Education in Negro Colleges. Phillips found that:

1. A study of the industrial arts teacher education programs showed that all of the colleges based their offerings upon assumptions reached by a local curriculum committee.

2. Four of the seven colleges encouraged their students to take several shop courses in the industrial arts curriculum rather than to specialize in one course. Such practice stimulates a broader offering of industrial arts in the secondary schools.
3. The range in requirements for a major in industrial arts teacher education in the colleges, was from 37 to 73 semester hours. The number of semester hours required for a major in the colleges indicated that the colleges had reasonably high standards.

The dissertation by Phillips was of material assistance in clarifying the data and the professional issues posed by the present dissertation.

THE DISSERTATION BY HARRISON (18)

Selected sections of this dissertation are reported concerning scope, procedures, findings, and recommendations. Harrison was concerned primarily with examining the industrial education programs in the high schools for Negroes in the State of Louisiana to ascertain:

1. To what extent the objectives of the programs were consistent with the needs of the individuals served.

2. To what extent the programs reflect the ever-changing social order in which the individuals must function.

3. To what extent the facilities and programs provide maximum effectiveness in achieving the results desired. These were determined by a study of their influence on the growth and development of the students. Such an examination would, of necessity, require wide observation of the students involved.

Harrison undertook to solve his problem as follows:

1. The development of a philosophy of education consistent with the nature of human development, the ideals of the culture in
which individuals grow and function, and the defensible principals of education that result.

2. The formulation of a yardstick or a set of criteria for an industrial education program based on the philosophy developed in step 1.

3. Gathering data on the status of industrial education programs for Negroes in the State of Louisiana. These were obtained concerning the twenty-one programs in Louisiana at the time. Twenty-six teachers and laboratories were involved. The methods used to secure the data were: (a) Visits to nineteen of the twenty-one programs studied to observe them in action. (b) Interviews held with principals and teachers to gain information on the philosophy held for each program.

4. Checking the data against evaluative criteria.

Findings. Harrison reported that:

1. Eighteen of the twenty-one schools studied did not have committees responsible for examining the policies or the scope of their industrial education programs.

2. The objectives of the industrial education program were not the result of seasoned planning.

3. Superintendents and principals played major roles in determining the nature of the industrial education programs studied.
Administrative Organization. He further reported that:

1. There was no evidence that the industrial education programs were considered as integral parts of the education program.

2. The participation of industrial education teachers in the planning of the high school program was non-existent.

3. The Negroes themselves,—teachers, principals, and laymen,—played a minor role in determining the goals and policies of the industrial education program. Major planning was done by the superintendents.

4. In conversations with high school principals it was discovered that they were confused as to the real meaning and values of industrial education. They valued the programs to the extent that they would contribute to the service needs of the rest of the school, especially as regards maintenance.

5. Little or no effort was made to solicit the cooperation of community groups in the planning and implementation of the programs. Two of the twenty-one programs invited and provided for the counsel of laymen in program planning.

Curriculum Emphasis

1. Six of the schools indicated that they had industrial arts and fifteen stated that they had vocational programs. However, both according to the testimonies of the teachers, were primarily concerned with developing tradesmen.
2. Skills in woodworking dominated the curriculum. Only one school provided experiences related to understanding the fundamentals of internal combustion engines. None provided for teaching electricity. Five of the six industrial arts programs provided activities in only one technical area. The other, a large high school in New Orleans, provided opportunities for the students to receive manipulative experiences in five areas—masonry, printing, auto mechanics, woodworking, and shoe repairing.

**Teaching Personnel**

1. About two-thirds (17 of 26) of the teachers were college graduates.

2. Fifteen of the twenty-six teachers stated that they did not possess a library. Eleven of the teachers did not subscribe to periodicals of any kind. Fifteen subscribed to the *Industrial Arts and Vocational Education* magazine.

3. None of the teachers were affiliated with any educational organizations. Few took part in local education planning and none participated in statewide planning of any kind.

4. Almost half (12 of 26) of the teachers received no technical training at the college level while nine reported they had not received any formal technical training. Fifteen of them were skilled in one technical area only, seven in two technical areas, and three in four areas. Twenty of the twenty-six teachers had work experience in their major fields.
**Student Personnel.** Only six schools provided opportunities for boys to participate in industrial arts activities. It was discovered that although these professed to have industrial arts programs, the objectives, methods, and curricula were similar to those found in the vocational program. In the fifteen vocational education programs all boys fourteen years of age and older were encouraged to enroll in "vocational" courses that were predominantly woodworking.

**Laboratory Arrangements.** The location of machinery and lack of auxiliary features were not conducive to achieving sound educational goals. The artificial illumination in most of the laboratories was less than eight footcandles and four of the laboratories had none. Little or no attention was given to the reflective properties of walls, ceilings, floors, and equipment.

**Auxiliary Facilities**

1. Nineteen of the shops were without provisions for demonstration.

2. Only twelve programs had libraries.

3. Only three programs had facilities for planning.

4. Any facilities for finishing, storage, and displaying the work of students were practically non-existent.

5. Nine of the shops were without power tools of any kind. These were found in the other twelve schools but in most cases were of the lightweight and cheapest type. Judging from the appearance of the hand tools, the users failed to care for them properly.
Laboratory Organization. Sixteen of the teachers in the schools studied stated that they used student personnel organizations for the purpose of administering the affairs of their respective programs. The activities of the student personnel system consisted of shop cleaning and the issuing of tools. These shop teachers did not capitalize on the values of the student personnel organization idea.

IMPLICATIONS FOR NORTH CAROLINA

These studies have served as guides for the development of the present dissertation. They suggest ways in which programs may be improved by leadership at the local and state level. They contain many suggestions for research and professional growth as a means for improving industrial education with implications for the improvement of industrial arts programs in Negro secondary school programs of North Carolina.
Chapter III

THE STATE OF NORTH CAROLINA

This chapter concerns the geography, economic resources, governmental organization, and educational program of the State of North Carolina, all of which concern the development of the industrial arts program in the public schools.

GEOGRAPHIC SETTING

North Carolina is popularly known as the "Old North State," and the "Tar Heel State." It is one of the South Atlantic group of the United States and lies between 33°50' and 35°36' North Latitude, and 75°27' and 84°20' West Longitude. It is bounded on the north by Virginia, on the east and southeast by the Atlantic Ocean, on the south and southwest by South Carolina and Georgia, and on the west and northwest by Tennessee. The total area of North Carolina is 52,712 square miles, including 3,670 square miles of water surface. The maximum breadth from north to south is 187 miles. It ranks twenty-seventh in size among the states.

Although a maximum altitude of 6,684 feet is reached on the summit of Mount Mitchell, the mean elevation is approximately 700 feet because nearly one-half of the State is made up of a low lying coastal plain. This is a broad, almost level area extending from the seacoast to the fall line (eastern edge of the Piedmont Plateau) and varying in width from 100 to 150 miles. Its extreme eastern boundary is a long narrow chain of islands known as the "banks" which have been
formed by shifting sand dunes, from which project three capes: Hatteras, Lookout and Fear. Between the banks and the shore, a chain of sounds, including Pampico and Albemarle, stretch along the State's 320 miles of seacoast. Bordering the sounds of the mainland are numerous swamps and marshes, including a portion of the Great Dismal Swamp, which extends into the State from Virginia.

The Piedmont Plateau, lying between the fall line and the mountains, is 60 to 75 miles wide and ranges in altitude from 500 to 1,500 feet. It consists mainly of rolling country, but is cut by numerous swift streams that issue from the mountains and continue into the coastal plain to form broad estuaries. Among those which enter the State from Virginia are the Roanoke, the Tar, the Pamplico, the Neuse, the Broad, the Catawba, and the Yadkin. The Blue Ridge, or Eastern Appalachian Chain, rises suddenly above the Piedmont.

Farther west is a plateau with elevations of 2,000 to 3,000 feet. Bordering this on the extreme west and north are the Stone, Iron, Unaka, Great Smoky, and Unicoi Mountains, which are a part of the Western Appalachian Chain. Both the Blue Ridge and Great Smokies as well as Mount Mitchell (6,615 feet) reach their highest points in western North Carolina. Because of its varied topography, North Carolina exhibits considerable variation in climate.

The mean annual temperature is 61° at Wilmington, in the Coastal Plain, with an average of 46° for January, and 79° for July. At Charlotte, it is 60°, with an average of 41° for January, and 72° for
July. The mean annual temperature for the State is 59°. The average annual precipitation is 49.6 inches, including 8.4 inches of snow. The average growing season is 239 days at Wilmington and 194 days at Charlotte.

Soil. North Carolina has an unusual variety of soils, and was one of the first states to undertake a systematic classification and mapping of its soil resources. In the Coastal Plain are sands, sandy loams, silt loam, and peat and muck soils. Extensive deposits of marl greatly increase the fertility of the soil in this region.

Guilford Court House and Moores Creek National Military Parks, located on scenes of Revolutionary battles are administered by the federal government, as is the Wright Memorial National Monument commemorating the first flight of a power-driven air plane at Kill Devil Hill.

Flora and Fauna. With its diversified topography and climate, North Carolina affords examples of nearly all the major types of vegetation found in the eastern United States, ranging from the palmetto and wild olive on the coast, to the rhododendron and laurel on the high mountain tops. Dogwood, the State flower, is widely distributed. Black bear and Virginia deer survive, both in the mountains and the swamps of the low country. Rabbits are most numerous of the small animals. Principal furbearing animals are fox, opposum, mink, and raccoon. The common gray squirrel ranges from one end of the State to the other, and the southern fox squirrel
is found on the swamp ridges and coastal islands. Birds are numerous in North Carolina, although many species noted by early naturalists are now rare. The dove, quail, and wild turkey are found widely, and migratory water fowl are plentiful.

The industrial arts program of North Carolina should be designed to reflect industry in relation to its strategic location, with national coastal outlets to the sea, improved roads, and growing airways. The geographic center of North Carolina is within a 500 mile radius of 50 percent of the population of the United States and the major industrial centers of the world.

ECONOMIC STATUS

The per capita income of North Carolina was $1,049 in 1952. This was fourth from the lowest on the national scale. The three states with less were, Alabama with $1012, Arkansas with $951, and Mississippi with $818.

The per capita income for the Southeastern Region comprising eleven states was $1,121 in 1952. It was $1,639 for the United States. North Carolina's per capita income is about 94 percent of the regional figure, but it is only 64 percent of the national figure. A study of Table I shows how these states and the three low-ranking western states compared with each other and with regional and national figures between 1929 and 1952. The competition to keep from being the low state on the economic totem pole is in the Southeastern Region. Delaware, with $2,260 was leading in the per capita
## Table I

**COMPARATIVE INCOMES BY STATES**

*Greensboro Record for June 15, 1954*

<table>
<thead>
<tr>
<th></th>
<th>1929</th>
<th>1933</th>
<th>1940</th>
<th>1950</th>
<th>1951</th>
<th>1952</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>$680</td>
<td>$368</td>
<td>$575</td>
<td>$1,440</td>
<td>$1,581</td>
<td>$1,639</td>
</tr>
<tr>
<td>Southeastern Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 States)</td>
<td>344</td>
<td>195</td>
<td>322</td>
<td>960</td>
<td>1,077</td>
<td>1,121</td>
</tr>
<tr>
<td>NORTH CAROLINA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alabama</td>
<td>$305</td>
<td>$154</td>
<td>$269</td>
<td>$847</td>
<td>$959</td>
<td>$1,012</td>
</tr>
<tr>
<td>Arkansas</td>
<td>305</td>
<td>152</td>
<td>254</td>
<td>821</td>
<td>918</td>
<td>951</td>
</tr>
<tr>
<td>Florida</td>
<td>464</td>
<td>272</td>
<td>468</td>
<td>1,201</td>
<td>1,277</td>
<td>1,319</td>
</tr>
<tr>
<td>Georgia</td>
<td>329</td>
<td>200</td>
<td>316</td>
<td>967</td>
<td>1,100</td>
<td>1,137</td>
</tr>
<tr>
<td>Kentucky</td>
<td>371</td>
<td>199</td>
<td>309</td>
<td>913</td>
<td>1,058</td>
<td>1,135</td>
</tr>
<tr>
<td>Louisiana</td>
<td>415</td>
<td>222</td>
<td>358</td>
<td>1,049</td>
<td>1,138</td>
<td>1,206</td>
</tr>
<tr>
<td>Mississippi</td>
<td>273</td>
<td>123</td>
<td>204</td>
<td>703</td>
<td>770</td>
<td>818</td>
</tr>
<tr>
<td>South Carolina</td>
<td>252</td>
<td>167</td>
<td>287</td>
<td>844</td>
<td>992</td>
<td>1,099</td>
</tr>
<tr>
<td>Tennessee</td>
<td>349</td>
<td>190</td>
<td>316</td>
<td>967</td>
<td>1,068</td>
<td>1,126</td>
</tr>
<tr>
<td>Virginia</td>
<td>422</td>
<td>266</td>
<td>446</td>
<td>1,147</td>
<td>1,272</td>
<td>1,322</td>
</tr>
<tr>
<td>New Mexico</td>
<td>383</td>
<td>196</td>
<td>356</td>
<td>1,133</td>
<td>1,297</td>
<td>1,331</td>
</tr>
<tr>
<td>North Dakota</td>
<td>389</td>
<td>190</td>
<td>372</td>
<td>1,273</td>
<td>1,370</td>
<td>1,223</td>
</tr>
<tr>
<td>South Dakota</td>
<td>417</td>
<td>172</td>
<td>379</td>
<td>1,275</td>
<td>1,492</td>
<td>1,258</td>
</tr>
</tbody>
</table>
income in the nation in 1952, while Nevada was second with $2,250.
Next in descending order were Connecticut with $2,080, New York with
$2,038, and California with $2,032.
Mecklenburg was ahead among the counties. According to estimates for 1952 by James S. Currie, Director of the State Department of Tax Research, Mecklenburg stood at $1,658, the only county to equal or exceed the national figure. Next in order were: Cabarrus with $1,558, Guilford with $1,478, Durham with $1,436, and Forsyth with $1,409. Currie's calculations were based on a study of estimates of individual income in the counties for 1947 made by Lowell D. Ashby and Everett P. Truax of the school of business administration at the University of North Carolina. These five top counties accounted for 17 percent of the population and 24 percent of income. Since the per capita figure for the State was $1,049, substantially lower than any of those counties, there were other areas obviously lower.

To get at the reason for North Carolina's comparatively low per capita income, several factors must be brought into proper relationship. Three of the primary ones are (a) kinds of business and industry, (b) the level of income in each field, and (c) the number of persons dependent on each.

North Carolina led the eleven Southeastern states in 1952 in total income payments to individuals from all sources, $4,383,000,000. She also led in population with an estimated 4,180,000, a number so large that the total income was only $1,049 per head. This was the fourth smallest amount per person for the 48 states.
This relatively low per capita income exists despite the fact that North Carolina can justifiably claim tremendous progress in developing a well balanced economy. The trouble is that major parts of this economy are the kind having somewhat lower levels of compensation for larger numbers of workers than may be found in most other states.

Agriculture is a case in point, because a substantial number of people in most Southeastern states depend directly on farming for their living. The income per person on the farm usually is much lower than a state's over-all per capita figure in this region. Using government figures the 1952 per capita net farm income for Mississippi was estimated at $391, for Virginia at $443, and for North Carolina at $485. In North Carolina farms were the source of 15 percent of total income which went to 33 percent of the population.

The estimated population, total income payments, and per capita income for 1952 are shown in the Greensboro Record for June 15, 1954 as follows:

<table>
<thead>
<tr>
<th>State</th>
<th>Population</th>
<th>Income in 1000s</th>
<th>Per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTH CAROLINA</td>
<td>4,180,000</td>
<td>$4,383,000</td>
<td>$1,049</td>
</tr>
<tr>
<td>Alabama</td>
<td>3,051,000</td>
<td>3,089,000</td>
<td>1,012</td>
</tr>
<tr>
<td>Arkansas</td>
<td>1,876,000</td>
<td>1,786,000</td>
<td>951</td>
</tr>
<tr>
<td>Florida</td>
<td>3,100,000</td>
<td>4,088,000</td>
<td>1,319</td>
</tr>
<tr>
<td>Georgia</td>
<td>3,515,000</td>
<td>3,998,000</td>
<td>1,137</td>
</tr>
<tr>
<td>Kentucky</td>
<td>2,916,000</td>
<td>3,311,000</td>
<td>1,135</td>
</tr>
<tr>
<td>Louisiana</td>
<td>2,816,000</td>
<td>3,396,000</td>
<td>1,206</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2,173,000</td>
<td>1,778,000</td>
<td>818</td>
</tr>
<tr>
<td>South Carolina</td>
<td>2,130,000</td>
<td>2,341,000</td>
<td>1,099</td>
</tr>
<tr>
<td>Tennessee</td>
<td>3,257,000</td>
<td>3,669,000</td>
<td>1,126</td>
</tr>
<tr>
<td>Virginia</td>
<td>3,498,000</td>
<td>4,322,000</td>
<td>1,222</td>
</tr>
</tbody>
</table>
Table II shows major sources of income in percentage of the total in each state. Comparisons between 1940 and 1952 indicate trends directly influencing the income situation.

Table II

MAJOR SOURCES OF INCOME, AS PERCENT OF TOTAL INCOME
Greensboro Record for June 15, 1954

<table>
<thead>
<tr>
<th></th>
<th>Farm 1940</th>
<th>Farm 1952</th>
<th>Government 1940</th>
<th>Government 1952</th>
<th>Trade &amp; Ind. 1940</th>
<th>Trade &amp; Ind. 1952</th>
<th>Other 1940</th>
<th>Other 1952</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>7.2</td>
<td>6.7</td>
<td>14.5</td>
<td>15.9</td>
<td>45.8</td>
<td>50.1</td>
<td>32.5</td>
<td>27.3</td>
</tr>
<tr>
<td>S. E. Region</td>
<td>15.2</td>
<td>11.5</td>
<td>16.4</td>
<td>20.3</td>
<td>40.7</td>
<td>42.8</td>
<td>27.7</td>
<td>25.4</td>
</tr>
<tr>
<td>NORTH CAROLINA</td>
<td>17.4</td>
<td>15.4</td>
<td>13.6</td>
<td>16.1</td>
<td>46.6</td>
<td>48.7</td>
<td>22.4</td>
<td>19.8</td>
</tr>
<tr>
<td>Alabama</td>
<td>14.5</td>
<td>10.0</td>
<td>16.0</td>
<td>22.6</td>
<td>43.5</td>
<td>54.3</td>
<td>26.0</td>
<td>23.1</td>
</tr>
<tr>
<td>Arkansas</td>
<td>30.0</td>
<td>22.0</td>
<td>17.1</td>
<td>18.3</td>
<td>32.0</td>
<td>36.7</td>
<td>20.9</td>
<td>23.0</td>
</tr>
<tr>
<td>Florida</td>
<td>8.3</td>
<td>7.5</td>
<td>15.9</td>
<td>20.2</td>
<td>38.8</td>
<td>40.5</td>
<td>37.0</td>
<td>31.8</td>
</tr>
<tr>
<td>Georgia</td>
<td>15.7</td>
<td>9.5</td>
<td>15.8</td>
<td>21.0</td>
<td>43.2</td>
<td>46.6</td>
<td>25.3</td>
<td>22.9</td>
</tr>
<tr>
<td>Kentucky</td>
<td>15.7</td>
<td>11.9</td>
<td>15.8</td>
<td>19.2</td>
<td>35.5</td>
<td>38.2</td>
<td>32.9</td>
<td>30.7</td>
</tr>
<tr>
<td>Louisiana</td>
<td>10.2</td>
<td>9.4</td>
<td>16.5</td>
<td>20.2</td>
<td>38.1</td>
<td>38.9</td>
<td>35.2</td>
<td>31.5</td>
</tr>
<tr>
<td>Mississippi</td>
<td>27.6</td>
<td>24.1</td>
<td>29.0</td>
<td>21.1</td>
<td>32.2</td>
<td>36.2</td>
<td>21.2</td>
<td>18.6</td>
</tr>
<tr>
<td>South Carolina</td>
<td>18.2</td>
<td>11.0</td>
<td>19.2</td>
<td>19.7</td>
<td>44.1</td>
<td>44.6</td>
<td>18.5</td>
<td>24.7</td>
</tr>
<tr>
<td>Tennessee</td>
<td>14.4</td>
<td>9.6</td>
<td>15.8</td>
<td>18.0</td>
<td>44.2</td>
<td>47.7</td>
<td>25.6</td>
<td>24.7</td>
</tr>
<tr>
<td>Virginia</td>
<td>9.8</td>
<td>7.9</td>
<td>18.6</td>
<td>26.3</td>
<td>40.8</td>
<td>40.8</td>
<td>30.8</td>
<td>25.0</td>
</tr>
</tbody>
</table>

Farm income is net return of farm proprietors, farm wages, and rents to landlords living on farms. Government income includes pay
of local, state, and federal employees, armed forces, military allotments, interest, relief checks, social security benefits, and similar items. Trade and service income consists of wages and salaries, and proprietors' income.

The movement from farm to factory has greatly influenced the income situation. North Carolina moved from farm to factory earlier than the other Southeastern states with the result that there is more room for development in them. This raises the question: Why are most of these states, at a lower level of development than North Carolina, already running ahead of this state in per capita income? One reason has already been mentioned,—low farm income spread over a large segment of the population. Another is that a good deal of North Carolina's industry is of the kind that pays less than peak wages. Still another is that North Carolina, in contrast to several of the other states in the region, lacks natural resources in volume sufficient for broadly profitable development.

Two sets of figures will serve to indicate North Carolina's industrial position, which in turn reflects its position as to natural resources. The first, somewhat general, shows the average weekly earnings from all manufacturing in the eleven states for 1952: Alabama, $52.53; Arkansas, $47.20; Florida, $53.43; Georgia, $47.88; Kentucky, $62.73; Louisiana, $59.22; Mississippi, $45.45; NORTH CAROLINA, $47.67; South Carolina, $47.88; Tennessee, $54.67; and Virginia, $53.47. Only two states, Arkansas and Mississippi, have lower averages than North Carolina,—and this state is the most highly industrialized in the South.
The second set of figures is more specific. It shows the average gross weekly earnings of production workers and nonsupervisory employees in a number of the more important industries of the South-eastern region. This is followed by a list showing the industries which play major roles in the economy of each of the eleven states. The earnings, it should be noted, are for the nation, and it should be kept in mind that averages frequently vary from one region to another.

**Weekly Earnings**

Mining: Bituminous coal, $78.32; metal mining, $81.65; non-metallic mining and quarrying, $71.10; petroleum and natural gas production, $85.90.

Construction: $87.85.

Manufacturing: Steel, $79.60 at blast furnaces, steel works, and rolling mills, and $72.22 at iron and steel foundries; metal fabrication, $72.38; natural gas and petroleum refining, $88.44; general tobacco manufactures, $44.93; cigars, $40.13, cigarettes, $56.45; textiles, $53.18; furniture, $58.93 in household field, and $68.36 in office and professional field; chemicals and allied products, $70.45; lumber and wood products, $63.45; shipbuilding, $75.17; pulp, paper and paperboard mills, $78.68; food and allied, $63.23.

**Industrialization**

Alabama: Steel and iron, chemicals.

Arkansas: Petroleum and natural gas production and refining, metal mining, lumber and wood products, furniture, paper.
Florida: Lumber and wood products, cigars.

Georgia: Lumber and wood products, food and related products, metal fabrication, textiles.

Kentucky: Bituminous coal mining, food processing, metal fabrication, lumber and wood products, furniture, chemicals, general tobacco manufactures.

Louisiana: Petroleum and natural gas production and refining, nonmetallic mining, chemicals, lumber and wood products, pulp and paper, food processing.

Mississippi: Lumber and wood products, food processing, textiles.

NORTH CAROLINA: Textiles, cigarettes, furniture, lumber and wood products. (Currie pointed out that as of March, this year, textile mills employed 226,700 of the 431,000 Tar Heels employed in manufacturing. It was the largest single component.)

South Carolina: Textiles, lumber and wood products, food processing.

Tennessee: Nonmetallic mining and quarrying, metal mining, textiles, chemicals, food processing, metal fabrication, lumber, furniture, paper.

Virginia: Bituminous coal mining, quarrying, general tobacco products, cigarettes, textiles, chemicals, shipbuilding, lumber and wood products, food processing, metal fabrication.

