A COMPARATIVE EVALUATION AND ANALYSIS IN TERMS OF NATIONAL DEFENSE OF THE NATIONAL YOUTH ADMINISTRATION, THE NATIONAL DEFENSE TRAINING PROGRAM, AND THE STATE TEACHERS COLLEGES' INDUSTRIAL ARTS PROGRAM.

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THE NATIONAL DEFENSE TRAINING PROGRAM,
AND THE STATE TEACHERS COLLEGES' 
INDUSTRIAL ARTS 
PROGRAM

THESIS

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CHAPTER I

INTRODUCTION

Statement of the Problem

The problem in this study is to evaluate and analyze in terms of national defense: the National Youth Administration; the National Defense Training Program; and the State Teachers Colleges' Industrial Arts Program as offered in the curriculum.

Limitations of the Problem

Data and findings are limited to that phase of each of these programs entailing or related to national defense. In view of the fact that the National Defense Training Program was established as recently as the fall of 1940, it has not been possible to secure complete data concerning it.

Purpose of the Problem

The objectives of this study are: first, to draw conclusions in regard to the extent the National Youth Administration, the National Defense Training Program, and the Industrial Arts departments of the Texas State Teachers Colleges are making "trainees" of the first two programs.
and graduates and students of the last division more employable in the several industries that make up our national defense manufacturing mechanism; second, to show by the presentation of the college programs whether or not the colleges are presenting the courses of industrial arts which are most needed by youth in this time of crisis and national defense preparation.

Definition of Terms

The National Youth Administration may be defined as a governmental agency making an effort to contact and present a program of education under several heads, with the primary goal of making the youth of America more employable.

The present study is limited to the phase of national defense and the part that the N.Y.A. is taking upon itself during the present world crisis.

The N.Y.A. deals with the youth of the United States who have had few opportunities to take advantage of educational facilities, chiefly the youth from the rural areas.

The National Defense Training Program is likewise a governmental agency whose sole purpose is to contact and bring together the male youth into classes for training under competent instructors in those fields of industrial training that are related directly to the national defense industry.

Industrial arts may be defined as that phase of general
education pertaining to the formation of skills in general shop courses. A student in industrial arts has to be able to correlate the skills of manual activity with the processes learned from experience, perception, or related training of printed classroom instructions.

In the summer of 1940 through the Office of Education, $15,000,000 was appropriated for allotment from time to time to the several states to finance "vocational" courses supplementary to employment in occupations essential to national defense and pre-employment refresher courses for workers preparing for such occupations.

"A demand to expand and extend such Defense Training Programs to meet the needs of out-of-school rural and non-rural youth soon developed. This demand came largely from the rural areas and was actually sponsored by the Washington representatives of all leading farm organizations. The result was that subdivision (4) under the heading of 'Office of Education' was included in Public Bulletin Number 312, which made an appropriation of $10,000,000 for education and training of out-of-school rural and non-rural youth as defense workers.

"Both rural and non-rural youth would also be served by giving them the opportunity to enroll in specific trade schools and industrial arts shops of the larger secondary schools in consolidated rural districts and in the
city school systems."¹

The teachers colleges' industrial arts program is or should be closely connected with the National Defense Training Program, since the majority of the teachers of the two above programs come from the colleges or have at some time had a part or all of their training under this department.

Also it has been noted that in the beginning the colleges were called upon to furnish not only the teachers but the space and sometimes the equipment and tools for the classes under the N.Y.A. and the National Defense Training Program. Later these classes gained appropriations with which they obtained other locations for classes and new equipment and tools.

The work offered in the department of industrial arts of the colleges has been of a nature that would make the work preparatory for the entering of industries where defense mechanisms and manufacture are doing the job of national defense equipment and preparation.

Sources of Data

Most of the data for this study have been obtained from periodicals and pamphlets, since the relatively short time that these groups have been established has not

permitted the writing of books and texts on the subjects and related training. Much of the material has been obtained from the bulletins of the National Youth Administration, dealing with the original set-ups and directions for supervisors and coordinators.