What is the outlook for the State? "The sad part of it is," says Currie, "that we've got to do better to hold the position we have. Among other things, that means keeping our own industry here."
What can be done? Currie sees it this way, at least in part:
"We need to diversify our industry to include those requiring higher
degrees of skills because they pay better."

**Economic Resources, Minerals and Mining.** Of the State's more
than three hundred minerals, not one supports a major industry. The
most valuable are clays, building stone, sand and gravel, mica, and
feldspar.

The Piedmont is a region of stiff clays which tends to become
more sandy as they approach the Coastal Plain. The soils of the
mountain regions are sandy loams, clays, and clay loams with consider­
able rough stony land and rock which is not suited for farming.

**Forests and Parks.** Forests cover 58 percent of the State's
total land area, and contain more varieties of trees than any other
state except Florida and Texas. The Southern forest belt, including
the entire Coastal Plain and extending into the Piedmont, is dominated
by second-growth longleaf and loblolly pine with oak, hickory, ash,
sweetgum, and blackgum in the bottom. Gum cypress, and white cedar
are found deeper in the swamplands. The central hardwood belt of
the Piedmont Plateau contains red and white oak, hickory, and yellow
poplar, with second growth pine returning to areas that formerly were
cultivated. The Northern Forest of the Mountain Region has mixed
hardwood growth with some spruce, hemlock, white pine, and three
species of yellow pine. Four national forests,- Croatan, Awhaire,
Pisgan, and Natuhala, totaling 3,593,436 acres of the Great Smoky
Mountains National Park extend across the border from Tennessee. Twelve state parks and recreational areas are maintained by the State Department of Conservation and Development. Included in one of these is Mount Mitchell, the highest point in the Eastern United States.

The State normally ranks first in the production of feldspar, mica, and residual kaolin clays, second in the production of granite, and eighth in the manufacture of clay products. The only known commercial deposit of pyrophyllite in 1950 was in North Carolina. Tungsten is mined, also coal in limited quantity. Mineral production in the State totaled $23,699,000 in value in 1946, an amount which ranked North Carolina thirty-sixth among the states. The principal mineral products in 1946 were clay products: stone, $8,232,000; sand and gravel, $7,561,167; talc and pyrophyllite, $2,956,800; clay, $1,186,463; feldspar (crude), $1,314,976; scrap mica, $1,081,514; and sheet mica, $484,275.

Agriculture. There were 18,617,932 acres devoted to farming in 1945, about 59 percent of the total land area of North Carolina. Of these, 6,169,526 acres were crop land, 906,073 idle land, 2,718,031 pasture land, and 9,199,026 woodland. The number of farms was 287,412. In 1945, the total value of farm property was estimated at $1,243,711,575, of which $1,002,983,012 was represented by machinery, and $144,247,857 by domestic animals.

Cash receipts from marketed crops in 1949 totaled $570,421,000. The State ranked third among the states in this respect, and first
in the production of tobacco. Table III shows the leading crops for 1949.

<table>
<thead>
<tr>
<th>Product</th>
<th>Communities Involved</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley</td>
<td>36</td>
<td>900 bu.</td>
</tr>
<tr>
<td>Corn</td>
<td>2,159</td>
<td>75,565 bu.</td>
</tr>
<tr>
<td>Cotton Lint</td>
<td>815</td>
<td>270 bales</td>
</tr>
<tr>
<td>Hay</td>
<td>1,205</td>
<td>1,395 tons</td>
</tr>
<tr>
<td>Oats</td>
<td>370</td>
<td>11,100 bu.</td>
</tr>
<tr>
<td>Peanuts</td>
<td>236</td>
<td>236,000 lb.</td>
</tr>
<tr>
<td>Potatoes</td>
<td>61</td>
<td>7,869 bu.</td>
</tr>
<tr>
<td>Rye</td>
<td>19</td>
<td>200 bu.</td>
</tr>
<tr>
<td>Soy Beans</td>
<td>264</td>
<td>3,960 bu.</td>
</tr>
<tr>
<td>Sweet Potatoes</td>
<td>52</td>
<td>5,876 bu.</td>
</tr>
<tr>
<td>Tobacco</td>
<td>111</td>
<td>147,630 lb.</td>
</tr>
<tr>
<td>Wheat</td>
<td>445</td>
<td>5,785 bu.</td>
</tr>
</tbody>
</table>

Truck crops included cucumbers, snap and lima beans, cabbage, watermelons, cantaloupes, peaches, apples, strawberries, and pecans.

Table IV shows the receipts from livestock and poultry in North Carolina for 1949.
### Table IV
RECEIPTS FROM LIVESTOCK AND POULTRY
IN NORTH CAROLINA, 1949
*Collier's Encyclopedia* for 1950

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Number</th>
<th>Receipts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cows and Heifers</td>
<td>372,000</td>
<td>$48,732,000</td>
</tr>
<tr>
<td>Swine</td>
<td>1,167,000</td>
<td>33,960,000</td>
</tr>
<tr>
<td>Sheep</td>
<td>35,000</td>
<td>602,000</td>
</tr>
<tr>
<td>Horses</td>
<td>85,000</td>
<td>8,245,000</td>
</tr>
<tr>
<td>Mules</td>
<td>271,000</td>
<td>51,939,000</td>
</tr>
<tr>
<td>Chickens</td>
<td>10,847,000</td>
<td>16,270</td>
</tr>
<tr>
<td>Turkeys</td>
<td></td>
<td>434,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>433,928,270</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Fisheries.** About twenty-five kinds of fish are taken from North Carolina waters, in addition to fish used in the production of oil and vitamin products, and shellfish. Cape Hatteras marks the dividing line between the cold-water fish and those of the waters affected by the Gulf Stream; fishermen in this state, therefore, secure both types. The fish taken include shad, herring, gray and spotted trout, mullet, florneles, and spot. The principal shell fish are shrimp, oysters, crabs, and clams. Great quantities of menhaden are taken and used for fertilizer. In 1950 there were nine fish hatcheries in the State.

**Industry.** North Carolina has a diversified industry. The State's economy is well balanced between agriculture and
manufacturing. Other important industry groups include paper and allied products, the printing and publishing industries, chemicals and allied products, stone, clay, and glass products, leather and leather products, fabricated metal products, machinery (not including electrical), primary industries, transportation equipment, instruments and related products.

North Carolina led the nation in the manufacture of textiles, tobacco products, wood, and furniture production, and was the South's third ranking lumber producer in 1949. North Carolina ranked second in the South in electric power output in 1949. In that year, production for all purposes totaled 10,010,400 kilowatt hours, and the major portion of this originated from fuels rather than water power at hydro-electric plants. Table V shows the leading North Carolina industries as of 1947.

Table V
LEADING NORTH CAROLINA INDUSTRIES IN 1947
Collier's Encyclopedia for 1950

<table>
<thead>
<tr>
<th>Industry</th>
<th>Employees</th>
<th>Wages in 1000s</th>
<th>Manufacture in 1000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textile Mill Products</td>
<td>210,380</td>
<td>$417,617</td>
<td>$846,280</td>
</tr>
<tr>
<td>Tobacco Manufactures</td>
<td>32,452</td>
<td>65,767</td>
<td>257,986</td>
</tr>
<tr>
<td>Lumber and Products (except Furniture)</td>
<td>31,087</td>
<td>47,289</td>
<td>84,127</td>
</tr>
<tr>
<td>Furniture and Fixtures</td>
<td>27,858</td>
<td>53,865</td>
<td>102,447</td>
</tr>
<tr>
<td>Food, Related Products</td>
<td>16,716</td>
<td>34,937</td>
<td>78,430</td>
</tr>
<tr>
<td>Apparel, Related Products</td>
<td>16,644</td>
<td>27,868</td>
<td>43,852</td>
</tr>
</tbody>
</table>
Transportation. There were thirty-four railroads in the State in 1949, operating 4,554 miles of track. The four principal carriers are the Southern Railway System, the Atlantic Coast Line, the Seaboard, and the Norfolk Southern. There are 64,546 miles of surface treated or graveled highway. There are ocean-shipping port facilities at Wilmington and Morehead City, and the Island Waterway carries both freight and pleasure craft. There were 151 airports in the State as of January 1, 1949, of which 93 were commercial and 58 municipal.

GOVERNMENTAL ORGANIZATION

The present constitution dates from 1868, but has been amended. The General Assembly, meeting biennially in sessions of unlimited duration, is composed of a Senate of 50 members and a House of Representatives of 120 members, elected for two year terms. The Governor is chosen for a term of four years and is ineligible to succeed himself. He is the only governor in the United States not having veto power. Other State officials include a Lieutenant Governor, Secretary of State, Auditor, Treasurer, Superintendent of Public Instruction, Commissioner of Labor, Agriculture, and Insurance, and the Attorney General. Judicial power is vested in a Supreme Court of seven members, elected for eight year terms. One hundred superior courts are located in twenty-one districts, each having a Resident Judge elected for an eight year period, and numerous Justices of the Peace.

Throughout most of its history, North Carolina has been predominantly Democratic, and since 1900 solidly so, except for the State's electoral vote for Herbert Hoover, Republican, in 1928.
The Governor in 1955 is Luther H. Hodges, Democrat. The State's two United States Senators are, W. Kerr Scott and Samuel J. Erwin, Jr., both Democrats, as are North Carolina's twelve Congressional Representatives.

Finance and Banking. General revenue and borrowings, according to the Compendium of State Government Finance published by the United States Department of Commerce in 1948, amounted to $225,512,000. This included $213,934,000 from taxes and $29,331,000 in aid received from other governments. The tax total of $213,934,000 included $18,540,000 from unemployment compensation; $103,052,000 from gross receipts; $26,773,000 from license and privilege; $24,304,000 from individual income; $34,280,000 from corporation income; $4,078,000 from property; and $1,907,000 from death and gifts, and other such sources.

The tax total of $103,052,000 from sales, use, and gross receipts included $40,699,000 from motor vehicle fuels, $10,145,000 from alcoholic beverages, $4,169 from insurance companies, and $19,149,000 from public utilities. The license and privilege tax total of $26,773,000 included $14,952,000 from vehicle operators, $3,482,000 from corporations in general, $123,000 from alcoholic beverages, $809,000 from hunting and fishing, $286,000 from occupations, $215,000 from chain stores, and $425,000 from amusements and race tracks.

General expenditure, according to the same source totaled $225,051,000 in 1948, providing $5,595,000 for retirement, $122,150
for operation, $48,293,000 for capital outlay, $21,718,000 for interest, and $25,332,000 in contributions to trust funds and enterprises, including $18,540,000 for unemployment compensation funds. General expenditure for operation capital outlay, and aid paid to local governments, amounting to $192,161,000 included $59,954,000 for highways, $2,512,000 for health, $10,273,000 for hospitals and institutions for the handicapped, $13,439,000 for public welfare, and $82,232,000 for schools. The gross and general debt at the end of the fiscal year of 1948 was $84,190,000.

North Carolina in 1947 had a total of 226 banks having total deposits amounting to $1,886,700,000 and total assets or liabilities of $2,007,000,000. There were 45 national banks having total assets or liabilities of $552,927,000, and 181 state banks and trust companies having combined assets of $1,484,047,000 and deposits totaling $1,392,579,000.

Industrial arts programs should study the financial structure of the State in order to determine its relationship to industrial growth and development. Millions of dollars are invested in the establishment of industries as well as reinvested for expansion, growth and development. The tax base for a State is directly dependent on the income and financial status.

Table VI shows the national rank of North Carolina educationally for 1949-50.
### Table VI

**HOW NORTH CAROLINA RANKS AMONG THE STATES ON CERTAIN EDUCATIONAL ITEMS, 1949-50**  
*Greensboro Daily News for February 23, 1953*

<table>
<thead>
<tr>
<th>Item</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average cost per pupils transported, $15.98</td>
<td>1</td>
</tr>
<tr>
<td>Receipts from State sources, 78.6%</td>
<td>3</td>
</tr>
<tr>
<td>Pupils transported, 45.8%</td>
<td>4</td>
</tr>
<tr>
<td>Population enrolled, 21.7%</td>
<td>6</td>
</tr>
<tr>
<td>Average number of days attended per pupil, 62.2%</td>
<td>11</td>
</tr>
<tr>
<td>Enrolled pupils attending, 90.2%</td>
<td>16</td>
</tr>
<tr>
<td>Enrolled population 5-17 years of age, 84.9%</td>
<td>19</td>
</tr>
<tr>
<td>Average annual salary, $2,688</td>
<td>30</td>
</tr>
<tr>
<td>Expenditure per capita for those 5-17 years, $145.22</td>
<td>41</td>
</tr>
<tr>
<td>Expenditure per pupil, $140.82</td>
<td>41</td>
</tr>
<tr>
<td>Daily expenditure per pupil, 99¢</td>
<td>41</td>
</tr>
<tr>
<td>Value of property per pupil, $261</td>
<td>41</td>
</tr>
<tr>
<td>Value of property per pupil in average daily attendance, $290</td>
<td>41</td>
</tr>
<tr>
<td>Value of property per capita of those 15-17 years, $222</td>
<td>41</td>
</tr>
<tr>
<td>Average daily attendance</td>
<td>45</td>
</tr>
</tbody>
</table>

In spite of the high percentage of current receipts from State sources, North Carolina ranks low in many items. This is to be expected when reflected against a low per capita income for the State.
All public elementary and high schools in North Carolina are financed directly by the State with a nine month school term guaranteed by the act of 1943. Education in North Carolina is compulsory for children from ages seven to sixteen. White, Negro, and Indian children are segregated. In 1947-48 there were 3,158 public elementary schools enrolling 164,432 pupils.

State institutions of higher learning include the consolidated University of North Carolina consisting of three units, the University of North Carolina at Chapel Hill, the State College of Agriculture and Engineering at Raleigh, and the Women's College at Greensboro; colleges at Greenville, Boone, and Collowhee; for Negroes, North Carolina College at Durham, the Agricultural and Technical College at Greensboro, and Teachers' Colleges at Elizabeth City, Fayetteville, and Winston-Salem; and for Indians, the State College at Pembroke.

Private and church supported institutions for whites include Duke University at Durham, Wake Forest College at Wake Forest, Davidson College at Davidson, Catawba College at Salisbury, Lenoir-Ryne College at Hickory, Guilford College near Greensboro, Meredith College at Raleigh, and Greensboro College at Greensboro, the last two being exclusively for women.

Church supported institutions for Negroes are Saint Augustine College and Shaw University, both at Raleigh; Johnson C. Smith University at Charlotte; Bennett College and Immanuel Lutheran College
at Greensboro; Livingstone College at Salisbury; Barber Scotia at Concord.

**Social Welfare.** Correctional and other public welfare institutions are administered by various boards and commissions. The State Board of Correction and Training maintains an industrial training school for delinquent white boys at Rocky Mount, an industrial farm colony for women at Kinston, a home for wayward girls at Samarcand, a manual training school for Negro boys at Hoffman, and one for Negro girls at Rocky Mount. The State Hospital Board of Control has the management of a school for white defectives at Kinston, hospitals for the white insane at Raleigh and Morganton, and a hospital for the Negro insane at Goldsboro.

Schools are maintained for white blind persons at Raleigh and Morganton, and for blind and deaf Negroes at Raleigh. State orphanages for both white and Negro children are located at Oxford. An orthopedic hospital is maintained at Gastonia and there are sanatoriums for treatment of tuberculosis at Black Mountain and Wilson. A home for Confederate women is still maintained at Fayetteville.
Chapter IV
THE NEGRO CITIZEN OF NORTH CAROLINA

This chapter reports an investigation of the Negro citizen of North Carolina with reference to his education and employment.

POPULATION

Table VII presents the population according to age and sex for 1950 as shown in bulletin p-c 33, table 53, page 169, for 1952.

Table VII
AGE AND SEX OF NEGROES IN NORTH CAROLINA
U. S. Bureau of the Census

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>All ages</td>
<td>509,380</td>
<td>538,505</td>
<td>1,047,885</td>
</tr>
<tr>
<td>Under 5</td>
<td>75,050</td>
<td>74,005</td>
<td>149,055</td>
</tr>
<tr>
<td>10 to 14</td>
<td>63,715</td>
<td>56,930</td>
<td>120,645</td>
</tr>
<tr>
<td>15 to 19</td>
<td>49,470</td>
<td>52,370</td>
<td>101,840</td>
</tr>
<tr>
<td>20 to 24</td>
<td>42,530</td>
<td>48,800</td>
<td>91,330</td>
</tr>
<tr>
<td>25 to 29</td>
<td>39,075</td>
<td>42,900</td>
<td>81,975</td>
</tr>
<tr>
<td>30 to 34</td>
<td>38,140</td>
<td>36,035</td>
<td>74,175</td>
</tr>
<tr>
<td>35 to 39</td>
<td>32,720</td>
<td>37,040</td>
<td>69,760</td>
</tr>
<tr>
<td>40 to 44</td>
<td>27,325</td>
<td>29,945</td>
<td>57,270</td>
</tr>
<tr>
<td>45 to 49</td>
<td>22,525</td>
<td>25,030</td>
<td>47,555</td>
</tr>
<tr>
<td>50 to 54</td>
<td>14,055</td>
<td>19,935</td>
<td>33,990</td>
</tr>
<tr>
<td>55 to 59</td>
<td>14,035</td>
<td>14,520</td>
<td>28,555</td>
</tr>
<tr>
<td>60 to 64</td>
<td>11,000</td>
<td>11,285</td>
<td>22,285</td>
</tr>
<tr>
<td>65 to 69</td>
<td>10,680</td>
<td>11,925</td>
<td>22,605</td>
</tr>
<tr>
<td>70 to 74</td>
<td>6,555</td>
<td>6,880</td>
<td>13,435</td>
</tr>
<tr>
<td>75 to 79</td>
<td>3,510</td>
<td>3,865</td>
<td>7,375</td>
</tr>
<tr>
<td>80 to 84</td>
<td>1,655</td>
<td>1,960</td>
<td>3,615</td>
</tr>
<tr>
<td>85 and over</td>
<td>855</td>
<td>1,470</td>
<td>2,325</td>
</tr>
</tbody>
</table>

The Negro population comprises approximately one-fourth of the total. About 75 percent of these are employed on farms or in related
activities. This accounts in part for the low total average income of $714 per year. This is 43 percent of the national average of $1639 and 64 percent of the state average of $1049.

These facts indicate the need for a type of education that will contribute to raising the average income. These facts also explain the exodus of so many farm youth to urban settings and industrial employment and again indicate the role to be played by the school with reference to a strong program in the industries from the primary grades through the secondary school.

EDUCATIONAL PROVISIONS

Table VIII shows an increase of 4 to 6 percent in school by age groups from 5 to 24.

Table VIII

NEGRO SCHOOL ENROLLMENTS BY AGE IN 1940 AND 1950
U. S. Bureau of the Census

<table>
<thead>
<tr>
<th>Age</th>
<th>1940 Population</th>
<th>1940 Number</th>
<th>1940 Percent</th>
<th>1950 Population</th>
<th>1950 Number</th>
<th>1950 Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 24</td>
<td>1,545,805</td>
<td>845,492</td>
<td>54</td>
<td>1,529,990</td>
<td>894,985</td>
<td>58</td>
</tr>
<tr>
<td>5 to 6</td>
<td>156,782</td>
<td>40,133</td>
<td>26</td>
<td>178,105</td>
<td>53,275</td>
<td>30</td>
</tr>
<tr>
<td>7 to 13</td>
<td>547,013</td>
<td>520,952</td>
<td>95</td>
<td>556,840</td>
<td>531,280</td>
<td>95</td>
</tr>
<tr>
<td>14 to 15</td>
<td>161,555</td>
<td>134,912</td>
<td>84</td>
<td>147,875</td>
<td>133,955</td>
<td>90</td>
</tr>
<tr>
<td>16 to 17</td>
<td>161,476</td>
<td>89,402</td>
<td>55</td>
<td>145,825</td>
<td>95,550</td>
<td>65</td>
</tr>
<tr>
<td>18 to 19</td>
<td>163,245</td>
<td>35,564</td>
<td>22</td>
<td>146,190</td>
<td>45,750</td>
<td>31</td>
</tr>
<tr>
<td>20 to 24</td>
<td>355,734</td>
<td>14,529</td>
<td>4</td>
<td>355,155</td>
<td>35,175</td>
<td>10</td>
</tr>
</tbody>
</table>
Table IX presents the amount of education completed by persons
25 years of age and over according to the census for 1950. The
median number of school years completed in 1950 of 5.9 was .8 above
1940 when the figure was 5.1. The median school years for the
State as a whole, however, was 7.9.

Table IX
EDUCATION ACHIEVED BY THOSE OVER 25 YEARS OF AGE
State Department of Public Instruction

<table>
<thead>
<tr>
<th>Grades</th>
<th>1940</th>
<th>1950</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>47,683</td>
<td>35,555</td>
</tr>
<tr>
<td>1 - 4</td>
<td>153,045</td>
<td>151,225</td>
</tr>
<tr>
<td>5 - 6</td>
<td>95,083</td>
<td>102,065</td>
</tr>
<tr>
<td>7 - 8</td>
<td>62,584</td>
<td>82,395</td>
</tr>
<tr>
<td>9 - 11</td>
<td>27,889</td>
<td>47,525</td>
</tr>
<tr>
<td>12</td>
<td>10,730</td>
<td>16,010</td>
</tr>
<tr>
<td>Fr.-Jr.</td>
<td>6,767</td>
<td>9,480</td>
</tr>
<tr>
<td>Grad.</td>
<td>6,425</td>
<td>12,435</td>
</tr>
<tr>
<td>No Data</td>
<td>9,731</td>
<td>9,645</td>
</tr>
<tr>
<td>Total</td>
<td>419,937</td>
<td>466,335</td>
</tr>
</tbody>
</table>

These facts reveal the educational mortality rate among Negro
children and why so many are not qualified to enter skilled em-
ployments. Many are destined to become unskilled laborers and
this accounts in part for their low economic status. The schools
should therefore be strengthened to benefit the pupils of school age.

**Elementary Schools.** The following subjects are included at this level: language, spelling, writing, arithmetic, social studies, health, physical education, art, music, and science. The existing curriculum is implemented by the provision of free textbooks. Library books, supplementary readers, maps and globes, art and construction supplies, music appreciation materials and other instructional aids are also used.

1. **Number of Schools.** There were 1,387 public elementary schools for Negroes in 1949-50. Two hundred eighty-four of these were one teacher schools, 621 were 2-3 teacher schools, 225 were 4-6 teacher schools, 83 were 10-14 teacher schools, and 76 had 15 or more teachers.

2. **Length of School Term.** The average was 178 days in 1944-45.

3. **Instructional Personnel.** There were 6,125 Negro elementary school teachers in 1949-50 and 173 principals, and their average annual salary was $2,640.19.

4. **Enrollment and Attendance.** There were 182,691 pupils in 1949-50. The first grade enrolled 42,129, the second grade 31,594, the third grade 29,652, the fourth grade 28,824, the fifth grade 26,596, and the sixth grade 23,896. There were 32 pupils per teacher. The expenditure per pupil was $177.10, in contrast to the national average of $197.65.

**High Schools.** One problem in improving the educational opportunities is the small size of most of the high schools where the
curriculum offerings are limited to five academic fields: English, mathematics, social studies, science, and foreign languages. High schools of three teachers attempt to offer four units in each subject, except for foreign language in which two units are offered.

Only one half of the persons who enter high school graduate four years later. The holding power of the larger high schools is greater than that of the smaller ones. This is due to more diversified curriculum offerings in the larger high schools. The Biennial Report for 1949-50 reveals (p. 39) the number of teachers per school in 1949-50.

Table X

NUMBER OF TEACHERS IN NEGRO HIGH SCHOOLS
State Department of Public Instruction

<table>
<thead>
<tr>
<th>Teachers</th>
<th>County</th>
<th>City</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>22</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>29</td>
<td>7</td>
<td>36</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>9</td>
<td>44</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>7 - 11</td>
<td>43</td>
<td>13</td>
<td>56</td>
</tr>
<tr>
<td>12 - 16</td>
<td>4</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Over 16</td>
<td>2</td>
<td>11</td>
<td>13</td>
</tr>
</tbody>
</table>

Agriculture and homemaking courses have been introduced in the rural schools and there has been some growth in recent years in trade, industrial, and distributive education. The curriculum is chiefly for the small group which will go to college and accounts in
part for the withdrawal of pupils for whom the program is unsuited.

High schools with six or more teachers can vary their offerings to suit the needs and abilities of a maximum number of students. The number of high schools with six or more teachers is increasing from year to year. There were 114 of these in 1949-50. However, the number of small high schools is still one of the greatest handicaps to the development of a satisfactory program of education because only 15 percent offer courses other than the five subjects mentioned, 11 percent in industrial arts, 6 percent in vocational shop work, 5 percent in diversified occupations, and only 2 percent in distributive education.

The education of teachers in 1949-50 ranged from one case with only three years of high school, to 691 cases with five or more years of college. Five had completed four years of high school, 35 one year of college, 100 three years of college, and 7,014 four years of college. A total of 7,941 Negro teachers were employed in the public schools during the school year of 1949-50.

The salaries of high school teachers averaged $2,570 in 1949-50 for a nine month school year, principals averaged $4,234.90 for a ten month school year, and the salaries of vocational teachers averaged $3,406.90.

The average daily attendance for 1949-50 was 36,556. There were 23 pupils in average daily attendance per teacher employed. Table XI shows the number of students taking work in the practical arts and vocational subjects.
Table XI
SUBJECT ELECTIONS IN NEGRO HIGH SCHOOLS
State Department of Public Instruction

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Schools</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture I</td>
<td>102</td>
<td>2,684</td>
</tr>
<tr>
<td>Agriculture II</td>
<td>101</td>
<td>1,873</td>
</tr>
<tr>
<td>Agriculture III &amp; IV</td>
<td>85</td>
<td>1,402</td>
</tr>
<tr>
<td>Home Economics I</td>
<td>171</td>
<td>7,316</td>
</tr>
<tr>
<td>Home Economics II</td>
<td>169</td>
<td>5,094</td>
</tr>
<tr>
<td>Home Economics III &amp; IV</td>
<td>123</td>
<td>3,092</td>
</tr>
<tr>
<td>General Business</td>
<td>31</td>
<td>997</td>
</tr>
<tr>
<td>Typing I</td>
<td>68</td>
<td>2,095</td>
</tr>
<tr>
<td>Typing II</td>
<td>39</td>
<td>856</td>
</tr>
<tr>
<td>Business Arithmetic</td>
<td>23</td>
<td>640</td>
</tr>
<tr>
<td>Bookkeeping I</td>
<td>8</td>
<td>263</td>
</tr>
<tr>
<td>Bookkeeping II</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Shorthand I</td>
<td>21</td>
<td>372</td>
</tr>
<tr>
<td>Shorthand II</td>
<td>9</td>
<td>151</td>
</tr>
<tr>
<td>Business English</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Business Law</td>
<td>4</td>
<td>126</td>
</tr>
<tr>
<td>Business Geography</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Office Practice</td>
<td>3</td>
<td>52</td>
</tr>
<tr>
<td>Industrial Arts</td>
<td>28</td>
<td>1,531</td>
</tr>
<tr>
<td>Electricity</td>
<td>16</td>
<td>569</td>
</tr>
<tr>
<td>Diversified Occupations</td>
<td>15</td>
<td>430</td>
</tr>
<tr>
<td>Brick Masonry</td>
<td>13</td>
<td>332</td>
</tr>
<tr>
<td>Auto Mechanics</td>
<td>6</td>
<td>139</td>
</tr>
<tr>
<td>Carpentry</td>
<td>4</td>
<td>114</td>
</tr>
<tr>
<td>Building Trades</td>
<td>2</td>
<td>79</td>
</tr>
<tr>
<td>Woodwork</td>
<td>3</td>
<td>81</td>
</tr>
<tr>
<td>Sheet Metal</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>Machine Shop</td>
<td>2</td>
<td>82</td>
</tr>
<tr>
<td>Shoe Repairing</td>
<td>1</td>
<td>59</td>
</tr>
<tr>
<td>Plumbing</td>
<td>1</td>
<td>12</td>
</tr>
</tbody>
</table>

These data reveal that the offerings are primarily in Agriculture and Home Economics, beyond the basic requirements of English, social
studies, mathematics, and science. This is due in part to the rural situation. Eight industrial arts programs have been added since 1950 so there were 36 active programs in 1955.

The Biennial Report of the Superintendent of Public Instruction for 1949-50 reveals (p. 39) the number of students enrolled by grades 9 through 12 in 1949-50, as shown in Table XII.

Table XII

<table>
<thead>
<tr>
<th>NEGRO ENROLLMENTS By Grades 1949-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Ninth</td>
</tr>
<tr>
<td>Tenth</td>
</tr>
<tr>
<td>Eleventh</td>
</tr>
<tr>
<td>Twelfth</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Approximately 36,000 of the students enrolled in the high schools will become job seekers on the labor market before completing high school, or after graduation. More than 27,000 of these will not have had an opportunity to explore their occupational potentials, due to the restricted curriculum offerings of their schools. They will enter the labor market on a trial and error basis with little insight or understanding of occupations. Thus, the school programs are actually fostering unskilled labor.

Colleges. North Carolina leads the southern states in the number of four-year colleges for Negroes, with eleven. These have
received "A" ratings by the Southern Association of Secondary Schools and Colleges. Five are state supported. The Agricultural and Technical College in Greensboro offers training in Agriculture, Trade and Industrial Education, Engineering, Education and Science. It offers the master's degree in Rural Education, Agricultural Education, and Industrial Arts Education. The North Carolina College at Durham offers training in the Liberal Arts through the doctorate. The Teachers Colleges at Elizabeth City, Fayetteville, and Winston-Salem are coeducational.

Six schools are sponsored and supported by religious groups. Bennett (Methodist) and Barber-Scotia (Presbyterian) Colleges for Women are located respectively at Greensboro and Concord. The remaining four sectarian colleges are coeducational: Johnson C. Smith (Presbyterian) at Charlotte, Livingstone College (African Methodist Episcopal) at Salisbury, and Saint Augustine (Protestant Episcopal) and Shaw University (Baptist) at Raleigh.

EMPLOYMENT

More than 50 percent of the Negro workers are farmers. Farming, being seasonal, works against the achievement of a balanced economy and provokes a desire to move into the urban areas where year round employment is available. The State Education Commission pointed out in 1948 that most farm youth are desirous of moving into urban areas. Table XIII shows the labor force for 1940 and 1950.
Table XIII
THE NEGRO LABOR FORCE IN 1940 AND 1950
U. S. Bureau of the Census

<table>
<thead>
<tr>
<th>Categories</th>
<th>1940</th>
<th>%Emp.</th>
<th>1950</th>
<th>%Emp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Males</td>
<td>491,228</td>
<td>53</td>
<td>527,265</td>
<td>30</td>
</tr>
<tr>
<td>All Females</td>
<td>512,760</td>
<td>24</td>
<td>551,543</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>1,003,988</td>
<td>38</td>
<td>1,078,808</td>
<td>36</td>
</tr>
<tr>
<td>Males over 14</td>
<td>326,284</td>
<td>80</td>
<td>336,377</td>
<td>79</td>
</tr>
<tr>
<td>Females over 14</td>
<td>345,576</td>
<td>36</td>
<td>361,231</td>
<td>35</td>
</tr>
<tr>
<td>Total over 14</td>
<td>671,862</td>
<td>57</td>
<td>697,608</td>
<td>56</td>
</tr>
</tbody>
</table>

There has been little change in the labor force for men and women in the past decade. While 56 percent of the force was employed in 1950 as compared with 57 percent in 1940, a very significant fact is that the unemployed had decreased noticeably from 12 to 5 percent by 1950. This may have been due to the war and to the emergency training programs.

Table XIV shows employment categories of industrial workers for 1950. The Negro is employed predominantly in agriculture and manufacturing. There is a fair distribution between construction, transportation and communication, wholesale and retail trade, personal services, and professional services. There are fewer employed in public administration, insurance and real estate, and business and repair services.
Table XIV

EMPLOYMENT CATEGORIES OF NEGROES OVER 14 BY SEX IN 1950
U. S. Bureau of the Census

<table>
<thead>
<tr>
<th>Category</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Forestry, Fishing</td>
<td>105,528</td>
<td>19,860</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>51,878</td>
<td>6,848</td>
</tr>
<tr>
<td>Trade</td>
<td>20,535</td>
<td>7,459</td>
</tr>
<tr>
<td>Construction</td>
<td>17,902</td>
<td>211</td>
</tr>
<tr>
<td>Personal Services</td>
<td>12,912</td>
<td>122</td>
</tr>
<tr>
<td>Transportation, Communication</td>
<td>11,989</td>
<td>381</td>
</tr>
<tr>
<td>and Public Utilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional Services</td>
<td>9,918</td>
<td>14,072</td>
</tr>
<tr>
<td>Business and Repair</td>
<td>3,113</td>
<td>88</td>
</tr>
<tr>
<td>Public Administration</td>
<td>3,074</td>
<td>483</td>
</tr>
<tr>
<td>Entertainment and Recreation</td>
<td>1,849</td>
<td>381</td>
</tr>
<tr>
<td>Insurance and Real Estate</td>
<td>1,635</td>
<td>787</td>
</tr>
<tr>
<td>Mining</td>
<td>553</td>
<td>6</td>
</tr>
</tbody>
</table>

Table XV shows the number of workers classified by sex in 1950. The greatest number of workers are farmers or laborers. The professional workers are largely public school teachers where over 50 percent are women.
Table XV
NEGROES CLASSIFIED BY OCCUPATION AND SEX IN 1950
U. S. Bureau of the Census

<table>
<thead>
<tr>
<th>Occupations</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>61,784</td>
<td>2,254</td>
</tr>
<tr>
<td>Laborers</td>
<td>45,788</td>
<td>1,449</td>
</tr>
<tr>
<td>Operatives</td>
<td>43,120</td>
<td>15,535</td>
</tr>
<tr>
<td>Farm Laborers and Foremen</td>
<td>42,470</td>
<td>17,500</td>
</tr>
<tr>
<td>Service</td>
<td>19,451</td>
<td>15,794</td>
</tr>
<tr>
<td>Craftsmen, Foremen</td>
<td>15,061</td>
<td>315</td>
</tr>
<tr>
<td>Professional, Technical</td>
<td>4,634</td>
<td>8,221</td>
</tr>
<tr>
<td>Managers and Proprietors</td>
<td>3,007</td>
<td>1,009</td>
</tr>
<tr>
<td>Household</td>
<td>2,010</td>
<td>43,031</td>
</tr>
<tr>
<td>Clerical</td>
<td>1,959</td>
<td>1,378</td>
</tr>
</tbody>
</table>

The income for 1949 is presented in Table XVI.

Table XVI
RURAL AND URBAN INCOMES OF THOSE OVER 14
U. S. Bureau of the Census

<table>
<thead>
<tr>
<th>Source</th>
<th>Male</th>
<th>Female</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>$678.00</td>
<td>$309.00</td>
<td>$478.00</td>
</tr>
<tr>
<td>Urban</td>
<td>1,220.00</td>
<td>474.00</td>
<td>827.00</td>
</tr>
<tr>
<td>Total</td>
<td>1,002.00</td>
<td>423.00</td>
<td>714.00</td>
</tr>
</tbody>
</table>
Urban incomes were almost double rural incomes in 1949. The income of men doubled that of women in the two classifications. Even so, the average income of Negroes was $714.00 or $579.00 less than the State average of $1,293.00. This emphasizes the need for mechanization of farming, for diversification of agricultural products, and for technical skills at all levels. Broader and richer education through larger schools with greater diversity of curriculum offerings are therefore needed. Programs are required that will also provide background for youth interested in setting up their own establishments.

There is need for providing educational facilities that will enable these youth to explore and develop occupational skills. There is also need for the consolidation or redistricting of smaller schools, in order to provide broader curricula, that will satisfy the needs of students who will live and work in areas that are increasingly industrial.

The employment status of Negro youth falls currently and predominantly into the general category of unskilled laborer. The potential of this group for the North Carolina labor market needs therefore to be cultivated. The manufacturing, construction, communications, and power and transportation industries in North Carolina are expanding their facilities, hence the need for broad training in industrial areas that are representative of the State.

Shorter working hours would bring about need for worthwhile use of leisure time during non-working hours. Industrial arts could
develop the interests of these individuals through hobbies, thus playing a vital role in the growth of well rounded and respectable citizens. The general educational and economic level of the State would thereby be raised.
Chapter V

NATURE OF INDUSTRIAL ARTS

Many persons refer to industrial arts narrowly as "manual training" or "manual arts." America's tremendous industrial development is of great significance in the present complex social order. Every possible effort should be made to interpret this highly industrialized order to boys and girls. There is a need therefore for individuals to develop a broad social philosophy in order to live the best possible life in a changing social order. Data in this study show that man's values must necessarily change with the changing educational, occupational, and economic status. This point of view is brought into focus by a discussion found in Science in General Education Report, page 33.

Ideals and patterns of belief and action evolve from the will of the people; consequently they are always in process of reconstruction and reinterpretation as the needs and conditions of the people change.

In this chapter the discussion will deal with industrial arts as it relates to: (1) origins, (2) programs, (3) curricula, and (4) organization.

ORIGINS

Biological. Physical activity has provided an important means of learning and growth from earliest childhood. Acting, throwing the arms, and other general muscular movements of early
infancy, constituting learning through doing, are the most characteristic activities of the child's neuromuscular system. Such general activities are vital to his development.

As the nervous system matures, activity becomes more specific and purposeful. At first it is activity for activity's sake. The baby tosses about, cries, and takes nourishment. Later he runs across the room, with frequent stops, and turns for adult approval. A child picks up an article, pulls it apart, or perhaps throws it, regardless of what it is or where he is.

Bonser (6) lists four types of impulses which find satisfaction in the several phases of the study of industrial arts:

1. The impulse to manipulative activity, resulting in the handling of materials and tools, and in time, the using of those in constructive and investigative activities.

2. The impulse to investigate, expressing itself in inquiries about constructive methods, kinds of sources of materials, uses of materials and products, the operation and explanation of devices and principles of machines and construction, and the relationship of practical activities to human purposes.

3. The art of aesthetic impulse, which finds satisfaction in the enjoyment of beauty in form as observed in materials and products, and in creative production by the designing and constructing of new products.

4. The social impulse, leading one to observe what others are doing, to attempt to share with others their activities, and to secure from others their approval and cooperation in furthering one's own activities.

The impulse to activity cannot be inhibited without warping growth, but it should be met by materials, incentives, and guidance. Action so controlled results in establishing nervous and muscular
coordination essential to proper development. Such a pattern of rational growth continues into adulthood. In childhood, the individual begins to assemble objects and to evidence satisfaction when building things out of blocks, or other playthings. By the time he has reached adolescence, his muscular and nervous coordination are developed to the point where he can acquire specific physical and mental skills without undue strain.

The span of attention which in childhood is very short gradually lengthens, paralleling physical growth, and accompanying the transition from general to more specific types of behavior.

The individual's tendency to manipulate together with his curiosity concerning what things are and how they operate, provide a strong motive for learning. There is a natural tendency on the part of every individual through life to manipulate and investigate material things which concern or interest him and to do things in certain ways or patterns. Industrial arts as well as the other practical arts, provides a means for self-expression.

The individual, according to Warner (34), whether in an urban or rural environment, is frequently handicapped by inaccessibility to the thing he hears about and wants to experience. It is perfectly natural for a normal child to attempt to satisfy such wants by some means or other. For example, one group of boys may assemble equipment for making a printer's outfit in the basement of a youngster's home. Another group may build a completely equipped model home,
fully lighted with electricity, walls papered, roof shingled, outside painted, and inside furnished. This points with great emphasis to the need for supplying facilities and materials for doing things which children want and need to do, but which should be carried on in educational situations under intelligent social sponsorship.

With increasing maturity and the development of more complex patterns of construction, an ever wider variety of materials and techniques is required, which if supplied under stimulating influences, leads to the development of a scientific attitude of inquiry. The nature of industrial arts makes a universal appeal, not limited by age, sex, race, intelligence, or aptitude; nor are the values in this phase of education limited to persons pursuing certain occupational interests, for there is no occupational interest which cannot be served through the broadening influence of industrial arts experiences. No matter what the occupation, it invariably touches on many material, social and economic factors. Wholesome balance in these respects may be developed in young people through home work experiences. This is recognized by the industrialist and businessman, as well as the parent.

The periods of development, namely childhood, adolescence, and adulthood, which closely parallel the elementary school, the secondary school, and the colleges, or later programs, respectively, have their special characteristics which find counterparts in varying phases of industrial arts work. Activities such as those which
industrial arts present, provide opportunities for self-expression in natural media as opposed to instruction in abstractions. Industrial arts activities provide excellent educational experiences for preserving and developing the artistic and natural side of a child's nature.

Orientation as regards occupational life should usually be provided more prominently in early adolescence than in earlier or later years. The need, however, varies with individuals and with conditions. Once a good introduction has been made to materials and processes, there is an opportunity in later adolescence for realizing values peculiar to industrial arts. An individual's interest in interior decoration, arts, pottery, fine printing, landscape architecture, or invention, suggests what may be included in an industrial arts program. The implications for occupational specialization become at once apparent. More important, however, is the opportunity for exploratory experiences that have value for determining in what broad fields of human activities the individual's interest lie. As society becomes more complex he will need industrial arts and general work experiences to participate successfully in the varied occupational life around him. Such experiences should be supplied at the elementary, secondary, and higher school levels. Learning through interaction with environment is fundamental to this "origin."
Economic. Society according to Warner (34) in early New England experienced economic and living conditions little different from those of an Italian community in the time of the Roman Empire. Both communities used hand tools and practiced the household industries. Power driven machinery was unknown. The only means of transportation was by animal power, oxen or horses. Transportation costs were such that trade was mainly local.

A growing social integration with correlative increase in interdependence is one of the most obvious effects of modern growing industrialization. Before the days of machinery, each village was, in a great measure, self-contained. Food, clothing, and shelter, all simple enough to be sure, were generally obtained within the immediate region. In such an order the family was the chief industrial agency, supplemented in the cities by the guild. But power machinery has wrought fundamental changes. For example, with the coming of the spinning jenny and the power loom, the family shop gave way to the factory. With the cotton gin and increasing means of transportation, cotton raised in America was shipped away to be woven, and again to be made into garments which were distributed for sale into thousands of communities. Raw materials brought from far and near were manufactured into marketable products, and then shipped to all quarters of the globe, thus creating mutual interdependence. This is also true in the growing division of labor, where each person is
increasingly dependent on others. Growing interdependence and integration are thus correlative aspects of the same social process.

Communications, the intellectual side of the same integration has increased in even greater measure, particularly in the matter of ease and rapidity of spread of ideas. Since Napoleon's day four means of transportation serve to facilitate greatly the transportation of written and printed matter, the steamship, the railroad, the automobile, and the airplane; while four others all but annihilate the time of transmission of words,—the telegraph, the cable, the telephone, and the wireless.

What is the cause of the change in our ways of living? So far as the last hundred years is concerned the answer seems clear. The principal cause is the great number of inventions that the world has seen within the latter half of that period. All the major applications of electricity have found their way into practical use. The internal combustion engine was devised, thus making possible the automobile and the flying machine. Whenever change looms as large as now, one must seek adjustment to change itself.

Power potentials have increased to such an extent within the last century that contemporary civilization is startled at the phenomena. These technological developments of natural sources of power such as water, sun, and the wind result in the production of electricity and heat. Research in petroleum products has been even more economically efficient by the production energy per unit of fuel.
Dewhurst (12) presents a pictoramic table (XVII) showing the development of power potentials in the past century.

Table XVII

ECONOMIC BASIS AND TENDENCY

Energy Output from Mineral Fuels and Water
Power Compared with Work Animals and Humans
Dewhurst, America's Needs and Resources

<table>
<thead>
<tr>
<th>Year</th>
<th>% Animal Energy</th>
<th>% Human Energy</th>
<th>% Tech. Energy</th>
<th>Billions H.P.Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1850</td>
<td>78.8</td>
<td>15.4</td>
<td>5.8</td>
<td>1.0</td>
</tr>
<tr>
<td>1880</td>
<td>68.6</td>
<td>14.2</td>
<td>17.2</td>
<td>6.8</td>
</tr>
<tr>
<td>1900</td>
<td>51.7</td>
<td>10.5</td>
<td>37.5</td>
<td>31.3</td>
</tr>
<tr>
<td>1910</td>
<td>34.7</td>
<td>8.4</td>
<td>56.9</td>
<td>74.8</td>
</tr>
<tr>
<td>1920</td>
<td>20.8</td>
<td>5.7</td>
<td>73.5</td>
<td>145.0</td>
</tr>
<tr>
<td>1930</td>
<td>11.7</td>
<td>4.6</td>
<td>83.7</td>
<td>199.5</td>
</tr>
<tr>
<td>1940</td>
<td>6.4</td>
<td>3.6</td>
<td>90.0</td>
<td>260.4</td>
</tr>
<tr>
<td>1950</td>
<td>3.0</td>
<td>3.0</td>
<td>94.0</td>
<td>386.2</td>
</tr>
<tr>
<td>1960</td>
<td>1.3</td>
<td>2.4</td>
<td>96.3</td>
<td>471.6</td>
</tr>
</tbody>
</table>

The complexities of modern business and industry account for many of the maladjustments that now agitate society. The elements and principles of social and economic life are the same today, as then, but the relationship existing between them has become obscured by their complexity. Points such as these indicate a phase
of life which industrial arts and its related social and physical sciences need to interpret. Experience provided through industrial arts is important for a sound understanding, on the part of the pupil, of the social-economic forces and conditions operating in society.

Industrial Arts, Its Interpretation in American Schools. The school of today needs to interpret the ever increasing number of significant changes which press for consideration on every hand. The school shop, for example, can no longer justify its program if youngsters only make traditional objects of wood and then take them home as they did generations ago. Functions of the modern program require a much more significant contribution. Such programs now provide for:

1. Activities in many industries.
2. Use of typical industrial tools.
3. Experience in production methods.
4. Acquaintance with the organization and operation of industrial and commercial enterprises.
5. Experience in handicrafts.
6. Study of safe and hygienic ways of doing work.
7. Practice in identifying important methods in industry.
8. Selection and use of the common products of industry.
9. Utilization of salvaged materials for project work.
10. Study of the origins and effects of significant inventions.
11. Interpretation of the sources, principles, and applications of power, such as steam, water, internal combustion, and electricity.

12. Study of materials from source to completed project.

13. Study of vocational opportunities, living conditions, remuneration of workers, controversial questions pertaining to capital, labor, and technology.

It is important to recognize that the industrial arts program of today concerns itself with and draws its subject matter from such sources. A study of the social-economic character of the present day is necessary to help the pupil acquire certain abilities, knowledges, appreciations, and attitudes that have become vital to modern life.

An industrial society is characterized by change, not only technological and occupational, but social. The problem is so great that even in an ideal situation the industrial arts laboratory can serve only as a center from which to direct many valuable field studies and experiences throughout all levels of the school program.

Political. Man has been in a state of "flux throughout civilization as to the relationship that should exist between capital and labor and the control of these economic forces of society." The controversy between democracy and communism is not a novel idea of contemporary society but can be reflected in the ideals of leaders decades ago.
Thomas Jefferson in a letter written to Monroe in 1870, said, "If we are made in some degree for ourselves, it were contrary to the feeling and ridiculous to suppose that a man had less rights in himself than one of his neighbors, or indeed all of them put together. This would be slavery, and not that liberty which the Bill of Rights has made inviolable, and for the preservation of which our government has been changed. Nothing can be so completely divest of that liberty as the establishment of the opinion that the state has a right to the services of all its members."

The Declaration of Independence,- "We hold those truths to be self-evident, that all men are created equal, that they are endowed with certain unalienable rights, that among these are life, liberty, and the pursuit of happiness." This is well amplified on page 37 of, Science in General Education, as follows:

   It should be clearly understood that social action is not a collectivism that crushes the individual, that elevates the welfare state above that of the individual, or denies to the individual his opportunity for free expression and the exercise of his initiative.