Since the establishment of the National Defense Training Program is less than eight months old the same conditions govern the finding of data and information relative to its evaluation and analysis.

At a recent out-of-school conference held on the campus of the North Texas State Teachers College many of the state coordinators, supervisors, and directors spoke and much information was obtained in the form of notes from these speeches on the National Youth Administration and the National Defense Training Program.

Proposed Treatment of Data

The problem to be treated herein is an analysis and evaluation of the industrial training program for youth in terms of national defense needs. The three phases of the problem are: (1) the National Youth Administration; (2) the National Defense Training Program; and (3) the Teachers Colleges' Industrial Arts Program. The data procured are to be used in an effort to show the relative extents that the above mentioned programs have singly and collectively aided in the national emergency and have brought to the
rural and non-rural youth means or sources of livelihood and sources of employment that did not exist until the establishment of these agencies.

Some Related Studies

Since this particular phase of the defense mechanism is relatively new, little has been said and done about the combined efforts of the three agencies that the writer is using as a basis of comparison.

While much has been written about the several programs, they have not been combined to formulate the working out of the unemployment situation, and at the same time to prepare the youth for the gigantic future ahead, the national defense work, and the preparation of the youth for an individual job such as will permit him to find his way into industry at the cessation of the present crisis.

The National Youth Administration Program was not set up originally as a defense measure but to relieve the unemployment situation, and to give youths training that would enable them to develop potential skills which otherwise would lie dormant. Now we find that the N.Y.A. is cooperating with the defense industries, and is correlating the shop work offered to the needs of the new industries which are operating on such a large scale in order to produce the defense materials needed by our government and other nations which we are supplying with war machines and materials.
Howard M. Bell in the report to the American Youth Commission gave the following classification of youth after a study of some 4,000 between the ages of 16 to 25 who registered in the employment offices of St. Louis and Baltimore. "Of the total group of 4,000 applicants the majority could not be classified occupationally on the basis of either work done or training received. It is significant to note the difference which appears in the several age groups between 16 and 25. Practically all the 16 year old youth, 99 per cent, could not be so classified and, according to Project standards, were in need of vocational counselling. Of all the 18 year old almost nine-tenths, 87 per cent, clearly needed diagnostic study."  

So we can see from this evidence the serious need for classification of work which should point to one or more types of work for the student to adjust himself to and concentrate upon while in school. Too many of the youth today and in the past have merely gone to school; the end of school days arrives and they are not prepared to go into the world and do any particular type of classified industrial work. To be sure for a time in the East there was always a job selling bonds, but this steady step in the path of future associations and jobs vanished with the lean years since 1929. Today unless one is

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2 Howard M. Bell, *Matching Youth and Jobs*, 1940, p. 29.
definitely prepared in some measure there is no chance to find work other than the most meager and makeshift and this is never permanent and satisfying.

To quote again from Howard M. Bell: "Only a small majority of our youth who could be absorbed profitably as apprentices are now indentured. For example, the Committee on Vocational Education of the Associated Industries of Cleveland found that 'there were in 1936, approximately 36,402 skilled workers in ten major crafts and approximately 600 apprentices.'" 3

"Whatever the opportunities for employment may be, youth have not been receiving a proportionate share of them. This does not imply that there exists among employers an animus against young persons in search of jobs, ... Ways must be found to make young persons employable in the wider sense, and we must give them such assistance that they will be able to compete on equal terms for opportunities that do exist." 4 Youth have not been trained to be able to fit themselves for a particular work. They are willing to work and many times while making application for work will say that they can do anything. This usually tells the employer that they are not fitted for a special job and are merely excess labor on the market.

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3 Ibid., pp. 63-64.

Although this study deals almost exclusively with industrial work and the many phases of it, the criteria that will be applicable here will likewise be applicable on most other types of occupations, and it is thought that when we are out of the present world crisis the educators and the industrialists will have seen the fallacies of the present systems of youth preparation and made amends accordingly.