   It is, on the other hand, the only means under modern conditions through which the freedom, initiative, and rights of the individual can be guaranteed and maintained . . . The committee holds, . . . that the idea of maximum development of the individual should still be cherished as a goal, and that the schools should help to interpret its meanings in the light of rapidly changing social, economic, and political conditions.
The doctrines of men lend themselves to open minded discussion in the political nature of modern highly industrialized society. The basic rise of civilizations is couched in the concepts and principles of civilization. America's rise to the pinnacle of modern civilization is revealing and fascinating. The slave labor movement, indentured servitude, apprenticeship training, master craftsmen, strikes, monopolies, labor versus management, arbitration, mass production, decentralization of industries, children and women labor laws, labor unions, management associations, "America, the industrial giant," all blend into common dictum for industrial literacy. These postulates serve as profound symbols of modern industrial relations heritage and stimulate one toward a richer and deeper appreciation and understanding of his American background and a world wide perspective. This is to be desired.

In the Congressional Record, proceedings and debates of the 83rd Congress, Volume 100, Part 1, January 6, 1954 to February 5, 1954, page 78, January 7, 1954. President Eisenhower in his State of the Union Address states that, "American freedom is threatened so long as the world communist conspiracy exists in its present scope, power and hostility. More closely than ever before, American freedom is interlocked with the freedom of other people. In the unity of the free world, lies our best chance to reduce the communist threat without war. In the task of maintaining this unity and strengthening
all its parts, the greatest responsibility falls to those who, like ourselves, retain the most freedom and strength. We shall, therefore, continue to advance the cause of freedom on foreign fronts."

January 8, 1954, p. 82. "No government can inoculate its people against the fatal materialism that plagues our age. Happily, our people, though blessed with more material goods than any people in history, have always reserved their first allegiance to the kingdom of the spirit, which is the true source of that freedom we value above all material things. But a government can try, as ours tries, to sense the deepest aspirations of the people, and to express them in political action at home and abroad. So long as action and inspiration humbly and earnestly seek favor in the sight of the Almighty, there is no end to America's forward road; there is no end obstacle on it. She will not surmount in her march toward a lasting peace in a full and prosperous world."

As man advances in a complex technology, he should be provided with experiences that will enable him to enjoy a richer and finer culture as regards materials than was possible in any previous history. This can be brought about only if he is broadly prepared to develop and to use his material inheritance.

Warner, in the Interpretation bulletin (48, p. 7), has this to say concerning material culture:

The individual who has learned to know style or design is prepared to make selections that an integrated
or cultured taste tells him can supply lifelong satisfactions. One who knows the various forces, racial, individual, symbolic, material and national that have entered into the making of articles of every-day use, is thereby stimulated to a fuller enjoyment of those things than the person without such knowledge.

Industrial arts is concerned chiefly with aiding in creating within the individual a desire for a higher standard of living. Bonser, Warner and others, use the expression "consumer literacy" to indicate intelligence necessary for efficiency in the selection, care and use of industrial products and services. Once modern industrial society is provided with a great variety of material things such as metal, plastics, woods, ceramic, textiles, and foods. Education in industrial arts for everyone will make a more significant contribution to this much neglected phase of education.

One of the first ideas, along with the origin of the junior high school in the second decade of the twentieth century, was to provide for broad orientation. Industrial arts began to call for diversity rather than specialization of skills. Many materials were used along with experiences in the basic techniques employed by industry. Bonser's early definition, "Industrial arts is a study of the changes made by man in the forms of materials to increase their values, and of the problems of life related to these changes," was but a modern interpretation of the aims of general education.

The industrial arts movement is in the midst of a transition that reflects modern industrial development. Laboratories of industry are designed for flexibility and a more functional approach to
the study of modern American industry. Experimentation and research are receiving pronounced attention. Girls are encouraged to pursue industrial arts courses, methods of industry are reflected in personnel organization and the use of audio-visual materials and instruction sheets.

PROGRAMS

1. Conventional Secondary
   a. General. Industrial arts on the junior high school level is largely orientational. Characteristics of adolescents provide the teacher of industrial arts with a rare privilege. The pupil's attention is drawn in many directions by a world of challenging problems in the field of industrial development. Thinking, planning, and painstaking effort help the student to develop an appreciation of refinement in workmanship. During early adolescence it is particularly important that boys and girls have their horizon greatly enlarged. Teachers of industrial arts have the responsibility of helping their pupils develop an intelligent understanding of the age in which they live. This may be done through assigned study, class discussion, visits to industrial plants, laboratory experimentation and investigation, and through other desirable forms of industrial arts activity.
b. **Technical.** Student interests begin to crystallize into desires that are more definitely vocational as the pupil advances to higher educational levels. Industrial arts laboratories in the senior high school must answer to practical values related to occupational life. Some industrial arts activities will be a continuation, on a more advanced level, of those found in the junior high school. Others will represent new activities or activities involving more complex projects because of the more mature interests and abilities which they demand. It would be difficult to conceive of any program of secondary education which did not attempt to give vocational direction to the pupils who come under its influence. Industrial arts subjects as a part of the general education program of any high school may lead into definite vocational studies. Industry is making new and exacting demands on those who enter its ranks. Industrial arts, because of its diversified program of laboratory experiences, fortified by other high school subjects meets the demands of modern industry.

2. **Atypical.** Industrial arts subjects may serve as forms of rehabilitation or have a therapeutic value.

   a. **Blind.** Many industries in contemporary society realize the importance and employability of individuals handicapped by blindness. Industrial arts activities in clay and weaving are especially adaptable to these individuals. These experiences
may prove to be creative hobbies, or lead to vocational pursuits.

b. Deaf. Individuals with defective hearing may be provided with industrial arts experiences. Activities such as assembling, forming, and shaping may be provided in all subjects.

c. Behavior. The industrial arts program is adapted to the needs of many maladjusted students. It can provide opportunities for them to discover their potentialities as well as their interests. Those experiences which contribute most to the development of the possibilities in each individual will be selected. Some will profit most by academic experiences, others by the acquisition of tool skills. The great majority will probably be served best by a generous sampling of all fields.

3. Recreational. The encouragement and promotion of wholesome recreational interests is an important part of the work of the school in developing citizenship. The industrial arts laboratory serves in the stimulation and development of many interests in the field of handicraft. Students frequently face the problem of how to use their free time. Many are not conscious of their abilities until they have been led to see the possibilities for growth and development in new fields. A few simple hand tools can serve as a basis for providing worthwhile leisure time activities in the home. Many of the materials of industry such as plastics, wood, textiles, and
metal can be employed as worthwhile experiences. Small power tools may be added gradually. Many persons have been known to exploit these experiences and develop them into paying enterprises.

School clubs are now commonly organized for both girls and boys. Clubs are a means of extending and supplementing the exploratory curriculum. This is apparent when clubs are organized to deal with typical child interests, such as model airplane construction, arts and crafts, archery, boatbuilding, printing, stage craft, photography, radio, television, and novelty work. In schools where there is a rich offering of constructive activities in well appointed laboratories, clubs are likely to grow out of the laboratory experience. Individual pupils develop special interests which means further study and experience. As school clubs generally admit pupils from various grade levels, membership should be restricted to pupils with advanced interest in the activities represented by the club.

CURRICULA

Orientational. Among industrial arts activities that may be organized for instruction in accordance with the interests and abilities of junior high school pupils are:

1. Electricity, with special reference to its use in the home.
2. Wood work and wood finishing, with special reference to the use and care of wood products in the home.
3. Elementary work in clay, including projects in pottery.
4. Construction work that involves the use of stains, paints and lacquers.

5. Textiles, including the study of textile products and manipulative work in their construction.

6. Art metal, emphasizing the making of articles of simple construction and design.

7. Photography, including the taking of pictures of simple composition and their development.

8. Printing, including the project of a small paper.

**Technological.** "Laboratory of industries" have been promoted in certain educational centers where extensive research has been done in industrial arts organization. The units are selected from broad areas of human endeavor in the whole field of industrial work. Here the approach is made by introducing the pupil to areas of construction, manufacture, power and transportation and construction.

**Methods and Devices.** The use of power machines has a definite value in interpreting the present industrial civilization to adolescent boys and girls. Through assigned study, class discussion, visits to industrial plants, laboratory experimentation and investigation, lecture demonstration, the industrial arts teachers may find ways for sharing in the communication of ideas. The pupil personnel system, instruction sheets and working plans, text and reference books and magazines, moving pictures, slides, tests, progress charts, records, posters, and chart catalogs of tools, bulletin boards,
photographs, files of industrial information, permanent and temporary exhibits, school and other libraries, museums, pupils notebooks, equipment and materials, are devices that may be employed by the teacher of industrial arts.

ORGANIZATION

The Physical Setting. Warner (53) states that, "A laboratory shall be thought of not only as a place for making projects, but equally as a place for planning, investigating, testing, experimenting, consulting, evaluating, . . . In short, the laboratory shall be thought of as a place for thinking as well as feeling and doing."

His list of principles include:

1. Areas Represented. Any basic industrial process or material adaptable to pupil use shall be considered as suitable and desirable basis for an activity in an Industrial Arts Laboratory. Study, investigation, testing, and demonstration should be carried on so as to represent a still greater variety of industries.

2. The Reference Material, or library shall be considered as much a part of the laboratory as any tool, machine, or area, and should be provided for and utilized in much the same manner.

3. The Instructor should have some designated area which includes a desk, typewriter, filing cabinets, preferably located away from noise and dirt, but convenient to the reference and planning center and commanding as full a view of the laboratory as possible.

4. An Assembly Area should be provided as a service to all other centers in the laboratory. This area may well be in common with the space reserved in front of large outside openings where cars and trucks may be driven into the laboratory as needs arise.
5. **Local Limitations** such as insufficient space or funds should be met by reducing the number of accommodations in several or all areas rather than by eliminating a complete area.

6. **Nature of Equipment.** The maturity of the pupils who are to use the laboratory should be a guiding factor in the planning of equipment, particularly as regards size, weight, power, capacity, and safety of machine and hand tools.

7. **Safety Factors** shall be given first consideration in all laboratory planning. They become paramount in the placing of equipment. Any area shall be visible from every portion of the laboratory. Such points also include: the location of aisles of travel, and such items as light, color, and acoustical treatment. Machines around which exist zones of danger such as: jointer, bandsaw, hacksaw, lathe, etc., should be so placed as to reduce, or better eliminate the possibility of pupils being in line of danger. Such zones should be indicated on the floor by painted lines.

Handling of hot metal in founding, forging, welding, etc., and the operation of hazardous machines such as the circular saw, jointer, lathes, bandsaw, shaper, printing press, paper cutter, etc., shall be isolated from all traffic and distracting interference as far as possible.

8. **Interference.** Pupil work stations shall be so placed that interference from adjacent workers and aisle travel will be reduced to a minimum.

9. **Flexibility** to meet the challenge of changing programs and pupil needs should be provided for in any laboratory plan and installation. This implies that unassigned floor areas may occur, that large equipment should never be so integral with the building that it cannot be shifted, that individual drives on all machines become a necessity, that an abundance of well-distributed service outlets should be provided, in keeping with the desirability of semiportable equipment. Expansion and alterations should be anticipated as a means of meeting further demands on floor space by new equipment or areas, larger enrollments, character of the program, etc.
10. **Laboratory Size and Shape.** Size of laboratory shall be determined by the general rule of allowing a minimum floor area of 75 square feet per pupil. This figure includes storage space, tool room, finishing room, dark room, planning room, etc., and is useful for laboratories planned to accommodate twenty-five pupils or more. Due to the necessity of certain fixed items regardless of pupil capacity, the figure of 75 square feet per pupil must be increased proportionally as the classes reduce in size. Laboratories designed for operation by a single teacher should approximate 3,000 square feet in floor space.

The shape of a laboratory is most important. It should in general be rectangular and have a proportion of 1 to 1½ or 1 to 2. The width should never be less than 30 feet; preferably more. Irregularly shaped laboratories such as the "U", "L", etc., should be avoided as quite unsuited to school needs.

A pupil station is defined as any location in the laboratory where a pupil may be engaged, such as at a bench, a vise, in the tools center, at a reading table. Between 50 and 100 percent more stations should be provided than the maximum number of pupils using the laboratory at any one time.

11. **Laboratory Arrangement.** Distinct aisles of travel shall be provided between all areas and points of common usage such as storage rooms, tool rooms, and common machine areas. It may be deemed desirable to distinguish these aisles by lines painted on the floor. Areas should be so placed in relation to one another that maximum working relationship exists. For example, areas of founding, forging, and welding have processes and materials in common and should be placed in close proximity to one another. The same might be said of machine metal work, automotives and electricity, as well as photography, printing, bookbinding.

12. **Cleaning Space.** Equipment occupying floor space should always be placed to allow for ease of cleaning around the base.

Warner (53), concerning auxiliary areas, states that storage and supplies for all areas may well be concentrated in a single
storage room for ease of administration and control. No space, shelving, flat surfaces, etc., should ever be provided for storage unless some specific article or material is assigned to it. A place for nothing in particular is a place for everything in general, and for anything belonging in the laboratory there should be an assigned place.

**County Administration.** School administrators in small schools will often rely on the advice of one of the more experienced teachers of industrial arts. In larger school systems, the whole program of practical arts education is often placed in the hands of an administrative director or assistant superintendent. The vital thing is that the responsibilities are recognized, met and handled as problems requiring the best of thought available.

**Schedules and Loads.** There seems to be no uniform practice in determining the time to be allotted to industrial arts. Principals often facilitate the making of the school program by having all periods the same length. Generally where periods are less than 60 minutes, double periods are preferable. Average total time varies from 280 to 450 minutes per week which is desirable for junior and senior high schools. The sizes of classes recommended average from 20 to 24 students per class for a single teacher.

**Personnel.** The industrial arts supervisor, working with the principal, teachers, and students, should be responsible for improving the teaching of industrial arts. As a consultant and leader of
teachers, he should assist them in making tentative plans. His responsibility is to keep in mind the total work of the students and to hold it in relationship to their interests, capacities, experiences, and environing conditions. He should take a series of lessons with the students in order to demonstrate to the teacher a method or procedure that has been under discussion. He should be responsible for knowing and acquainting the teachers with trends in the field, reference books, illustrative materials, samples, new types of materials. He should lead the teachers to share their experiences and to make suggestions in the development of the work. He should help the teachers interpret the value of their work in terms of growth of the students. This means responsibility for leadership in curriculum building and for teacher training in service.

The industrial arts teacher needs to be a highly trained professional person. Also, a good mechanic, an artisan, and a craftsman. He must possess a broad view in regard to the social, economic, and political conditions of the community. He should be of good character and integrity.

Costs. Cost factors should be determined and governed by a thorough analysis of need and use. Supplies and equipment should be purchased in accordance with a definite plan. In the larger centers and cities, supplies are purchased by and through the business manager of the board of education; in the smaller centers,
through the teacher, principal, superintendent, department head, or secretary of the school board.

Replacement Policy. It is important that schools should establish a continuing policy governing replacement of equipment so that each proposal for a new machine to take place of an obsolete or worn-out one will not be subjected to consequent delays that may arise on account of a present local financial situation or the personal viewpoint of some official.

It is advisable that in accordance with their financial ability, schools purchase standard makes of equipment that will withstand hard usage, and that at the time of the purchase, an approximate estimate be made as to length of its use.

Educational Programs. The comprehensive general laboratory may be defined as a type of organization which provides equipment and facilities for activities in two or more industrial areas. Actually, the number of areas represented may vary from two to as many as ten or more. A comprehensive general laboratory might include experiences in woodworking, drawing, metal work, and electricity. A more extensive development might include such additional areas as graphic arts, ceramics, textiles, leatherwork, and transportation. The limiting factors are the equipment and space available, and the interest and abilities of the teacher.

This type of laboratory organization has been developed to meet the exploratory needs of pupils, especially in the one teacher
situation. It has also been used extensively as a beginning experience to be followed by more intensive courses in limited general or unit laboratory and is meeting a real need. This is indicated by the fact that more pupils are enrolled in this type of organization than in any other single industrial arts activity.

The Limited General Shop. This has many of the features of the comprehensive type, but the activities and facilities are limited to work with a single basic material such as wood, or to a closely related group or family of industries such as the electrical industries. An example is general wood laboratory, which might include such activities as cabinet making, carpentry, wood finishing, upholstery, wood carving, wood turning, model making, and pattern making.

The Unit Laboratory. The unit laboratory usually is limited to activities in a single industrial occupation. Examples are machine shop practice, welding, cabinet making, letterpress printing, sheet metal work. Such organization is now found largely to be needed for extensive specialization, or in large city systems where by rotation through many different unit shops pupils may approach the exploratory outcomes of the comprehensive or limited general shop.

Techniques. Some schools rotate classes through four or more fields of activity in the seventh grade and permit a choice of subjects in the eighth grade. Other schools offer printing and woodwork in the seventh grade and metal work and electricity in the
eighth grade, with elections of one subject in the ninth grade. Drawing is sometimes offered as a unit and in other cases is carried along with the shop work as part of planning or industrial arts design. Outcomes are emphasized in terms of knowledges, skills, appreciations, and attitudes.

When two or three teachers are employed in a school, the multiple activities of the comprehensive general laboratory may be divided into groups to avoid duplication of equipment. When this plan is followed, these laboratories become in a sense general laboratoratories for the particular division of work they represent. They are known as general woodwork laboratories, general metal work laboratories, and the like. The general laboratory is sometimes used in very large schools to provide introductory industrial arts experiences before pupils go to unit laboratories.
Chapter VI
THE FIELD STUDY

This chapter presents criteria concerning those elements that comprise a valid program of industrial arts for the secondary schools of North Carolina and is based upon the derivation reported in Chapter V. A Check List has been developed as a result and is to be used as an instrument to record the findings of this investigation. The items of the Check List are consistent with the pattern of organization used throughout the study: A. Philosophy, B. Objectives, C. Curriculum, D. Methods and Devices, E. Physical Setting, F. Organization and Administrative patterns. The conclusions will be closely allied with the recommendations for industrial arts in the public secondary schools for Negroes.

Item A. PHILOSOPHY OF INDUSTRIAL ARTS

Industrial Arts is general education involving orientational and developmental experiences, skills in the use and care of tools, consumer knowledges and appreciations, understanding of and interest in industrial life, and the development of desirable habits and character traits. Industrial arts is implemented as follows:

Orientational. The junior high school provides a period of orientation preliminary to the choice of a career or vocation. These schools are surrounded by organizations for manufacturing,
processing materials, transportation, and communication. The pupils find themselves in a society intent on securing personal comfort and convenience in modern homes. Therefore, the desire to possess the products of industry becomes one of the strongest motivating forces in their lives.

**Technical.** The industrial arts laboratory in the senior high school must answer the question of practical values related to occupational life if it is to hold the interest of the high school pupil. By this time some pupils will have chosen to enroll in trade schools with the purpose of preparing for a payroll job. Others, however, prefer to continue with the general program of high school subjects, including shop work, and to defer for at least two years the specialized training which is essential for entrance into the skilled occupations. Emphasis is being placed on the technical work for boys and girls at the senior high school level with greater stress on specialization.

**Atypical Program for the Handicapped.**

1. **Deaf.** Approximately 3,000,000 children have hearing defects. Some 100,000 of these are deaf, but this is not serious as regards occupational opportunities for these people. There is need for a broad program of industrial arts as a prerequisite to vocational training for persons with this handicap.

2. **Blind.** Programs for the blind in industrial arts should provide for occupations that involve sensitiveness of touch and hearing. Physical motion should be kept well within the limited
range of the blind.

3. Behavior. Work experiences for the nervous types should not be quick or exciting, and for unstable types should be of such nature that it serves as an outlet through absorbing expression of the emotions.

Recreational Types. School clubs are not commonly organized for both boys and girls. Clubs are a means of extending and supplementing the curriculum. This procedure is apparent when clubs are organized to deal with typical children's occupational interests, such as model airplane, construction, handicrafts, archery, boat building, printing, stagecraft, radio, and novelty work. Individual pupils develop special interests which merit further study experience. As school clubs generally admit pupils from various grade levels, membership should be restricted to those with advanced interests.

Everything of a material substance in the home is related to the Industrial Arts program. Motors in electric fans, clocks, washing machine, sewing machines, vacuum cleaner, and refrigerators, all items of furniture, as well as fabrics, metals, and fibers, the use and care of books, and the repair of the house itself, all involve consumer values. The workshop, which developed so broadly during the depression years, is but another evidence of the universality and worth of the subject of industrial arts.
Item B. OBJECTIVES FOR INDUSTRIAL ARTS

From an analysis of the objectives as stated in the federal bulletin (48, 41), the American Vocational Association Guide (3, 18), and Wilber (54) the following statements of objectives for industrial arts for secondary schools appear on the Check List:

1. To provide information about and insofar as possible experiences in the basic processes of many industries.

2. To encourage creative expression in the use of industrial materials.

3. To orient the student to American industry in terms of its origins, organization, materials, processes, operations, products, and occupations.

4. To develop appropriate recreational activities.

5. To increase consumer knowledges to a point where students can select, buy, use, and maintain the products of industry.

6. To develop a degree of skill in a variety of basic processes.

7. To increase an appreciation for good craftsmanship and design in the products of modern industry and in the artifacts from the material cultures of the past.

8. To develop desirable social relationships such as cooperation, tolerance, discipline, and tact.

Item C. INDUSTRIAL ARTS CURRICULUM

The general or diversified shop has been gaining acceptance in many situations and this has modified the unit shop organization to the extent that a group of closely related activities have been developed in metal, wood, electricity, and other groupings. About
the only difference between the unit and general shop is that in
the latter there are no actual partitions dividing the shop into
separate rooms for each unit of work.

In certain educational centers where extensive research has
been done in the field of industrial arts organization, the "labor­
atory of industries" has been promoted. The course units are
selected from broad areas of human technical endeavor. Here the
approach is made by introducing the pupil to power, transportation,
construction, manufacturing, and other designations intended to
convey the broader and less restricted notion of industrial
activities.

Item analysis of offerings for industrial arts in secondary
schools according to two national associations and seven state
departments is shown in Table XVIII.

The scope of offerings for industrial arts in secondary schools
indicates that a listing of these would be broad and selective.
Hence, one can understand the diversification in the listing of
offerings shown in Table XIX.

The activities of the industrial arts curriculum involve the
offerings shown in Table XIX. Hence, the curriculum suggested
is primarily based on these items in the Check List:
Table XVIII

INDUSTRIAL ARTS OFFERINGS IN AMERICAN SECONDARY SCHOOLS

<table>
<thead>
<tr>
<th>Offerings</th>
<th>AVA</th>
<th>AIAA</th>
<th>Ill.</th>
<th>N.J.</th>
<th>Ore.</th>
<th>Pa.</th>
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<td>x</td>
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<td>x</td>
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<td>x</td>
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<tr>
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<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Crafts</td>
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<td>x</td>
<td>x</td>
<td></td>
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<td>Drawing</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>Home Mechanics</td>
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<td></td>
<td>x</td>
<td></td>
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<td>x</td>
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<td>x</td>
<td>x</td>
<td></td>
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<td>Plastics</td>
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<td>11</td>
<td>12</td>
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### Table XIX

**INDUSTRIAL ARTS OFFERINGS FOR SECONDARY SCHOOLS**

<table>
<thead>
<tr>
<th>Acetylene welding</th>
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<td>Art leather</td>
<td>Plumbing</td>
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<tr>
<td>Art metal</td>
<td>Pottery</td>
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<td>Auto mechanics</td>
<td>Printing</td>
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<td>Sheet metal</td>
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<td>Book binding</td>
<td>Silk screen printing</td>
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<td>Cabinet making</td>
<td>Textiles</td>
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<td>Carpentry</td>
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<td>Forging</td>
<td>Wood carving</td>
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<td>Wood working</td>
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<td>Keene cement</td>
<td>Other subjects:</td>
</tr>
<tr>
<td>Machine shop</td>
<td></td>
</tr>
<tr>
<td>Mechanical drawing</td>
<td></td>
</tr>
<tr>
<td>Model making</td>
<td></td>
</tr>
</tbody>
</table>
1. Designing experiences are provided for in wood, metal, plastics, and ceramics.

2. Dimensional sketches are made of items to be constructed in the school laboratory or home workshop.

3. A degree of skill is developed in making working drawings for use in the laboratory, in other classes, and elsewhere.

4. Illustrations, designs, diagrams, and working drawings are studied to learn about and evaluate the materials and techniques in commercial articles.

5. Class discussions are provided of working conditions, required skills, and achievements in representative industries and occupations.

6. Tools and equipment are cared for by students as individuals in a personnel organization.

7. Industrial products are studied and selected in regard to their extent, variety, and use.

8. Industries are studied with respect to the kinds of workers, types of jobs, opportunities, wages, working hours, as well as the conditions concerned.

9. Home workshop and other out-of-school activities are practiced and encouraged.

10. Health and safety are practiced.

11. Atypical cases: Blind, hard of hearing, and behavior students are provided experiences in representative areas.

12. Handicraft activities are provided.

Metals:

1. Experiences are provided in measuring with a rule, caliper, micrometer, and protractor.

2. Provisions are made for layout, cutting, drilling, boring, and reaming holes.
3. Students develop a degree of skill in bending, twisting, shaping, and forming metal.

4. Experiences are provided for processing metal sheets, and angles.

Ceramics:

1. Shaping, casting, and throwing experiences.

2. Plaster casts are made and used.

3. Decoration is employed in painted and slip tracing, incised decoration, and glazing.

Construction:

1. Forms are built and concrete is poured.

2. Projects involve masonry materials, tools, equipment, and supplies.

3. House wiring, radio, television, cooking utensils, and household appliances are used.

4. Plumbing, heating, refrigeration, and servicing plumbing fixtures are involved.

Transportation and Power:

1. Bicycles, marine transportation, automobiles, aeronautics, railroads, and outboard motors.

2. Disassembly, servicing, and cleaning essential parts are jobs that are performed.

Item D. METHODS AND DEVICES

Teaching methods have been affected by improved physical equipment, contributions of highly professional teachers, and general increase in class size.

The industrial arts teacher needs to be a highly trained professional person and also a good craftsman. In addition to the
craft skills he must bring to the school organization the same college training and the same breadth of view in regard to social, economic, and political conditions of society as the rest of the school staff. His social viewpoint must be especially comprehensive and exemplified by his understanding of his pupils. It is a combination of these human qualities, professional preparation for teaching, and resultant understanding of social and economic needs, that has stimulated some very superior teaching.

The manner in which laboratory classes are conducted has been forced upon the industrial arts teacher. For example, the pupil personnel system of managing a laboratory so that it becomes a self-governing unit was necessarily utilized as a device for handling large classes. The use of instruction sheets and working plans puts upon a pupil the challenge to solve his own problem in a way that no other subject in the curriculum can possibly equal.

A good library is an essential part of the equipment of every industrial arts laboratory, and evidence of its frequent use is an indication of good teaching. Other important teaching aids are bulletin boards, notebooks, reports by pupils, films and slides, models, charts, cut-away photographs, catalogs of tools, material and equipment, industrial information, illustrative materials, permanent and temporary exhibits, school and other libraries, museums, and visits to factories or other industrial establishments. The Check List reads as follows:
1. Instructor has general and specific objectives in writing for each learning unit.

2. Plans of each day's work are used.

3. A laboratory library is provided with a variety of textbooks and references.

4. Consumer literature such as buyers' guides, periodicals, and industrial pamphlets are used.

5. Occupational monographs are used.

6. Trade journals are used.

7. Materials suggesting projects and manipulative activities are used.

8. Plans of suggested projects are used.

9. Teacher prepared materials such as assignment, job operation, and information sheets are used.

10. Planning materials are used.

11. Industrial exhibit materials are used.

12. A variety of audio-visual aids such as bulletin board, chalkboard, field trips, exploded views, films, filmstrips, models, mock-ups, radio, and television are employed.

13. Evaluation is an integral part of the program.

14. Manipulative activities are evaluated in terms of number, quality, and performance.

15. Standardized tests are employed.

16. The interpretation of test results is used in planning further instruction.

17. Students participate in evaluation.

18. Handicraft activities are evaluated with respect to the extent of their use, as well as by their quality.

19. Comparisons are made between the products of the school and of industry.
20. Individual progress is recorded and used for guidance purposes.

21. Both teacher and students realize that tests should be used to reveal strengths and weaknesses.

Table XX shows an item analysis of the methods and devices suggested by five state department publications: Illinois, Iowa, Pennsylvania, Virginia, and Utah. These were selected because the methods and devices presented in their publications included those presented in other association and state department publications. They were also more recent publications than most of the others.

Table XX presents data showing that four methods and devices were very common: Models and Mockups, Motion Pictures and Filmstrip, Student Management of Tools and Equipment, and Student Selection of Projects. Four methods and devices were fairly common: Layouts or Patterns, Plans of Projects, Pupil-teacher Planning, and Use of Course Outlines. Five methods were found to be less common: Demonstration, Exhibits and Displays, Field Trips, Instruction Sheets, and Roll Call. Fourteen of these showed very little agreement: Class Discussion, Conference, Experimentation and Research, Illustration, Individual Instruction, Lecture, Library Materials, Observation, Question and Answer, Recitation, Records, Scientific Arrangement of Laboratory, Teaching a Number of Areas Simultaneously, and Use of Standardized Tests. Production
Table XX

METHODS AND DEVICES FOR TEACHING INDUSTRIAL ARTS

<table>
<thead>
<tr>
<th>Items</th>
<th>Ill.</th>
<th>Iowa</th>
<th>Penn.</th>
<th>Utah</th>
<th>Va.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Models and Mock-ups</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Films</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Student Management</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Student Selections</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Layouts or Patterns</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Plans of Projects</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Pupil-teacher Planning</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Use of Course Outline</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Demonstration</td>
<td></td>
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<td></td>
<td>x</td>
<td></td>
<td>2</td>
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<tr>
<td>Exhibits and Displays</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
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</tr>
<tr>
<td>Field Trips</td>
<td>x</td>
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<td>x</td>
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<tr>
<td>Instruction Sheets</td>
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<td></td>
<td></td>
<td>x</td>
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<td>Roll Call</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Class Discussion</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
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<tr>
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<td>Individual Instruction</td>
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<tr>
<td>Lecture</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Library Materials</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Observation</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Question and Answer</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Recitation</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Records</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Laboratory Arrangement</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Multiple Areas</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Standardized Tests</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Total 11 8 9 19 5
line methods and techniques are incorporated in the following section.

Item E. THE PHYSICAL SETTING

Ten Steps in Planning School Shops Include:

1. The educational activities in the laboratory should be described in some detail. The instructor, the supervisor, the administrator, the advisory committee, and the group participating in the educational program should cooperate in the planning.

2. The teaching load must be determined, i.e. the number of students to be accommodated and the time available for instruction.

3. A preliminary conference should be held with the architect to discuss educational activities, shop load, standards, building design, space considerations, and cost limitations for guidance in further planning. Visits with the architect to well planned school and industrial shops are recommended.

4. A study should be made of current codes and standards for the construction of industrial arts laboratories for the development of a reference check list.

5. A list should be made of tools, equipment, and supplies.

6. The location of principal areas, facilities, and auxiliary rooms should be decided.

7. A preliminary layout should be drawn to scale showing location of principal areas, facilities, auxiliary rooms, and equipment.
8. The architect should be assisted in the revision of the preliminary plan, and additional planning problems discussed with him. Detailed sketches of building equipment should be provided at this time.

9. A description of the layout and a set of specifications should be prepared for the architect.

The Check List includes:

1. The industrial arts laboratory site is adjacent to or connected with a principal corridor, and is near a driveway that will provide easy access for automobiles and trucks. Adequate site area is left undeveloped for future expansion.

2. Laboratory building or wing is one story in height, and on the first floor.

3. Space assigned for industrial arts activities is so located or soundproofed as not to inconvenience other learning activities.

4. A dado of 60 inches.

5. Shelves, filing cabinets, or similar facilities are provided for books, magazines, and other reference materials.

6. An average of at least 75 square feet of floor space per student is provided. Machine areas may require additional space while mechanical drawing and bench areas may require less.

7. The open laboratory area is rectangular in shape with a width to length ratio of 1:1 1/2 to 1:2.

8. Laboratory ceiling height is at least 12 feet.

9. Appropriate hand tools are provided.

10. Equipment is selected with the age level in mind.
11. Appropriate machines are provided.

12. The office of the instructor is located in such a way as to provide him with a clear view of all activities being carried on in the laboratory.

13. Aisles 4 feet in width are provided for student traffic between all areas and points of common usage, such as storage rooms, tool rooms, and common machine areas.

14. Machines around which danger zones exist are adequately guarded and lines painted to indicate danger zones.

15. The laboratory has at least two exits opening outward, one of which is larger than the largest piece of equipment or instructional project to be moved in or out of the laboratory.

16. Storage space and facilities are provided for supplies as well as projects.

17. Machines are adequately mounted to prevent vibration and to reduce noise.

18. Lockers are provided for the storage of personal belongings, and located in such a way that they may be supervised by the instructor.

19. First aid supplies are available.

20. Gas, electrical, water, and compressed air outlets are adequate.

21. Washing facilities are supplied with hot and cold water. A drinking fountain is included in the laboratory.

22. Fire extinguishers are available.

23. Waste and scrap are disposed of in covered metal containers.

24. Tool rooms, racks, or panels are designed so the instructor can observe them.

25. A small classroom (20' x 30') is available and equipped with a teacher's desk, demonstration table or
bench, tables with chairs, ten to twenty feet of chalkboard, and twenty feet of bulletin board.

26. Storage space and facilities are provided for tools and incidental equipment.

27. Space is provided for students to plan their projects and to conduct conference sessions.

28. Partitions between laboratories are so constructed that they can be removed. The partitions are free of conduits and other installations.

29. Space is provided for assembling projects in their respective areas.

30. A suitable finishing area is provided.

31. Provisions are made for darkening the room, and outlets for the use of projectors and other audio-visual equipment.

32. The floor is made or covered to insure safety. End grain flooring for cold work areas and concrete for hot metals areas are desirable.

33. Work benches are selected for convenience and safety.

34. General lighting up to 100 foot candles at working height (machines providing for close tolerances have additional individual lighting), is provided for work in each part of the laboratory.

35. Ceilings are painted an off-white with light colored walls and trim.

36. Machinery and equipment are painted in colors that will promote safety, and minimize eye fatigue.

37. High visibility colors are used on control levers and switch boxes, with black for starting button and red for stop button.

38. Ventilation provisions insure healthful working conditions. Mechanical ventilation is provided to exhaust fumes and vapors.
39. The heating system maintains comfortable and healthful conditions at all times (68 degrees for laboratories and 70 degrees for classrooms).

The Federal Interpretation bulletin (48) enumerates the principles for the following section:

**Item F. ORGANIZATION AND ADMINISTRATIVE PATTERN**

The small school program should offer a variety of experiences pertinent to the needs of the students. Emphasis may be placed on the major areas of industry in at least three to six areas. The municipal school program may provide experiences in all of the major industrial areas such as power, communications, construction, transportation, and manufacture.

**Schedules and Loads.** In schools where class periods are less than 60 minutes, there should be at least two double periods per week for the industrial arts laboratory. The total time for industrial arts in the secondary school should range from 90 to 450 minutes per week. There should be one industrial arts teacher to every 300 students in the total enrollment. The industrial arts class load per teacher should range from 20 to 25 students per class. There should be three to five activity areas with 5 or 8 students per area respectively.

**Personnel.** The industrial arts teacher should possess a thorough training in industrial arts. He must have a good teaching personality and a natural aptitude for working with tools, machines,
and materials. He must be able to work well with others, command the respect of the school faculty, and the members of the community. The industrial arts teacher should be active professionally. It is important for him to make contributions to professional publications as well as subscribe to them. He should be active in community affairs. It is desirable that he have some experience in industry. He should possess good health and moral integrity.

Supervisory. In large cities the responsibility for promoting the industrial arts program is usually centered in a supervisor working directly under the superintendent or one of his assistants. The point to be emphasized is the importance of recognizing the special needs of industrial arts, not only in the matter of the curriculum, but also in equipment and building arrangements. In planning new buildings the supervisor should acquaint the architect with the details of laboratory needs.

Budgetary. Supplies are an essential part of any industrial arts program and should be provided by the Board of Education. However, when the pupils' work results in products which they are permitted to keep, they should pay for the material used. To initiate an industrial arts program in even the smallest school requires expenditures for hand tools, power machines, supplies, installations and the like. The type of program will govern the cost of the original installations. Proper attention should always be given to the replacement of obsolete, broken and dangerous machinery, small hand tools, and to the maintenance of
the shop. It is expected that teachers will perform minor maintenance work in the shop.

The organization and administrative section of the Check List now follows:

1. Industrial arts courses or activities are available to all boys in grades 9 through 12.

2. Industrial arts courses or activities are available to girls on an elective basis.

3. Opportunity is provided for increased specialization in industrial arts according to student maturity.

4. The industrial arts laboratory is a comprehensive type depending upon need.

5. Wholesome relationships are promoted with students, parents, teachers, industry, and patrons.

6. Public relations are maintained by employing the media of curriculum activities, fairs, open house, press, radio, and special programs.

7. Evaluation is a continuous process.

8. Professional services are rendered the industrial arts program when needed.

9. A system of records is used in accounting for equipment, materials, and supplies.

10. An accident record is maintained.

11. There should be at least two 45 minute periods, or 90 minutes for industrial arts classes daily.

12. The maximum teacher-student ratio is 1:24.

13. The industrial arts teacher-student ratio is 1:100.

14. The industrial arts teacher has had preparation in laboratory courses in a variety of broad areas.
15. He has had preparation in first aid and safety.

16. He has had work experience in industry.

17. He has had preparation in the history and philosophy of industrial arts.

18. He participates in one or more industrial arts associations or societies.

19. He reads current industrial arts publications.

20. He does research in industrial arts education.

21. He possesses skill in using and demonstrating industrial tools, machines, and processes.

22. He practices safety and economy.

23. He possesses good health and character.

24. There is a local coordination of effort.

25. There are minimum standards for selection of industrial arts personnel.

26. An annual budget is approved for new equipment, instructional materials, supplies, maintenance, repairs, and replacements.

27. Students pay for the materials in the projects they take home.

28. In-service training is a part of the program.

29. Salaries of industrial arts teachers are equivalent to those in other subject matter areas.

30. Activities of the industrial arts program are publicized through the school newspaper, public press, radio, television, exhibits, displays, fairs, chapel programs, and the like.
SUMMARY

The derived elements of this chapter were employed in the Check List. They were according to number:

1. Objectives 8
2. Offerings 28
3. Curriculum 25
4. Methods and Devices 21
5. Physical Setting 39
6. Organization and/or Administration 30

Total 151
Chapter VII

FINDINGS OF THE FIELD STUDY

This chapter is concerned with reporting the results of the findings of the field study presented in Chapter VI. Thirty-six industrial arts programs for Negroes in North Carolina are discussed with reference to their: (1) general information, (2) objectives, (3) offerings, (4) curricula, (5) methods and devices, (6) physical settings, (7) organization and administration, and (8) status.

GENERAL INFORMATION

The types of schools, total school enrollment in secondary grades, and number of male and female students enrolled in industrial arts by grade levels are shown below:

Table XXI

INDUSTRIAL ARTS ENROLLMENTS

<table>
<thead>
<tr>
<th>Grade</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>256</td>
<td>0</td>
<td>256</td>
</tr>
<tr>
<td>8</td>
<td>1335</td>
<td>0</td>
<td>1335</td>
</tr>
<tr>
<td>9</td>
<td>1100</td>
<td>4</td>
<td>1104</td>
</tr>
<tr>
<td>10</td>
<td>744</td>
<td>14</td>
<td>758</td>
</tr>
<tr>
<td>11</td>
<td>425</td>
<td>13</td>
<td>438</td>
</tr>
<tr>
<td>12</td>
<td>265</td>
<td>32</td>
<td>297</td>
</tr>
<tr>
<td>Total</td>
<td>4,125</td>
<td>63</td>
<td>4,188</td>
</tr>
</tbody>
</table>

Total enrollment in secondary grades 20,999

107
Five junior high schools, 9 senior high schools, and 22 union schools offer industrial arts. There are 20,999 students enrolled in the 36 schools: 4,188 or only 20 percent of the students are enrolled in industrial arts courses,—4,125 boys and 63 girls. Fifty-eight percent of these students drop out of secondary school before graduation. The inference is that they will go into the labor market with very little occupational preparation or guidance and without any basic skills to sell. All students should have an opportunity to enroll in industrial arts courses, in order to explore their potentials for industrial occupations and to become intelligent consumers.

OBJECTIVES

The number of favorable and unfavorable responses to eight items are shown in Table XXII. Favorable responses were reported for all eight objectives. This establishes that the instructors were thinking, planning, and organizing their programs within a frame of reference.
Table XXII

OBJECTIVES OF 36 PUBLIC SECONDARY SCHOOL PROGRAMS
OF INDUSTRIAL ARTS FOR NEGROES IN NORTH CAROLINA, 1955

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To encourage creative expression in the use of industrial materials.</td>
<td>35</td>
<td>1</td>
</tr>
<tr>
<td>2. To provide information about and in so far as possible experiences in the basic processes of many industries.</td>
<td>33</td>
<td>3</td>
</tr>
<tr>
<td>3. To orient the student to American industry in terms of its origins, organization, materials, processes, operations, products, and occupations.</td>
<td>33</td>
<td>3</td>
</tr>
<tr>
<td>4. To increase an appreciation for good craftsman ship and design in the products of modern industry and in the artifacts from the material cultures of the past.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>5. To develop desirable social relationships such as cooperation, tolerance, leadership, self-discipline, and tact.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>6. To develop recreational activities appropriate to industrial arts or technology.</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>7. To increase consumer knowledge to a point where students can select, buy, use and maintain the products of industry intelligently.</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>8. To develop a degree of skill in a variety of basic industrial processes.</td>
<td>26</td>
<td>10</td>
</tr>
</tbody>
</table>
OFFERINGS

These 16 items are ranked according to the percentage of favorable responses as shown below.

Table XXIII
OFFERING OF 36 PUBLIC SECONDARY SCHOOL PROGRAMS

<table>
<thead>
<tr>
<th>Items</th>
<th>Freq.</th>
<th>Items</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Drawing</td>
<td>28</td>
<td>Electricity</td>
<td>7</td>
</tr>
<tr>
<td>Woodworking</td>
<td>25</td>
<td>Leather Craft</td>
<td>6</td>
</tr>
<tr>
<td>Cabinetmaking</td>
<td>22</td>
<td>Plastics</td>
<td>5</td>
</tr>
<tr>
<td>Upholstery</td>
<td>19</td>
<td>Gas Welding</td>
<td>4</td>
</tr>
<tr>
<td>Carpentry</td>
<td>16</td>
<td>Auto Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>Sheet Metal</td>
<td>15</td>
<td>Masonry</td>
<td>4</td>
</tr>
<tr>
<td>Art Metal</td>
<td>13</td>
<td>Machine Shop</td>
<td>3</td>
</tr>
<tr>
<td>Pattern Making</td>
<td>8</td>
<td>Photography</td>
<td>3</td>
</tr>
</tbody>
</table>

Only three items ranked favorably. They were Mechanical Drawing, Woodworking, and Safety.

Students enrolled in these programs apparently are not receiving the variety of experiences which typify their needs in a society where industrial versatility is required. Neither are they allowed to come in contact with information that will broaden their knowledge and help them choose wisely the products of such a society. Hence,
the offerings in these programs need to be extended to include: electricity, textiles, ceramics, metals, power and transportation, . . .

CURRICULA

Twenty-five items listed under curricula are shown in Table XXIV. Seven curricula items were reported favorably. Others ranged from "measuring experiences in metals" down to "experiences in working with bicycles and automobiles."

Experiences in the curriculum areas should be broadened in ceramics, power and transportation, construction, metals, woodworking and drawing.

Table XXIV

INDUSTRIAL ARTS CURRICULA IN 36 PUBLIC SECONDARY SCHOOLS

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. A degree of skill is developed in making working drawings for use in the laboratory, in other classes, and elsewhere.</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>2. Illustrations, designs, diagrams, and working drawings are studied to learn about and evaluate the materials and techniques in commercial articles.</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>3. Class discussions of working conditions, required skills, and achievements in representative industries and occupations provided.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>Items</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>4. Dimensional sketches are made of items to be constructed in the school laboratory or home workshop.</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td>5. Tools and equipment are cared for by students as individuals in a personnel organization.</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td>6. Designing experiences are provided for in wood, metal, plastics, and ceramics.</td>
<td>29</td>
<td>7</td>
</tr>
<tr>
<td>7. Home workshop and out-of-school activities are practiced and encouraged.</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>8. Health and safety are practiced.</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>9. Industrial products are studied and selected in regard to their extent and variety as made here and abroad, and in relation to our daily living.</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>10. Handicraft activities are provided.</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>11. Industries are studied in respect to kinds of workers, types of jobs, opportunities, wages and working hours and conditions.</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>12. Atypical cases: Blind, hard of hearing, and behavior students are provided experiences in the representative areas.</td>
<td>4</td>
<td>32</td>
</tr>
</tbody>
</table>

**Metals**

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Experiences are provided in measuring with a rule, calipers, micrometers, and protractor.</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>2. Provisions are made for layout, cutting, drilling, boring and reaming holes.</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>3. Students develop a degree of skill in bending, twisting, shaping and forming metal.</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>4. Experiences are provided for purchasing metal sheets, and angles.</td>
<td>14</td>
<td>22</td>
</tr>
</tbody>
</table>
Table XXIV (Continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceramics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Plaster casts are made and used.</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>2. Decoration is employed in painted and slip tracing, inlaid decoration, and glasing.</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>3. Shaping, casting, and throwing experiences are provided in pottery making.</td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. House wiring, radio, television, cooking utensils, and household appliances are worked on.</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>2. Projects are constructed involving masonry materials, tools, equipment and supplies.</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>3. Plumbing, heating, refrigeration, and servicing of plumbing fixtures are experiences involved.</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>4. Forms are built and concrete is poured.</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td><strong>Power and Transportation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Disassembly, servicing, and cleaning essential parts are jobs that are performed.</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>2. Experiences are provided in working with bicycles, marine transportation, automobiles, aeronautics, railroads, and outboard motors.</td>
<td>8</td>
<td>28</td>
</tr>
</tbody>
</table>
METHODS AND DEVICES

Twenty-one items are listed below with respect to the number of favorable responses.

Table XXV

METHODS AND DEVICES USED IN 36 PUBLIC SECONDARY SCHOOL PROGRAMS FOR NEGROES IN NORTH CAROLINA, 1955

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Evaluation is an integral part of the teaching-learning activities.</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>2. Plans of suggested projects are available.</td>
<td>33</td>
<td>3</td>
</tr>
<tr>
<td>3. Materials suggesting projects and manipulative activities are available.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>4. Instructor has general and specific objectives in writing for each learning unit.</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td>5. Plans for each day's work are available.</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>6. Manipulative activities are evaluated in terms of number, quality, and performance.</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>7. Both teacher and students realize that tests should be used to reveal strengths and weaknesses.</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>8. Teacher prepared materials such as assignment, job operation, and information sheets are available.</td>
<td>29</td>
<td>7</td>
</tr>
<tr>
<td>9. Industrial display, and exhibit materials are used.</td>
<td>29</td>
<td>7</td>
</tr>
<tr>
<td>10. Critical comparisons are made between the products of the school and industry.</td>
<td>29</td>
<td>7</td>
</tr>
</tbody>
</table>
Table XXV (Continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Handicraft activities are evaluated in respect to the extent of their use, as well as by their quality.</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>12. Individual progress is recorded and used for guidance purposes.</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>13. Drawing textbooks and planning materials are accessible.</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>14. A variety of audio-visual aids such as films, filmstrips, chalkboard, bulletin-board, radio, television, models, mock-ups, field trips, and exploded views are employed.</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>15. Consumer literature such as buyers guides, periodicals, and industrial pamphlets are available.</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>16. The interpretation of test results is used in planning further instruction.</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>17. Students participate in evaluation.</td>
<td>26</td>
<td>11</td>
</tr>
<tr>
<td>18. Trade journals are available.</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>19. A laboratory library is provided with a variety of textbooks and reference materials.</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>20. Standardized objective tests are employed.</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>21. Occupational monographs are available.</td>
<td>17</td>
<td>19</td>
</tr>
</tbody>
</table>

Seventeen items in this group ranked above 70 percent. The remaining four items ranged from two items at 67 percent down to two items at 48 percent. Apparently a great variety of methods and
devices were being used by teachers in these programs, which would indicate that what was being taught to the individuals enrolled may have been taught fairly well. However, there were too few reference materials in all instances. Trade journals, a library, objective tests, and occupational monographs enrich the informational aspects of the industrial arts programs.

PHYSICAL SETTINGS

The atmosphere and climate in which the industrial arts program operates is of paramount importance in obtaining the objectives of the program. Table XXVI shows the results of the investigation for the programs studied.

Twelve items were reported favorably in this aspect, i.e. ranked above 70 percent. They ranged from 81 percent downward to 70 percent. Only 33 percent of the items listed showed evidence of there being an adequate laboratory that would aid in the proper surroundings for optimum growth and development of the youth. Sixty-six percent of the items listed were revealed to be below acceptable standards.

The industrial arts laboratories are not adequately designed on a scientific basis to afford youth the best possible growth and development. Lack of space for the children, lighting below 100 foot candles, unpainted walls and ceilings, poor ventilation, no fire extinguishers,—all these indicate that the objectives for industrial arts are not being accomplished to their fullest extent.
Table XXVI

PHYSICAL SETTINGS IN 36 PUBLIC SECONDARY SCHOOL PROGRAMS FOR NEGROES IN NORTH CAROLINA, 1955

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The industrial arts laboratory site is adjacent to or connected</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with a principal corridor, and is near a driveway that will provide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>east access for automobiles and trucks. Adequate site area is left</td>
<td></td>
<td></td>
</tr>
<tr>
<td>undeveloped for future expansion.</td>
<td>29</td>
<td>7</td>
</tr>
<tr>
<td>2. The laboratory has at least two exit doors (all opening outward)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>one of which is larger than the largest piece of equipment or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>instructional project to be moved in or out of the laboratory.</td>
<td>29</td>
<td>7</td>
</tr>
<tr>
<td>3. Laboratory ceiling height is at least 12 feet.</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>4. The heating system maintains comfortable and healthful conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at all times. (68° for laboratories and 70° for classrooms.)</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>5. Storage space and facilities are provided for tools and metal</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>equipment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Equipment is selected with the age level in mind.</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>7. Machinery and equipment are painted in colors that will promote</td>
<td></td>
<td></td>
</tr>
<tr>
<td>safety, and minimize eye fatigue.</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>8. Appropriate hand tools are provided.</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>9. Tool rooms, racks, or panels are designed so the instructor can</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>observe them easily.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Laboratory building or wing is one story in height and on the</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>first floor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Shelves, filing cabinets, or similar facilities are provided for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>books, magazines, and other reference materials.</td>
<td>25</td>
<td>11</td>
</tr>
</tbody>
</table>
Table XXVI (Continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Appropriate machines are provided</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>13. Aisles 4 feet wide are provided for student traffic between all areas and points of common usage, such as storage rooms, tool rooms, and common machine areas.</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>14. High visibility colors are used on control levers and switch boxes, with black for starting button and red for stop button.</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>15. Work benches are selected for convenience and safety.</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>16. Lighting up to 100 foot candles at working height (machines providing for close tolerances have additional individual lighting) is provided for work in each part of the laboratory.</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>17. Fire extinguishers are available.</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>18. First aid supplies are available.</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>19. Storage space and facilities are provided for supplies as well as for student projects.</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>20. Machines are adequately mounted to prevent vibration and reduce noise.</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>21. The office of the instructor is located in such a way as to provide him with a clear view of all activities being carried on in the laboratory.</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>22. Ceilings are painted an off-white with light colored walls and trim.</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>23. Ventilation provisions insure healthful working conditions. Mechanical ventilation is provided to exhaust fumes and vapors.</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>24. Space is provided for assembling projects in their respective areas.</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>25. Space assigned for industrial arts activities is so located or sound proofed as not to inconvenience other learning activities.</td>
<td>20</td>
<td>16</td>
</tr>
</tbody>
</table>
Table XXVI (Continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>26. The floor is made or covered with material to insure safety. End grain flooring for cold work areas and concrete for hot metals areas are desirable.</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>27. The open laboratory area is rectangular in shape with a width to length ratio of 1:1½ to 1:2.</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>28. Machines around which danger zones exist are adequately guarded and lines painted to indicate danger zones.</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>29. Waste and scrap are disposed of in covered metal containers.</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>30. A small classroom (20' x 30') is available and equipped with a teacher's desk, demonstration table or bench, tables with chairs, ten to twenty feet of bulletin board.</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>31. A suitable finishing area is provided.</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>32. Lockers are provided for the storage of personal belongings, and located in such a way that they may be supervised by instructor.</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>33. Space is provided for students to plan their projects and conduct conference sessions</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>34. An average of at least 75 sq. ft. of floor space per student is provided. (Machine areas may require additional space while mech. drawing and bench areas require less.)</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>35. Gas, electrical, water, and compressed air outlets are adequate.</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>36. Washing facilities are supplied with hot and cold water. A drinking fountain is included in the laboratory.</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>37. Fenestration is 60 inches.</td>
<td>11</td>
<td>25</td>
</tr>
</tbody>
</table>
Table XXVI (Continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>38. Provisions are made for darkening the room, and outlets for the use of projectors and other audio-visual aid equipment.</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>39. Partitions between laboratories are so constructed that they can be removed to convert two laboratories into one, three into two, and other space arrangements in future years. The partitions are free of conduit and other installations.</td>
<td>10</td>
<td>26</td>
</tr>
</tbody>
</table>

ORGANIZATION AND ADMINISTRATION

This phase of the program presents 33 items as shown below according to the number of favorable responses.

Table XXVII

INDUSTRIAL ARTS ORGANIZATION AND ADMINISTRATION OF 36 PUBLIC SECONDARY SCHOOL PROGRAMS

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salaries of the industrial arts teachers are equivalent to those of teachers in other subject matter areas.</td>
<td>36</td>
<td>0</td>
</tr>
<tr>
<td>2. The industrial arts teacher possesses skill in using and demonstrating industrial tools, machines, and processes.</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>3. He possesses good health and character.</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>4. He has had preparation in first aid and safety.</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>5. He has had preparation in laboratory courses in a variety of areas.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>6. He practices safety and economy.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>Items</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>7. He has had preparation in the history and philosophy of industrial arts.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>8. Students pay for the materials in the projects they take home.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>9. An accident record is maintained.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>10. The industrial arts teacher reads current industrial arts publications.</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>11. He holds a Bachelors Degree.</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>12. He has had work experience in industry.</td>
<td>29</td>
<td>7</td>
</tr>
<tr>
<td>13. He participates in one or more industrial arts associations or societies</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>14. Evaluation is a continuous process.</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>15. Professional services are rendered the industrial arts program when needed.</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>16. A system of records is used for accounting of equipment, materials, and supplies.</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>17. Activities of the industrial arts program are publicized through the school newspaper, public press, radio, television, exhibits, displays, fairs, chapel programs, and the like.</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>18. Healthy relationships are promoted with students, teachers, parents, and industry.</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>19. Public relations are maintained by employing the media of curriculum activities, press, radio, fairs, open house, and special programs.</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>20. The industrial arts teacher does research in industrial arts education.</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>21. There are minimum standards for selection of industrial arts personnel.</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>22. Industrial arts courses or activities are available to all boys in grades 9 through 12.</td>
<td>25</td>
<td>11</td>
</tr>
</tbody>
</table>
Table XXVII (Continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. The industrial arts laboratory is a comprehensive type depending upon need.</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>24. The maximum teacher-student ratio is 1:24.</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>25. Opportunity is provided for increased specialization in industrial arts according to student maturity.</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>26. An annual budget is approved for new equipment, instructional materials, supplies, maintenance, repairs, and replacements.</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>27. Inservice training is a part of the industrial arts program.</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>28. The industrial arts teacher-student ratio is 1:200.</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>29. There is local coordination of effort in industrial arts.</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>30. Industrial arts courses or activities are available to girls on an elective basis.</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>31. Periods for industrial arts are at least two 45 minute periods or 90 minutes per class daily.</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>32. One industrial arts teacher has a maximum of four classes per week.</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>33. Two industrial arts teachers have a maximum of 3 phases per teacher at any one time.</td>
<td>4</td>
<td>32</td>
</tr>
</tbody>
</table>

Twenty-three items reported favorably, while 10 items were unfavorable. The training and salaries of teachers were satisfactory. This is due to the fact that North Carolina has minimum standards for industrial arts teachers and a uniform salary schedule for teachers of regular subjects and industrial arts.
Unfavorable responses were reported on items such as budget, in-service training, teacher-student ratio, opportunities for girls, and teaching assignments. There is need for leadership on the local and state levels to provide for supervision, selection, guidance, and planning these programs throughout the State.

STATUS OF THE PROGRAMS

The status of industrial arts programs for Negroes in North Carolina is presented in the table below.

Table XXVIII

SUMMARY OF INDUSTRIAL ARTS STATUS IN THE 36 PUBLIC SECONDARY SCHOOL PROGRAMS FOR NEGROES IN NORTH CAROLINA, 1955

<table>
<thead>
<tr>
<th>No. Categories</th>
<th>Favorable</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Objectives</td>
<td>248</td>
<td>288</td>
</tr>
<tr>
<td>16 Offerings</td>
<td>182</td>
<td>576</td>
</tr>
<tr>
<td>25 Curricula</td>
<td>460</td>
<td>900</td>
</tr>
<tr>
<td>21 Methods and Devices</td>
<td>572</td>
<td>756</td>
</tr>
<tr>
<td>39 Physical Settings</td>
<td>828</td>
<td>1,404</td>
</tr>
<tr>
<td>33 Organization and Administration</td>
<td>834</td>
<td>1,188</td>
</tr>
<tr>
<td><strong>142</strong></td>
<td><strong>3,124</strong></td>
<td><strong>5,112</strong></td>
</tr>
</tbody>
</table>

There were 5,112 responses to the 142 items included in the check list. Of these 3,124, or an average of 62 percent were favorable. Three phases were reported as favorable with reference to
general status. They were: (1) Objectives, 86 percent, (2) Methods and Devices, 75 percent, and (3) Organization and Administration, 70 percent.

Industrial arts programs in secondary schools for Negroes of North Carolina were found to be below acceptable standards. This forms the bases for projecting a suitable program for industrial arts in Chapter IX.
Chapter VIII
SUMMARIES AND CONCLUSIONS FOR SIX SELECTED PROGRAMS

Chapter VI involved the derivation of a check list that was consistent with the organizational pattern (philosophy, objectives, curriculum, methods and devices, physical setting, organization and administrative patterns). This device was used in recording data for the 36 industrial arts programs studied.

This chapter presents an item analysis of the findings and recommendations presented in the check list for six industrial arts programs. These were selected as representative samplings of two programs each from the three geographic divisions of the State of North Carolina. Schools 1 and 32 were from the Piedmont district, 2 and 19 from the Western district, and 5 and 20 from the Coastal Plains district.

Each of the six programs was analyzed and recommendations presented with respect to items listed under the general categories of: (1) enrollment, (2) objectives, (3) offerings, (4) curriculum, (5) methods and devices, (6) physical setting, and (7) organization and administrative pattern. These analyses follow:

SCHOOL NO. 1

Findings

Enrollment: Forty ninth grade boys were enrolled in industrial arts courses. This was approximately 10 percent of the total
enrollment of 372 in the secondary grades. There were no girls enrolled in these courses.

**Objectives.** It was agreed that the industrial arts program should (1) provide information and experiences in basic processes of many industries, (2) encourage creative expression in the use of industrial materials, (3) orient the student to American industry, (4) develop recreational activities, (5) increase consumer knowledges, (6) develop a degree of skill, (7) increase appreciation of good craftsmanship, and (8) develop social relationships such as cooperation, tolerance, leadership, self-discipline, and tact.

**Offerings.** Subject matter courses were: (1) mechanical drawing, (2) woodworking, (3) upholstery, and (4) sheet metal.

1. General experiences were provided in:
   a. Working drawings
   b. Illustrations
   c. Discussions of working conditions
   d. Dimensional sketches
   e. Personnel organization
   f. Health and safety
   g. Study and selection of industrial products

2. Metals. Experience was provided in:
   a. Measuring
   b. Layout, cutting, drilling, boring, and reaming holes
   c. Developing a degree of skill in bending, twisting, shaping, and forming
   d. Purchasing metal sheets and angles

3. Ceramics. No experiences were reported.

4. Construction. Provisions were made for:
   a. Housewiring
   b. Household appliances

5. Power and Transportation. No experiences were provided.
Methods and Devices. These were: (1) evaluation of learning activities; (2) plans of suggested projects; (3) materials suggesting projects; (4) specific objectives in writing; (5) plans for each day's work; (6) evaluation of manipulative activities; (7) test to reveal strengths and weaknesses; (8) assignment, job, operation, and information sheets; (9) exhibit materials; (10) record of progress; (11) accessible planning materials; (12) audio-visual aids; (13) consumer literature; (14) interpretation of test results for planning further instruction; (15) a laboratory library; and (16) standardized tests.

Physical Setting. These facilities were: (1) site adjacent to a principal corridor; (2) two exit doors opening outward; (3) ceiling height of 12 feet; (4) temperature of at least 68 degrees Fahrenheit; (5) storage space for tools; (6) machinery painted in colors chosen to minimize eye fatigue and promote safety; (7) appropriate hand tools; (8) instructor could observe tool rooms and racks easily; (9) building, one story high; (10) facilities for books, magazines, and other reference materials; (11) appropriate machines; (12) aisles 4 feet wide; (13) high visibility colors on control levers and switch boxes; (14) work benches selected for convenience and safety; (15) lighting at least 15 foot candles at working height; (16) first aid supplies; (17) instructor's office providing a clear view of all activities being carried on in the laboratory; (18) ceilings painted off-white with light colored walls and trim; (19) space for assembling projects; (20) floor covered
with material to insure safety; (21) covered metal containers provided for waste and scrap; (22) a small classroom; (23) finishing area; (24) lockers for personal belongings; (25) planning space for students; and (26) audio-visual materials.

**Organization and Administration.** This school provided: (1) salaries of industrial arts teachers equivalent to those in other subject matter areas; (2) a teacher possessing skill in using and demonstrating industrial tools, machines, and processes; (3) teacher preparation in health and safety; (4) teacher preparation in laboratory courses and in a variety of areas; (5) safety and economy; (6) preparation in the history and philosophy of industrial arts; (7) students paying for materials used in projects taken home; (8) maintainence of an accident record; (9) familiarity with current industrial arts publications; (10) qualification of a bachelor's degree; (11) work experience in industry; (12) participation in one or more industrial arts associations or societies; (13) evaluation as a continuous process; (14) a system of records used for accounting of equipment, materials and supplies; (15) activities publicized through school newspapers, public press, exhibits and chapel programs; (16) proper relationships maintained with teachers, students, industry and patrons; (17) minimum standards for selection of industrial arts personnel; (18) industrial arts courses available to all boys in grades 9 through 12; (19) teacher student ratio of 1:24; (20) annual budget which provided for new equipment,
instructional materials, supplies, maintenance, repairs, and replacements; and (21) inservice training as a part of the industrial arts programs.

**Recommendations**

The following recommendations are presented:

**Objectives.** That the objectives agreed on form the basic principles for implementing this program.

**Offerings.** That the course offerings be expanded to include experiences in electricity with other areas added later.

**Curriculum.** That (1) the program be extended to include handicraft and atypical cases; (2) ceramic experiences be provided; (3) metals include experiences for measuring with a rule, calipers, micrometers, and protractor, as well as experiences in bending, shaping, and forming metal; (4) plumbing experiences be provided in servicing plumbing fixtures; and (5) experiences in power and transportation be included and provided for disassembly, servicing and cleaning on such jobs as bicycles, automobiles, marine rigs, and the like.

**Methods and Devices.** That (1) students be allowed to participate in evaluation, and (2) occupational monographs be provided for the students as reference materials in their study of job requirements.

**Physical Setting.** That (1) equipment be selected with the age level of the children in mind; (2) fire extinguishers be made
available; (3) storage space be provided for supplies as well as for student projects; (4) machines be adequately mounted to prevent vibration and reduce noise; (5) a laboratory be provided that will allow for a width to length ratio of 1:2; (6) danger zones be painted around machinery and adequately guarded; (7) the shop be designed to provide for at least 75 sq. ft. of floor space per student; (8) gas, electric, water outlets, and compressed air be provided; (9) a 5' 0" dado be included in the planning of the new laboratory; and (10) partitions be utilized to provide for flexibility in converting the laboratories into one, two, or three areas and to provide for future space arrangements.

Organization and Administration. That (1) professional services be provided for improvement through a supervised program, (2) the laboratory be remodeled or a comprehensive type built; (3) opportunity be provided for increased specialization; (4) local supervision be provided for industrial arts; (5) industrial arts courses be made available to girls on an elective basis; (6) periods for industrial arts be at least two 45-minute periods or 90 minutes per class daily; and (7) teaching load be limited to 4 classes per week.

SCHOOL NO. 2

Findings

Enrollment. There were 39 boys in the ninth grade industrial arts classes, 19 in the tenth grade, and 11 in the twelfth grade.
These 79 students comprised approximately 45 percent of the total school enrollment of 184 students in the secondary grades. There were no girls enrolled in industrial arts classes.

Objectives. This program purports to: (1) encourage creative expression, (2) provide information about basic processes of industry, (3) orient the student in American industry, (4) aid in developing desirable social relationships, (5) provide recreational activities, and (6) increase consumer knowledges. Emphasis was not placed on (1) appreciation of good craftsmanship or (2) a reasonable variety of industrial processes.

Offerings. Provisions were found for: (1) mechanical drawing, and (2) woodworking.

1. General
   a. Working drawings were made for use in the laboratory
   b. Class discussions concerning jobs
   c. Dimensional sketches of items to be constructed in the school laboratory
   d. Experiences were provided in design
   e. Industrial products were studied


3. Ceramics. None.


5. Power and Transportation. None.

Methods and Devices. These were: (1) evaluation as an integral part of the learning activities; (2) plans of projects were available; (3) materials suggesting projects were available; (4) specific objectives were in writing; (5) manipulative activities
were evaluated in terms of number, quality and performance; (6) tests were used that revealed strengths and weaknesses; (7) assignment, job, operation, and information sheets were available; (8) displays and exhibit materials were used; (9) planning materials were accessible; (10) audio-visual aids were employed; (11) test results were used in planning further instruction, and (12) students participated in further instruction.

**Physical Setting.** It was found that: (1) the laboratory was adjacent to or connected to a principal corridor; (2) the heating system maintained at least 68 degrees temperature; (3) storage space was provided for tools; (4) equipment was selected with the age level of the children in mind; (5) machinery and equipment were painted in colors to promote safety; (6) shelves and cabinets were provided for books, magazines, and other reference materials; (7) fire extinguishers were available; (8) first aid supplies were available; (9) ceilings were painted an off-white with colored walls and trim; (10) space was provided for assembling projects; (11) laboratory area was rectangular in shape with a width to length ratio of 1:2; and (12) gas, electric, and water outlets were adequate.

**Organization and Administration.** Investigation established that: (1) salary of the industrial arts teacher was equivalent to that of teachers in other subject matter areas; (2) the teacher possessed skill in using and demonstrating industrial tools, machines, and processes; (3) that he possessed good health and character;
(4) he had preparation in first aid and safety; (5) he practiced
safety and economy; (6) he had preparation in laboratory courses and
in a variety of areas; (7) he had preparation in the history and
philosophy of industrial arts; (8) students paid for the materials
in projects which were taken home; (9) an accident record was main­tained; (10) the instructor read current industrial arts publica­tions; (11) he held a bachelor's degree; (12) he had worked in
industry; (13) he had participated in one or more industrial arts
associations; (14) records were used for the accounting of equipment,
materials, and supplies; (15) activities were publicized through the
school newspaper, public press, radio, television, exhibits, dis­plays, fairs, chapel programs and the like; (16) there were minimum
standards for selection of industrial arts personnel; (17) indus­trial arts activities were available to all boys in grades 9 through
12; (18) increased specialization in industrial arts was provided
for according to student maturity; (19) inservice training is a part
of the industrial arts program, and (20) teacher-student ratio is
within the standard of 1:200.

**Recommendations**

The following recommendations are made in the light of the
findings of the investigation and the national standards:

**Enrollment.** That girls be allowed to choose industrial arts
courses on an elective basis in grades 9 through 12.
Objectives. That (1) increased appreciation for good crafts­
manship, and (2) developing a degree of skill, become objectives
in directing the learning activities of industrial arts courses.

Offerings. That these be extended to include at least metals,
electricity, and construction courses.

1. General
   a. Illustrations
   b. Personnel organization
   c. Home workshop and out-of-school activities
   d. Handicraft activities
   e. Atypical cases such as blind, hard of hearing, ... 

2. Metals
   a. Use of rules, calipers, micrometers, and protractors
   b. Layout cutting, drilling, boring and reaming holes
   c. Bending, twisting, shaping, and forming metals
   d. Purchasing metal sheets and angles

3. Construction
   a. House wiring
   b. Radio and television
   c. Cooking utensils
   d. Household appliances
   e. Masonry, plumbing, and concrete work

Methods and Devices. That (1) consumer literature such as
buyers' guides, periodicals and industrial pamphlets be made avail­
able; (2) occupational monographs be made available, and (3)
standardized objective tests be employed in the program.

Physical Setting. That a new industrial arts laboratory be
constructed to meet the national standards in respect to site,
location, architectural design, and educational function.
Organization and Administration. That (1) professional services be available to the industrial arts program through local and state consultants, also to the teacher education program; (2) more students enroll in industrial arts courses to raise the teacher-student ratio to at least 1:20; (3) local coordination be achieved; (4) industrial arts courses be available to all girls on an elective basis, and (5) the teaching load of the industrial arts teacher be reduced to a maximum of 4 classes per week.

SCHOOL NO. 5

Findings

Enrollment. Eighteen eleventh grade boys and 15 twelfth grade boys were reported in industrial arts classes. This was only 9 percent of the total school enrollment of 368. No girls were enrolled.

Objectives. All eight objectives were in agreement with their philosophy as follows: (1) encourage creative expression, (2) provide information about basic processes of many industries, (3) orient the student to American industry, (4) aid in developing desirable social relationships, (5) provide recreational activities, (6) increase consumer knowledges, (7) develop an appreciation of good craftsmanship, and (8) develop a degree of skill in a variety of basic industrial processes.
Offerings. Provisions were made for (1) mechanical drawing, (2) woodworking, (3) cabinetmaking, and (4) masonry.

1. General

   a. Made working drawings
   b. Discussed working conditions
   c. Made dimensional sketches
   d. Personnel organization
   e. Designing in wood and masonry
   f. Health and safety
   g. Studied industrial products


3. Ceramics. None.

4. Construction. This included:

   a. Projects involving masonry
   b. Servicing plumbing fixtures

5. Power and Transportation. None.

Methods and Devices. The following were found: (1) evaluation of learning activities; (2) plans of suggested projects; (3) manipulative activities evaluated as to number, quality, and performance; (5) tests to reveal strengths and weaknesses; (6) comparisons between the products of industry; (7) records of individual progress for guidance purposes; (8) audio-visual aids; (9) periodicals and industrial pamphlets available; (10) use of test results in planning further instruction; (11) use of standardized objective tests, and (12) occupational monographs available.

Physical Setting. The investigation found that: (1) the site was adjacent to a principal corridor; (2) it had two exit doors opening outward, one of which was larger than the largest piece of
equipment; (3) temperature in the laboratory was maintained at 68 degrees; (4) storage space was available; (5) machinery and equipment were painted in colors that promoted safety; (6) appropriate hand tools were provided; (7) tool rooms were easily observed by the instructor; (8) shelves were provided for books, magazines, and other reference materials; (9) aisles were 4 feet wide; (10) high visibility colors were used on control levers and switch boxes; (11) lighting was about 15 foot candles at working height; (12) fire extinguishers were available; (13) first aid supplies were available; (14) the office was located so that the instructor could observe all activities being carried on in the laboratory; (15) ventilation insured healthful working conditions; (16) space was provided for assembling projects; (17) floor was covered with material to insure safety; (18) open laboratory was rectangular in shape with a width to length ratio of 1:2; (19) waste and scrap were disposed of in covered metal containers; (20) a suitable finishing area was provided; (21) space was provided for students to plan their work; (22) 60 sq. ft. per student was provided; (23) electricity and water were adequate; (24) washing facilities were supplied with hot and cold water; and (25) provisions were made for darkening the rooms.

Organization and Administration. This included: (1) industrial arts teacher salary equivalent to those of other teachers;
(2) he possessed good health and character; (3) he had preparation in laboratory courses and in a variety of areas; (4) he practiced safety and economy; (5) he was prepared in the history and philosophy of industrial arts; (6) students paid for materials in projects carried home; (7) the teacher read current industrial arts publications; (8) he held a bachelor's degree; (9) he had work experience in industry; (10) he participated in one or more industrial arts associations or societies; (11) evaluation was a continuous process; (12) professional services were rendered the industrial arts program; (13) a system of records was used for accounting of equipment, materials and supplies; (14) activities were publicized through school newspaper, exhibits, displays, fairs, and chapel programs; (15) minimum standards for the selection of industrial arts personnel; (16) courses available to all boys in grades 9 through 12, (17) a teaching load of 1:16, well below the national minimum of 1:24; (18) opportunity was provided for increased specialization in industrial arts according to student maturity, (19) an annual budget was approved for new equipment, instructional materials, supplies, maintenance, repairs, and replacements; (20) inservice training was a part of the industrial arts program; (21) teacher-student ratio was 1:368, which is above the maximum of 1:200; (22) periods for industrial arts were at least 90 minutes; and (23) the industrial arts teacher had a maximum of 4 classes per week.
**Recommendations**

The following recommendations are made for this school:

**Enrollment.** That girls be encouraged to pursue courses in industrial arts.

**Objectives.** That the eight objectives serve as principles for stimulating the industrial arts program.

**Offerings.** That industrial arts be extended to include metals, electricity, and power and transportation as follows:

1. General
   a. Handicraft activities
   b. Atypical cases

2. Metals
   a. Measuring with calipers, rule, micrometer, and protractor
   b. Developing a degree of skill in bending, twisting, shaping, and forming metal
   c. Purchasing metal sheets and angles

3. Ceramics
   a. Shaping, casting, and throwing
   b. Making plaster casts
   c. Employing decoration in paint and slip making

4. Power and Transportation
   a. Disassembling and servicing essential parts
   b. Working with bicycles, marine transportation, automobiles, aeronautics, railroads, and outboard motors

**Methods and Devices.** That instructional techniques and instruments include: (1) materials suggesting projects, (2) plans for each day's work, (3) drawing textbooks and planning materials,
(4) trade journals, and (5) a laboratory library.

**Physical Setting.** That housing facilities provide for: (1) ceiling to be painted an off-white with light colored walls, (2) lockers for storage of personal belongings, and (3) dado of 60 inches.

**Organization and Administration.** That provision be made to: (1) maintain an accident record; (2) maintain better public relations through the press, radio, open house, and special projects; (3) encourage more boys to pursue courses in industrial arts, especially in grades 7, 8, 9, and 10; (4) incorporate local coordination of effort; and (5) make industrial arts courses available to girls on an elective basis.

**SCHOOL NO. 19**

**Findings**

**Enrollment.** Two hundred boys were enrolled in the eighth, 100 in the ninth, and 50 in the tenth grade industrial arts classes. This was approximately 30 percent of the total school enrollment of 1150 students. No girls were enrolled in these classes.

**Objectives.** This program agreed to: (1) encourage creative expression, (2) provide information about basic processes of industry, (3) orient the student to American industry, (4) increase an appreciation for good craftsmanship, (5) develop desirable social relationships, (6) develop recreational activities, (7) increase consumer knowledge, and (8) develop a degree of skill in a variety of basic industrial processes.
Offerings. These were reported to consist of: (1) mechanical drawing, (2) woodworking, (3) cabinetmaking, (4) carpentry, and (5) metals.

1. General
   a. Working drawings
   b. Illustrations and diagrams
   c. Class discussions of working conditions
   d. Dimensional sketches of items to be constructed
   e. A personnel organization
   f. Designing experiences
   g. Out-of-school activities are encouraged
   h. Provisions are made for special cases

2. Metals
   a. Measuring with a rule, calipers, micrometers, and protractor
   b. Bending, twisting, shaping, and forming metal
   c. Purchasing metal sheets, and angles

3. Ceramics. None.

4. Construction. Provisions for:
   a. Housewiring, and household appliances
   b. Plumbing, and servicing of plumbing fixtures
   c. Forms built of concrete

5. Power and Transportation. None.

Methods and Devices. This program employed: (1) evaluation as an integral part of the learning activities; (2) plans for suggested projects; (3) materials for suggested projects; (4) specific objectives in writing; (5) plans for each day's work; (6) manipulative activities evaluated in terms of number, quality, and performance; (7) tests for revealing strengths and weaknesses; (8) assignment, operation and information sheets; (9) display and exhibit
materials; (10) comparisons between the products of industry; (11) records of individual progress for guidance purposes; (12) buyers' guides, periodicals, and industrial pamphlets; (13) trade journals; (14) a laboratory library provided with a variety of textbooks and reference materials; (15) standardized tests; and (16) occupational monographs.

Physical Setting. This aspect showed that: (1) the laboratory had at least two exit doors (opening outward), one of which was larger than the largest piece of equipment or instructional project to be moved in or out of the laboratory; (2) ceiling was 12 feet in height; (3) heating system maintained a temperature of at least 68 degrees; (4) adequate facilities were provided for tools and equipment; (5) equipment was selected with the age level in mind; (6) machines and equipment were painted in colors promoting safety; (7) appropriate hand tools were provided; (8) aisles at least 4 feet wide were provided for student traffic; (9) high visibility colors were used on control levers and switch boxes; (10) work benches were selected for convenience and safety; (11) lighting was up to about 15 foot candles at working height; (12) fire extinguishers were available; (13) first aid supplies were available; (14) machines were adequately mounted to prevent vibration; (15) office of instructor was located in such a way as to provide him with clear view of all activities being carried on in the laboratory; (16) machines around which danger zones existed were adequately guarded; (17) a small
classroom was available and equipped with a teacher's desk, (18) lockers were provided for the storage of personal belongings, and (19) the dado was 60 inches.

Organization and Administration. These aspects were reported: (1) salary of the industrial arts teacher was equivalent to those of other teachers; (2) teacher possessed skill in using and demonstrating industrial tools, machines and processes; (3) he had preparation in first aid and safety; (5) he practiced safety and economy; (6) he had preparation in the history and philosophy of industrial arts; (7) students paid for the materials in the projects they took home; (8) an accident record was maintained; (9) the teacher read current industrial arts publications; (10) he held a bachelor's degree; (11) he had work experience in industry; (12) he participated in one or more industrial arts associations or societies; (13) evaluation was a continuous process; (14) professional services were rendered the industrial arts program; (15) a system of records was used for accounting of equipment, materials, and supplies; (16) activities were publicized through the school newspaper, exhibits, displays, chapel programs, and the like; (17) healthy relationships were promoted with students, parents, industry, and patrons; (18) public relations were maintained through curriculum activities, open house, and special programs; (19) there were minimum standards for selection of industrial arts personnel; (20) industrial arts activities were available to all boys grades.
9 through 12; (21) maximum teacher ratio did not exceed the recommended ratio of 1:24, and (22) opportunity was provided for increased specialization in industrial arts according to student maturity.

**Recommendations**

**Enrollment.** There was need for (1) more boys to be encouraged to pursue industrial arts courses, and (2) girls to be provided with experiences in industrial arts.

**Objectives.** More emphasis should be placed on using the objectives of the program as guides for directing and improving it.

**Offerings.** The program should be extended to include electricity, and transportation and power, as follows:

1. General
   a. Handicraft activities
   b. Behavior students and adults

2. Metals
   a. Measuring with rule, calipers, micrometers, and protractor
   b. Layout, cutting, drilling, boring, and reaming holes
   c. Purchasing metal sheets, and angles

3. Ceramics
   a. Shaping, casting, and throwing experiences as in pottery making
   b. Making plaster casts
   c. Decoration employed in painted and slip tracing, inlaid decoration, and glazing

4. Construction
   a. Housewiring, and household appliances
   b. Projects involving masonry materials, tools, equipment and supplies
   c. Plumbing and servicing of plumbing fixtures
   d. Building forms and pouring concrete
5. Power and Transportation

a. Disassembling, servicing, and cleaning parts
b. Work with bicycles, marine transportation, automobiles, aeronautics, railroads, and outboard motors

Methods and Devices. There is a need for: (1) a variety of audio-visual aids, (2) use of test results for planning future instruction, and (3) student participation in evaluation.

Physical Setting. There is a need for: (1) constructing a laboratory adjacent to or connected with a principal corridor; (2) adequate shelves, filing cabinets, or similar facilities for books, magazines, and other reference materials; (3) sufficient storage space and facilities for supplies and student projects; (4) ceilings painted an off-white with light colored walls and trim; (5) adequate ventilation and forced air exhaust fumes and vapors; (6) space for assembling projects; (7) acoustical treatment for a sound absorption coefficient of 60; (8) floors covered with material to insure safety; (9) laboratory designed with a ratio of 1:2; (10) provide a classroom of at least 20' x 30'; (11) a suitable finishing area; (12) lockers installed for storage of personal belongings; (13) space for students to plan their projects and conduct conference sessions; (14) provide at least 75 sq. ft. per student; (15) adequate outlets for gas, electricity, water, and compressed air; (16) washing facilities with hot and cold water; and (16) provisions for darkening rooms.
Organization and Administration. The investigation revealed the following needs: (1) industrial arts should be made available to all boys grades 9 through 12; (2) the laboratory should be comprehensively designed; (3) mature students should be allowed to specialize; (4) inservice training should be initiated in the industrial arts program; (5) courses should provide for girls; (6) periods should be two 45-minute periods per day or 450 minutes per week; and (7) one industrial arts teacher should have a maximum of 4 classes per week.

SCHOOL NO. 20

Findings

Enrollment. No girls were enrolled in industrial arts. Eight boys were in the seventh, 36 in the ninth, 21 in the tenth, 12 in the eleventh, and 9 in the twelfth grade, making a total enrollment of 86. This was only 6 percent of the total school enrollment of 1268, or considerably less than a fourth of what it should have been.

Objectives. This program agreed these should be: (1) to encourage creative expression, (2) to provide information about the basic processes of many industries, (3) to orient the student to American industry, (4) to develop desirable social relationships, (5) to increase an appreciation for good craftsmanship, (6) to develop recreational activities, (7) to increase consumer knowledge, and (8) to develop a degree of skill in a variety of basic industrial processes.
Offerings. This program included the following: (1) mechanical drawing, (2) woodworking, (3) cabinetmaking, (4) upholstery, (5) carpentry, and (6) auto mechanics.

1. General
   a. Made working drawings
   b. Studied illustrations and design
   c. Discussed working conditions
   d. Made dimensional sketches
   e. A personnel organization
   f. Health and safety
   g. Study of industrial products


3. Ceramics. None.

4. Construction
   a. Housewiring and household appliances
   b. Projects were made for layout, cutting, drilling, boring, and reaming holes
   c. Built forms and poured concrete

5. Power and Transportation
   a. Disassembled, serviced, and cleaned essential parts of automobile
   b. Worked with automobiles

Methods and Devices. These were reported: (1) evaluation as an integral part of learning; (2) plans of suggested projects; (3) materials suggesting projects and manipulative activities; (4) general and specific objectives in writing; (5) plans for each day's work; (6) manipulative activities evaluated in terms of number, quality, and performance; (7) teacher and students realized that tests should be used to reveal strengths and weaknesses; (8) assignment, job, operation, and operation sheets; (9) individual
progress was recorded and used for guidance purposes; (10) comparisons were made between the products of industry; (11) drawing textbooks and planning materials; (12) a variety of audio-visual aids such as films, filmstrips, chalkboard, and bulletin board; (13) buyers' guides, periodicals, and industrial pamphlets; (14) test results were used in planning further instruction; (15) students participated in evaluation; (16) a laboratory library was provided with a variety of textbooks and reference materials; (17) standardized tests were used; and (18) also occupation monographs.

**Physical Setting.** These were found: (1) laboratory site located adjacent to or connected with a principal corridor, and near a driveway accessible to automobile and trucks; (2) laboratory with two exit doors opening outward, one of which was larger than the largest piece of equipment or instructional project to be moved in or out of the laboratory; (3) laboratory ceiling 12 feet in height; (4) heating system maintained comfortable and healthful conditions at all times (68 degrees); (5) a storage space provided for tools; (6) equipment selected with age level in mind; (7) appropriate hand tools; (8) machinery and equipment were painted in colors that would promote safety and minimize eye fatigue; (9) tool racks designed so the instructor could observe them easily; (10) laboratory building one story in height; (11) shelves for books, magazines, and other reference materials; (12) appropriate machines; (13) aisles at least 4 feet wide; (14) high visibility colors on levers and switch
boxes; (15) lighting was at least 15 foot candles at working height; (16) fire extinguishers; (17) first aid supplies; (18) storage space for projects and supplies; (19) machines mounted to prevent vibration; (20) office located so all laboratory activities could be easily viewed; (21) ceiling painted an off-white; (22) ventilation adequate to insure healthful working conditions; (23) space provided for assembling projects; (24) floor made to insure safety; (25) open laboratory area rectangular in shape with a width to length ratio of 1:2; (26) waste and scrap disposed of in covered metal containers; (27) a classroom available and equipped with a teacher's desk; (28) lockers provided for the storage of personal belongings, and located in such a way that they could be supervised by the instructor; (29) space provided for students to plan their projects; (30) an average of at least 75 sq. ft. of floor space per student; (31) electrical and water outlets; (32) washing facilities; and (33) provisions for darkening the room.

**Organization and Administration.** It was found that: (1) the salary of the industrial arts teacher was equivalent to those of other teachers; (2) industrial arts teacher possessed skill in using and demonstrating industrial tools, machines, and processes; (3) he possessed good health and character; (4) he had preparation in laboratory courses in a variety of areas; (5) he practiced safety and economy; (6) he had preparation in history and philosophy of industrial arts; (7) students paid for the projects they took home;
an accident record was maintained; (9) the teacher read current industrial arts publications; (10) he held a bachelor's degree; (11) he had work experience in industry; (12) he participated in one or more industrial arts associations or societies; (13) professional services were rendered the industrial arts program; (14) records were used for accounting of equipment, materials, and supplies; (15) industrial arts program activities were publicized through the school newspaper, exhibits, and chapel programs; (16) there were minimum standards for the selection of industrial arts personnel; (17) industrial arts activities were available to all boys in grades 9 through 12; (18) teacher-student ratio was below the maximum of 1:24; (19) opportunity was provided for increased specialization in industrial arts according to student maturity; and (20) the industrial arts teacher had a maximum of 4 classes per week.

**Recommendations**

**Enrollment.** There is need for: (1) the program to encourage and recruit more boys, and (2) for girls to enroll in industrial arts courses.

**Objectives.** The eight principles agreed upon should serve as guides in improving facilities and instructional services.

**Offerings.** It is recommended that: (1) general metals be added to the courses, and (2) electricity become an extension of
the courses as follows:

1. General
   a. Designing experiences in wood
   b. Home workshop and out-of-school activities
   c. Handicraft activities
   d. Special consideration and arrangements made for special students

2. Metals
   a. Experiences for measuring with a rule, calipers, micrometers, and protractor
   b. Provisions for layout, cutting, drilling, boring, and reaming holes
   c. Experiences for purchasing metal sheets and angles

3. Ceramics
   a. Experiences provided for shaping, casting, and throwing
   b. Making plaster casts
   c. Decoration as employed in painted and slip tracing, inlaid decoration, and glazing

4. Construction
   a. Plumbing, heating, refrigeration, and servicing of plumbing fixtures

5. Power and Transportation
   a. Experiences in disassembling, servicing, and cleaning essential parts
   b. Working with bicycles, marine transportation, and aeronautics

Methods and Devices. A need was indicated in this program for:
(1) use of industrial displays and exhibit materials, and (2) evaluation of usage and quality of handicraft activities when added.

Physical Setting. The report indicated the need for: (1) a dado of 60 inches, and (2) the present laboratory being maintained in its present good condition.
Organization and Administration. There was need for: (1) industrial arts courses for girls on an elective basis, and (2) employment of at least two industrial arts teachers, with four desirable for a school with an enrollment of more than 1200, such as this one.

SCHOOL NO. 32

Findings

Enrollment. Thirty-nine boys were enrolled in industrial arts in the seventh grade, 50 in the eighth, 50 in the ninth, 10 in the tenth, 10 in the eleventh, and 10 in the twelfth. The total enrollment of 169 in industrial arts was only 17 percent of the total school enrollment of 1000, or less than half of the trend.

Objectives. The program was in agreement with these objectives: (1) to encourage creative expression, (2) to provide information about the basic processes of many industries, (3) to orient the student to American industry, (4) to increase an appreciation for good craftsmanship, (5) to develop desirable social relationships, (6) to develop recreational activities, (7) to increase consumer knowledge, and (8) to develop a degree of skill.

Offerings. These consisted of the following: (1) mechanical drawing, (2) woodworking, (3) cabinetmaking, (4) carpentry, (5) sheet metal, (6) electricity, and (7) machine shop.
1. General. Experiences were provided in:

a. Working drawings
b. Illustration and design
c. Discussion of working conditions
d. Dimensional sketches of items to be constructed
e. Home workshop and out-of-school activities
f. Health and safety
g. Study and selection of industrial products as to workers, types of jobs, opportunities, wages, and working hours
h. Representative area experiences provided for behavior students

2. Metals. Experiences were provided in:

a. Measuring with a rule, calipers, micrometers, and protractor
b. Layout, cutting, drilling, boring and reaming holes
c. Developing skills in bending, twisting, shaping, and forming metal
d. Purchasing metal sheets, and angles

3. Ceramics. None.

4. Construction. Experiences were provided for:

a. Housewiring and household appliances
b. Projects involving masonry materials, tools, equipment, and supplies
c. Plumbing, and servicing plumbing fixtures
d. Building forms, and pouring concrete

5. Power and Transportation. Provisions were made for:

a. Disassembling, servicing and cleaning essential parts
b. Working with bicycles, automobiles, aeronautics, and outboard motors

Methods and Devices. The following items were reported favorably: (1) evaluation as an integral part of learning; (2) plans of suggested projects; (3) materials suggesting projects and manipulative activities; (4) tests used to reveal strengths and weaknesses;
(5) plans for each day's work; (6) manipulative activities evaluated in terms of number, quality, and performance; (7) the instructor had general and specific objectives in writing for each learning unit; (8) teacher-prepared materials such as assignment, job, operation, and information sheets; (9) industrial displays and exhibit materials; (10) studies were made between the products of industry; (11) handicraft activities; (12) individual progress was recorded and used for guidance purposes; (13) drawing textbooks and planning materials were accessible; (14) a variety of audio-visual aids such as films, film-strips, chalkboard, bulletin board, mock-ups, models, and the like were employed; (15) buyers' guides, periodicals, and industrial pamphlets were used; (16) test results were used in planning instruction; (17) students participated in their own evaluation; (18) trade journals were available; (19) a laboratory library was provided, with a variety of textbooks and reference materials; and (20) occupational monographs were used.

Physical Setting. The following items were present: (1) the laboratory site was adjacent to the principal corridor; (2) the laboratory had at least two exit doors opening outward; (3) ceiling height was the minimum of 12 feet; (4) heating system maintained a temperature of 68 degrees; (5) storage space was provided for tools and metal equipment; (6) equipment was selected with the age level in mind; (7) machinery and equipment were painted in colors that promote safety and minimize eye fatigue; (8) appropriate hand tools
were provided; (9) the instructor could observe the tool room; (10) the laboratory building was one story in height; (11) shelves were provided for books, magazines, and other reference materials; (12) appropriate machines were provided; (13) aisles at least 4 feet wide were provided for student traffic; (14) high visibility colors were used on control levers and switch boxes; (15) work benches were selected for convenience and safety; (16) lighting was at least 15 foot candles at bench height; (17) fire extinguishers were available; (18) first aid supplies were available; (19) storage space was provided for supplies as well as for student projects; (20) machines were adequately mounted to prevent vibration and reduce noise; (21) the office of the instructor provided a clear view of all activities in the laboratory; (22) ceilings were painted an off-white with light colored walls and trim; (23) ventilation provided for healthful working conditions; (24) space was provided for assembling projects in their respective areas; (25) space assigned for industrial arts was so located as not to inconvenience other learning activities; (26) the floor was made of material to insure safety; (27) the laboratory area had a width to length ratio of 1:2; (28) a suitable finishing area was provided; (29) waste and scrap were disposed of in covered metal containers; (30) lockers were provided for the storage of personal belongings; (31) space was provided for students to plan their projects; (32) an average of at least 60 sq. ft. per student was maintained; (33) electric and water outlets were available;
(34) washing facilities were available; (35) the dado was 60 inches; and (36) provisions were made for darkening the room.

Organization and Administration. These aspects were reported: (1) the salary of the industrial arts teacher was equivalent to those in other subject matter areas; (2) the teacher possessed skill in using and demonstrating industrial tools, machines, and processes; (3) he possessed good health and character; (4) he had preparation in first aid and safety; (5) he had preparation in a variety of laboratory areas; (6) he practiced safety and economy; (7) he had preparation in the history and philosophy of industrial arts; (9) an accident record was maintained; (10) the teacher read current industrial arts publications; (11) he held a bachelor's degree; (12) he has had work experiences; (13) he had participated in one or more industrial arts associations or societies; (14) evaluation was a continuous process; (15) professional services were rendered; (16) a system of records was used for the accounting of equipment, materials, and supplies; (17) activities of the industrial arts program were publicized through the school newspaper, exhibits, displays and chapel programs; (18) wise relationships were maintained with students, teachers, parents, industry, and patrons; (19) minimum standards were employed in the selection of industrial arts personnel; (20) industrial arts courses were available to all boys in grades 9 through 12; (21) the industrial arts laboratory was a comprehensive type; (22) maximum teacher-student ratio did not
exceed 1:24; (23) opportunity was provided for increased special-
ization in industrial arts according to student maturity; (24) an
annual budget was approved for new equipment, instructional materials,
supplies, maintenance, repairs, and replacements; (25) inservice
training was a part of the industrial arts program; (26) industrial
arts teacher-student body ratio was within 1:200; (27) there was
local coordination of effort; (28) periods for industrial arts were
two 45-minute periods per class day; and (29) one industrial arts
teacher had a maximum of 4 classes per week.

Recommendations

The following recommendations are made for this school:

Enrollment. That more boys be encouraged to enroll in indus-
trial arts courses, and provisions be made for girls to pursue
industrial arts courses on an elective basis.

Objectives. That this program fully meet these goals.

Offerings. That experiences in masonry be incorporated. That
this program continue to provide the experiences in such areas as
metals, construction, and power and transportation.

Methods and Devices. The instructor should continue to supply
new reference materials such as textbooks, manuals, monographs,
brochures, and pamphlets. He should continue to purchase and con-
struct devices such as models, mock-ups, exhibits, and displays.
Physical Setting. This program should be developed as a guide in planning future programs in industrial arts throughout the State of North Carolina.

Organization and Administration. That industrial arts classes for girls be scheduled on an elective basis from grades 7 through 12.

Chapter IX presents a general summary of the patterns of the findings and recommendations for industrial programs in 36 public secondary schools for Negroes of North Carolina.
Chapter IX

PROJECTION OF THE PROGRAM IN NORTH CAROLINA

Chapter III pointed out that North Carolina is moving from an agrarian to an industrial economy. Chapter IV showed that the Negro citizen is a part of the migration from rural to urban areas. His economic status is low and is directly correlated with his occupational status. His educational level is low and due in part to the fact that he is employed predominantly in unskilled, semi-skilled, or domestic service occupations. The narrow curriculum offerings of mathematics, social science, English, science, and foreign languages is not meeting his needs, hence the attrition. He is the victim of circumstances and in a technological environment, destined to gravitate to an unfortunately low social status.

Chapter V showed that industrial arts has a functional part to play in the education of all individuals. This program should be a part of the general education of all youth. Industrial arts can go far in implementing the needs of youth, thus enabling them to adjust better to their industrial environment and to live happy lives. Chapter VII showed that industrial arts programs in public secondary schools for Negroes of North Carolina were inadequate. Thus, the need for the projection of a program for North Carolina as presented in this chapter. The following are recommended as a guide to action for the improvement of existing programs and the
development of new ones in the future: Philosophy, Curriculum, Methods and Devices, Physical Setting, and Organization and Administration:

PHILOSOPHY

The guiding principles for industrial arts programs on the secondary school level show their place in the total school program and how they may reflect on the life of every student in the school. Therefore these objectives are recommended:

1. To orient the student to American industry in terms of its origins, organization, materials, processes, operations, products, and occupations.

2. To encourage creative expression in the use of industrial materials.

3. To develop recreational activities appropriate to industrial arts or technology.

4. To increase consumer knowledge to a point where students can select, buy, use, and maintain the products of industry intelligently.

5. To develop a degree of skill in a variety of basic industrial products.

6. To increase an appreciation for good craftsmanship and design in the products of modern industry and in the artifacts from the cultures of the past.

7. To develop desirable social relationships such as cooperation, discipline, and tact.
CURRICULUM

The industrial development of North Carolina is paralleling that of other states in the South Atlantic region. Construction has increased over 40 percent, manufacturing is on the upgrade, and communications are gradually moving into the pattern of economic life. North Carolina is strategically located and lends itself well to power and transportation units of instruction through land, sea, and air travel, also via water, solar, wind, and atomic power. The curriculum activities for industrial arts programs should be broad in scope and rich with information and experiences that will enlighten and lift the youth of the state.

Activities for boys and girls in the junior high school should be orientational in nature, while those for the senior high school may emphasize a particular aspect of industry in accordance with specialized interests, abilities, needs, and purposes. The following are presented as typical activities that may be introduced in a comprehensive laboratory of industries.

Drawing and Planning. Industrial arts drawing should be thought of as a subject of communication like reading and writing. It must have direct relation to the problems of living. The content of a unit on drawing has general application to the immediate needs and interests of boys and girls in school. It functions in the science, mathematics, and social studies classes, as well as in the every day life of students. All students should have an
opportunity to receive experiences in the following basic principles of drawing.

Woodworking. The fabrication of objects made of wood has long been a major industry in this country. Thousands of men and women are employed in this great industry. Everyone is a consumer of its products: furniture, homes, toys, and scores of other products. North Carolina is a leader in the manufacture of furniture fabricated of wood. It seems obvious that an introduction to woodworking is of value to all children and the following items from the AVA report (3) are suggestive of what should be included:

1. Designing
2. Planning
3. Layout
4. Workmanship
5. Using Cutting Tools
6. Hardware
7. Finishing
8. Upholstery
9. Occupational Information
10. Consumer Knowledge
11. Human Relations
12. Habitat of Native Woods
Metal Working. The metal working industry of today manufactures products of greater total dollar value and employs more persons than does any other division of industry. At least one out of every ten people works either directly or indirectly in the area of metal working. Great industries such as the automobile, aviation, shipbuilding, and home appliances are only a few of those using metal. Some basic manufacturing processes to be covered (see also reference 3) in a metal working program are:

1. Designing a Project
   a. Elements of design
   b. Qualities of metal that affect design
   c. Types of assembly that affect design
   d. Make and read working drawings

2. Planning and Production Control
   a. A bill of materials
   b. A plan of procedure

3. Measuring
   a. Divide spaces with a rule
   b. Inside calipers
   c. Outside calipers
   d. With micrometer
   e. With hermaphrodite calipers
   f. With protractor

4. Layout
   a. Make a layout on paper and transfer it to metal
   b. Make a simple layout on metal
   c. Make a template
   d. Develop a pattern
   e. Transfer a pattern

5. Cutting
   1. Hack saw, cold chisel, jeweler's saw, tin snips
   2. Jig saw
   3. Lathe, shaper, milling machine
   4. Acetylene torch
6. Drilling, Boring, Reaming, and Punching Holes
   a. Hand drill
   b. Drill press, lathe, milling machine
   c. Cutting torch
   d. Solid or hollow punch

7. Bending and Twisting
   a. Cold
   b. Heated
   c. Machined

8. Shaping and Forming
   a. By hand when cold
   b. By hand when heated
   c. Forming rolls, bar folder
   d. Lathe, shaper, milling machine
   e. Spinning
   f. Pouring molds

9. Heat Treating
   a. Annealing
   b. Hardening
   c. Tempering
   d. Case Hardening

10. Smoothing
    a. Files, scrapers, burnishers
    b. Grinding wheels
    c. Abrasive materials

11. Cutting Threads
    a. Taps and dies
    b. Chase and grind threads with machine tools

12. Assembling Metal Parts
    a. Rivets
    b. Screws
    c. Bolts and machine screws
    d. Seams
    e. Joints
    f. Soft soldering
    g. Hard soldering
    h. Brazing
    i. Spot welding
    j. Arc welding
    k. Acetylene welding
13. Decorating the Surface
   a. Etching
   b. Overlay
   c. Repousse
   d. Enameling
   e. Peening and planishing
   f. Chasing, dooming, fluting
   g. Spot finishing
   h. Design stamping

14. Finishing the Surface
   a. Polishing
   b. Paint, enamel, varnish, lacquer
   c. Spraying
   d. Coloring with heat
   e. Coloring with chemicals
   f. Plating
   g. Sand blasting
   h. Metalizing

15. Sources of Raw Materials
   a. Extraction
   b. Shipping

16. Refining
   a. Steel
   b. Aluminum
   c. Copper and its alloys
   d. Silver, lead and zinc, ....

17. Characteristics
   a. Comparison of color, working qualities, ....
   b. Properties of metals
   c. Common kinds and shapes

18. Consumer Uses of Metals
   a. Purchasing sheets, angles, shapes
   b. Pipe, rivets, screws, wire
   c. Use in home construction, utensils, appliances, commercial construction, transportation (automobiles, airplanes, ships, trains), jewelry and silverware

19. Occupational Information
   a. Fields
   b. Number and kinds of workers
   c. Types of jobs
d. Kinds of manufacturing concerns
  e. Opportunities
  f. Wages and working conditions

20. Tools and machines for home workshops, including home repair and hobby activities

**Ceramics**. The manufacture of useful articles from ceramic materials is one of the oldest industries known to man. Even today the ceramics industry, despite new and varied developments of other natural or synthetic materials, still holds an honorable position in the industrial world. Individuals of all ages are users of ceramic products in the form of toys, dishes, terra cotta ornaments, floor and building tile, pottery, brick, bathroom fixtures, and beautiful creations in ceramic sculpture, to mention only a few. An introduction to ceramics is thus in keeping with the larger objectives of industrial arts education. A well-balanced course should offer an appreciation of the nature of the ceramics industry and its employment possibilities, an appreciation of good ceramic design and appropriate finish, and an opportunity for the pupil to work with ceramic materials. The following suggestions are adapted from the AVA list (3):

1. Types of Experiences
   a. Preparation and care of materials
   b. Hand processes
   c. Production processes
   d. Decorating processes
   e. Composition and production of glazes
   f. Use of glazes
   g. Firing of wares, biscuit and glost
   h. Enameling on metal
   i. Fabrication of glass
   j. Care and maintenance of equipment
Electricity. Life today is scarcely conceivable without the applications of electricity, a twenty billion dollar industry, identified with the industrial growth of America. The production of electrical power from atomic energy at only a fraction of present costs indicates a tremendous expansion of the amount and kinds of uses for this greatest of man's servants. Irrespective of what the future may hold, the individual will be handicapped unless he is reasonably well informed concerning the many electrical applications in daily living. Thus, industrial arts can make a great contribution to the general education of all children in the area
of electricity. The following suggestions are adapted from the AVA list (3):

1. Basic Processes
   a. Insulating techniques
   b. Winding coils
   c. Wiring techniques
   d. Circuit analysis
   e. Repair of electrical equipment
   f. Fabrication of an electrical device showing application of electrical power
   g. Power installations
   h. Consumer knowledges
   i. Understanding industry
   j. Nature of electrical phenomena (general)
   k. Nature of electrical phenomena (electronic)
   l. Types of circuits
   m. Measuring devices
   n. Manufacture
   o. Industrial applications

See also the dissertation by William L. Deck, "A Resource Research in Electricity, for American Industrial Arts Education Programs with Implications for Teacher Education," The Ohio State University, Columbus, 1955.

Power and Transportation. The history of civilization and the story of transportation are closely linked. The merging of peoples and the exchange of ideas, tools, and goods over wide distances (in short, the education of man in commerce, mechanics, language, and thought), proceeded through, by, and directly on wheels. In addition to its historical significance, transportation can be a most important theme in the industrial arts program because of its immediate application to everyday living.
1. Experiences and Informational Topics
   a. Bicycle
   b. The outboard motor
   c. Marine transportation
   d. Automobiles
   e. Aeronautics
   f. Railroads

Construction. Home construction, upkeep and maintenance take on greater significance in an age of home ownership as well as technological expansion. For many people, the purchase of a home is perhaps their greatest single financial undertaking. It should be equally important that they know how to maintain their investment. The following headings have been adapted from the AVA list (3) of suggestions:

1. Manipulative Experiences in Construction
   a. Planning
   b. Carpentry
   c. Plumbing
   d. Finishing and decorating
   e. Masonry
   f. Heating and air conditioning
   g. Public works

2. Informational Topics
   a. Consumer knowledges
   b. Technical knowledges

These experiences should be presented in order to provide for the optimum development of each individual. Hence, the suggestions for presentation are listed in the following section on methods and devices.
METHODS AND DEVICES

The industrial arts teacher, like other teachers, has to have at his command skill in communicating ideas. The following is a list of those facilities (see also reference 3) that may be employed to expedite learning in the industrial arts program:

1. Objectives for each area
2. Plans for each day's work
3. A laboratory library
   a. Buyer's guides
   b. Periodicals
   c. Occupational monographs
   d. Textbooks
   e. Trade journals
   f. Materials suggesting projects
   g. Plans of suggested projects
4. Instruction sheets
5. Audio-visual aids
   a. Chalk board
   b. Bulletin board
   c. Films
   d. Film strips
   e. Opaque projection
   f. Cut-away
   g. Models
   h. Mock-ups
   i. Displays
   j. Exhibits
   k. Radio
   l. Television
   m. Samples
   n. Illustrations
6. Equipment
7. Tools
8. Materials
9. Supplies
10. Tests
11. Records
12. Discussions
The effectiveness of all teaching is conditioned by the setting in which the student operates. The following concerns those minimum factors that must be found in the physical setting of the industrial arts program.

PHYSICAL SETTING

A laboratory of industries should be designed to reflect technology. Certain basic principles in planning and designing must be used in order that the best possible results will be attained. Hence, the following points are recommended for industrial arts programs in public secondary schools for Negroes of North Carolina:

1. Planning for school shops should be the responsibility of the instructor, advisory committee, principal, supervisor, and architect.

2. Factors to be considered in planning are the instructional areas to be offered, class load, building standards, space considerations, and considerations for expansion.

3. Location. The laboratory should be accessible to the outside. It should be located on the first floor of the wing of the main school building or in a separate building.

4. The laboratory proper should provide for at least 75 square feet per student or a minimum total of 3000 square feet, based on
an hourly class load of 24 pupils.

5. The laboratory should have a width to length ratio of 1:2 and be rectangular in shape.

6. The walls should be 14 feet in height. Fenestration 42 inches continuous throughout. Acoustically treated for auditory comfort or with a coefficient of absorption of 50.

7. Areas of instruction should provide space for planning and library, classroom, metals, ceramics, woodworking, electricity, construction, transportation and power.

8. Auxiliary areas should provide for storage, finishing, tools, supplies, displays and exhibits, offices, and toilet facilities.

9. Floors should correspond to the type of activity for each area such as: cement floors for metals and auto mechanics, wooden floors in the wood areas, and the like. They should be insulated to reduce noise and prevent transmission of noise to other rooms.

10. Shelving and racks should conform to the specific uses.

11. Two exit doors opening outward, one of which is larger than the largest piece of equipment to be placed in the shop.

12. Lockers of the recessed type should be so located that they can be supervised readily by the instructor.

13. Washing facilities, a sink, a drinking fountain, and hot and cold water should be provided.
14. Gas welding storage tanks should be kept outside.

15. Electrical outlets of double type, one for every 10 feet of wall space. Master switch box located so that it is easily accessible to the instructor.

16. Natural lighting is always desirable. Artificial general lighting (fluorescent) of 100 foot-candles at bench height. Localized lighting wherever working to fine tolerances.

17. Ventilation through windows or air conditioning units. Exhaust fans for removing shavings.

18. Machines should be located outside of traffic lanes and mounted to minimize vibration.

19. The color scheme should be in shades of green with a cream colored ceiling. Danger zones should be painted on the floor. Machines should be painted in neutral colors.

20. Management or office centers for instructor and student leaders should face the laboratory area. Clear glass windows are required.

21. A laboratory assembly area 20' x 24' in size is desirable. It should be equipped with a desk, demonstration table or bench, other tables and 24 straight chairs, 20 feet of chalk board, 20 feet of bulletin board, technical library, cabinets for storage of blueprints, catalogs, and reference materials.
22. Utilities such as compressed air, electricity, gas, and water should be provided.

23. A fire extinguisher and first aid kit should be a part of the regular equipment.

24. Trash receptacles and fume hoods are required.

25. Temperature should be maintained at 68 degrees Fahrenheit.

ORGANIZATION AND ADMINISTRATION

The development of industrial arts weighs heavily on those responsible for the general program as well as with those charged with industrial arts. Thus, the following recommendations are proposed:

1. Industrial arts should be a part of the total school program. North Carolina school programs should offer a variety of experiences and activities pertinent to the needs of the students. Emphasis should be placed on the major areas of industry in at least 3 to 6 areas. These are drawing, woodworking, metals, ceramics, construction, electricity, power and transportation.

2. Schedules and loads: Total time for industrial arts in the secondary school should be from 180 to 450 minutes per week. Teacher load should range from 20 to a maximum of 25 students per class. There should be 3 to 5 activity areas per teacher with 5 to 8 students per area.

3. The industrial arts teacher should possess an effective teaching personality and a natural aptitude for working with
tools, machines, and construction materials. He should be able
to work with others. He should read and contribute to professional
publications. He should participate in local, state, and national
professional meetings. He should be of sound health and moral
qualifications.

4. The responsibility for promoting the industrial arts pro-
gram is usually centered in a supervisor working directly under
the superintendent or one of his assistants. Emphasis should be
placed on special needs of industrial arts in matters concerning
curriculum, equipment, physical plants, personnel, instruction,
materials, methods and techniques.

5. Budgets are important aspects of the program and should be
given careful consideration. Supplies should be provided by the
school system. Where products become the property of the students,
they should pay for the materials involved. Attention should be
given to replacement of obsolete, broken and dangerous tools and
machinery, and to the maintenance of the shop.

6. Industrial arts courses should be provided for all.

7. Opportunities should be provided for increased specializa-
tion according to maturity and need.

8. Public relations must be provided for through media of
communications such as:

   a. Fairs
   b. Open houses
   c. Newspapers
d. Radio

e. Television

f. Special speakers from industry

g. Field trips

h. Exhibits and displays

i. Chapel programs

j. Civil services such as Boy Scout merit projects, Red Cross, and the like

k. Satisfied students

9. Records and inventories should be kept of all educational activities, supplies, materials, equipment, inspections, and accidents.

STATE FUNCTIONS

The State Department of Public Instruction should be responsible for industrial arts. This should be done by a Consultant for Industrial Arts Education. He should be a person who is a proven leader in the field of industrial arts. He should be thoroughly familiar with the economic, social, and political potentials on the state and nation. His professional contacts should be broad and harmonious. He should have a clearly established philosophy concerning industrial arts in elementary, secondary, college, and adult levels. He should be able to organize and operate with distinction.

The office of the consultant should serve as a clearing house for all activities pertaining to industrial arts throughout the State. Information that is general, specific, or professional in nature relating to industrial arts should be disseminated from this office.
State level functions should in general be under the sponsorship of the consultant.

Adequate financial support should be provided by the State to assure a minimum program of industrial arts at all levels.

Salaries should be attractive enough to maintain competent personnel in all programs.

TEACHER EDUCATION

The staff, facilities and programs of industrial arts at the college level should be the best available for preparing and serving the industrial arts programs of the State.

This may be accomplished through research and dynamic curriculum offerings. Follow-up, field service, and inservice training should be sponsored. Graduate offerings in industrial arts education should be provided for professional growth and development. Leadership should be provided by sponsoring and participating in general groups, and professional scholarship through professional organizations and fraternities. Contributions should be made to professional journals and publications. Local and State committees for industrial arts should be organized with representation from labor, agriculture, education and industry. Experimental centers should be established in the State, at least one each in the Eastern, Piedmont, and Western sections. These should serve as models or patterns for organizing programs.
Chapter X

SUMMARY

This dissertation is concerned with the analysis and projection of an industrial arts program in the public secondary school programs for Negroes in North Carolina. It seeks to answer the following questions: (1) What are the needs of these youth? (2) What do these imply for education? (3) What possibilities does industrial arts possess for resolving these needs? (4) What is the status of industrial arts in the public secondary schools for Negroes in North Carolina? (5) How can these programs be made to accomplish their ultimate mission? The socio-economic situation and the potentialities of industrial arts programs are investigated and the findings suggest that these programs can be made effective.

FINDINGS OF THE STUDY

There are 500,000 Negro workers 14 years and older in the labor force of North Carolina. Of these, 425,000 are farmers, laborers, and domestics. There are 24,000 employed in the professional, managerial, clerical and skilled occupations. The transition of this group from an agrarian to an industrial economy involves problems of industrial orientation, consumer literacy, and recreation.

The average educational attainment of Negroes in North Carolina is the sixth grade. Only one-third of the children entering the
first grade finish high school. Only one-half of those entering
the ninth grade finish high school. Only 3 percent graduate from
college.

Modern day industrial arts seeks to orient children of all
ages and both sexes in the production and consumption of a tech­
nological society. Its curriculum includes such divisions as:
construction, manufacture, power and transportation, communications,
management and the services, and these were examined in turn.

Over a year of study was devoted to investigating the 36 indus­
trial arts programs located in 29 counties of North Carolina to
learn their status and to project a program that would achieve
the above.

Industrial arts is not now adequate in these programs. Objec­
tives, methods and devices, organization and teacher competencies
are favorable, but the curricula and physical settings are not
satisfactory.

CONCLUSIONS

The necessity for extending the educational opportunities of
Negro youth, to understand the nature of technology and its many
contributions, to develop useful skills, to know how to produce
and consume its products and services wisely has stimulated the
following recommendations:

1. That industrial arts be provided on the elementary,
   secondary, college, and adult levels based on the economic and
cultural potentialities of the individuals involved.

2. That all boys and girls enrolled in the secondary school programs be encouraged to elect industrial arts.

3. That industrial arts include basic experiences in drawing, manufacturing, construction, communications, power and transportation, management and the services.

4. That teacher education programs provide preparatory and in-service experiences for teachers paralleling the type of program required in North Carolina.

5. That consultants be appointed to stimulate the improvement of instruction in industrial arts.

6. That advisory committees with representatives from education, industry, and government be appointed to help in planning and developing the program.

7. That experimental and inservice centers be established to show the trends in such items as the physical setting, curriculum, methods and devices, and organization and administrative procedures.

8. That students receive instruction concerning labor, management, and employment.

9. That stress be placed on consumer literacy, or in selecting and using the products of industry wisely.

10. That worthwhile use of leisure time be stressed through clubs, home workshops, and adult programs.
11. That an adequate budget be provided to support valid programs of industrial arts.

12. That all school officials be made aware of the pressing need for industrial arts, by making personal visits and publishing a prospectus or interpretation bulletin.

FUTURE STUDIES NEEDED

Some studies for future consideration are:

1. The nature of industry in North Carolina.
2. Industrial arts programs in North Carolina.
4. Budgetary provisions for industrial arts at all levels.
5. Periodic follow-up studies of industrial arts in the public secondary schools for Negroes in North Carolina.
6. A continuous study of industrial arts curricula designed to reflect technology.
7. A comparative study of the industrial knowledges and skills possessed by students enrolled in industrial arts.
BIBLIOGRAPHY


50. Utah, State Department of Public Instruction. Industrial Arts in Utah. Part I and II, Salt Lake City, 1941.


53. Warner, William E. Principles of Industrial Arts Laboratory Planning. The Ohio State University, Columbus, 1950.

APPENDICES
Appendix A

STANDARDS FOR INDUSTRIAL ARTS IN SECONDARY SCHOOLS
Copy of a Letter of Request

THE AGRICULTURAL AND TECHNICAL COLLEGE
Greensboro, North Carolina

April 17, 1954

Dr. DeWitt Hunt, Chairman
Department of Industrial Arts Education
Oklahoma A and M College
Stillwater, Oklahoma

Dear Dr. Hunt:

This concerns my study of the status of industrial arts in the public secondary school programs for Negroes in North Carolina.

What standards, criteria, or evaluative check-lists are used in Oklahoma for this purpose? I would appreciate your forwarding any information of this sort at your convenience.

Sincerely,

(s) RALPH L. WOODEN
Associate Professor
Appendix B

SIXTEEN STATE LEADERS
Who Were Addressed as Per Appendix A

Anderson, R. N. Director, Rehabilitation and Special Education, State Board of Education, Richmond 16, Virginia

Carmichael, Harry W. Supervisor, Trade and Industrial Education, Des Moines 19, Iowa

Comstock, E. C. Executive Director, State Department of Vocational Education, Denver 2, Colorado

Cox, George B. Chairman, Department of Industrial Arts Education, State College, Corvallis, Oregon

Fales, Roy G. Chief, Bureau of Industrial Arts Education, State Education Department, Albany 7, New York

Hatfield, Carson A. Supervisor, Secondary Schools, State Department of Education, Madison 2, Wisconsin

Hunt, DeWitt. Chairman, Department of Industrial Arts Education, Oklahoma A and M College, Stillwater, Oklahoma

James, Herschel M. Supervisor of Industrial Arts, State Department of Education, Baltimore 1, Maryland


McComb, H. G. Director, Trade and Industrial Education, State Board of Vocational Education, Indianapolis 4, Indiana

Roberts, Dale. Supervisor of Industrial Arts, State Board of Vocational Education, Springfield, Illinois

Stoner, Robert T. Director, Bureau of Adult, Vocational and Practical Arts Education, State Department of Public Instruction, Harrisburg, Pennsylvania

Thomas, Harry C. Supervisor of Industrial Arts, State Department of Education, Baton Rouge 4, Louisiana

Wheeler, Martin C. Director, Trade and Industrial Education, State Department of Education, Jefferson City, Missouri
Wick, S. R. Assistant Director, Trade and Industrial Education, State Department of Education, St. Paul 1, Minnesota

Williams, Walter R., Jr. Director, Division of Vocational and Adult Education, State Department of Education, Tallahassee, Florida
### Appendix C

INDUSTRIAL ARTS TEACHER DIRECTORY OF
Negro Teachers in the Secondary Schools of North Carolina

<table>
<thead>
<tr>
<th>City</th>
<th>School</th>
<th>Instructor</th>
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<td>Albemarle</td>
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<td>Charles Holley</td>
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<td>Jones</td>
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Appendix D

COPY OF LETTER REQUESTING PERMISSION TO VISIT

THE AGRICULTURAL AND TECHNICAL COLLEGE
Greensboro, North Carolina

August 24, 1954

Mr. Samuel E. Burford, Principal
William Penn High School
High Point, North Carolina

Dear Mr. Burford:


I am in the process of studying each of the thirty-six schools concerned and would like to have permission to visit your school some time during the academic year. It would be appreciated if you would indicate which time of the year would be preferred.

The enclosed self-addressed postal card will expedite your reply.

Sincerely,

(s) RALPH L. WOODEN
Associate Professor

Enc.
AUTOBIOGRAPHY

I, RALPH LEE WOODEN, was born in Columbus, Ohio, March 29, 1915. I received my secondary education in the public schools of the city of Columbus, Ohio.

My undergraduate training was obtained at the North Carolina Agricultural and Technical College, Greensboro, North Carolina, from which I received the degree Bachelor of Science in 1938. From The Ohio State University, I received the degree Master of Arts in 1946. In January, 1947 I received an appointment as Associate Professor of Industrial Arts Education at the North Carolina Agricultural and Technical College.

In 1949 I was granted a leave of absence for one year to study at The Ohio State University. I resumed my work in September, 1950 at the North Carolina Agricultural and Technical College. This position I have held while completing the requirements for the degree of Doctor of Philosophy.