The report and recommendations of the American Youth Commission of April 16, 1940, asserts that, "most communities at present are failing to provide in their public schools adequate vocational guidance or training adjusted to the needs of the local labor market. In too many instances, school curricula, because of lack of funds or absence of progressive educational leadership and forward looking school boards, have not been changed sufficiently in the past half-century to meet significant changes in working conditions and work opportunities." 5

Again, this well illustrates the situation prevalent for some years; the youth are not located where the job vacancies exist, or if in proximity to industry they do not have the training to enable them to take advantage of these opportunities.

To quote again from the report and recommendations of the American Youth Commission of April 16, 1940, "... in this connection it should be observed that the federal government through the National Youth Administration, has provided excellent community opportunities which in many localities have never been completely utilized. Every community should act on behalf of its own youth without waiting for stimulation through agencies of the federal government but when the services of those agencies are available the community should take advantage of them." 6

One example of industry training is illustrated by the Ford Trades Schools at the plant of the Ford Motor Company in Dearborn, Michigan. Here youth of several age groups are enrolled in the three schools and are trained in hand skills, and at the same time related classwork is being studied. This related training is somewhat different from that which is generally taught; the studies are simplified and much of the theory omitted from the textbooks and in this way the students who are to become industrial workers and technicians are given the class work that will apply directly to the skills they are to work in. Mr. Frederick E. Searle, the superintendent of the Ford Trades Schools, has this to say in regard to the situation of youth in industry, "... there are three principal agencies which

6 Ibid., p. 5.
can be used for this training program; public schools, schools in large industries, and schools in small industries. The latter two have been separated, not because there is any natural or logical difference between them, but because many managers feel that the small size of their plants makes a training program ineffective or impossible. Such an attitude will do a great deal to hinder real progress and the small shops will suffer first and also most." 7

Again quoting from Mr. Searle, "... education was originally only for the well-to-do and prepared them only for professional work. This sort of education, extended to include everyone, has resulted in teaching boys to covet jobs and positions for which they are not prepared, and for which they frequently have few qualifications. It has resulted in much of our current discontent and our greedy acceptance of new ideas simply because of their newness." 8

Thus we are able to see the viewpoint of one of the great industrial organizations and their views as to the work of the schools in connecting related work with the skills to be acquired in the use of shop machines and materials.

In this schooling of boys of teen age, it is remarkable

7 Frederick E. Searle, Preparing High School Graduates and Others for Skilled Work in Industry, Address, Feb. 16, 1940.

8 Frederick E. Searle, Training Youth for Industry, a pamphlet, p. 6.
to find the ability with which they are able to make progress in so short a time under the expert teaching and guidance of the trades schools. Another interesting feature was that the youth in making certain tools of steel to be used in the Ford plant proper were so efficient that the spoilage of materials was negligible, - less than one per cent for several hundred boys.

McGill and Mathews in the Youth Survey of New York City have compiled many figures on the unemployment of youth, the range in ages, and percentage of male and female. Quoted below are some figures on the unemployment of youth. "Of a total of 6,274 youth, 3,264 males and 3,010 females, some 3,277 were employed; 2,997 were unemployed, of those previously employed at some time were 1,867 males and 1,126 females never employed. In the range in years never employed were; under 13 years 36.8 per cent, 13 to 20 years 47.4 per cent, 21 to 24 years 15.8 per cent." 9

Again quoting McGill and Mathews, "... unemployment has been more extensive among the sons and daughters of industrial workers, but it has been extensive among those from white collar families also." 10

Thus we find the largest percentage of the unemployed in

10 Ibid., pp. 156-157.
the age group of 16 to 20 years. These figures are previous to the development of the N.Y.A. and the National Defense Training Program, so we can see reasons for the establishment of plans to take this large group of youth and place them in productive employment, since the defense industries have been suddenly called upon to hit a stride of production that has not been equalled in any country in so short a period of organization and training for skilled industrial jobs.

The Dallas Youth Survey compiled figures and facts on the unemployment situation in the city of Dallas. This, too, was prior to the efforts of the N.Y.A. and the National Defense Training Program, yet it showed even more reasons for efforts to put youth into training for industry. 11

In this survey, home conditions and the standards of living were studied. The majority of the youth contacted were from homes broken up by divorce, death, or desertion. Twenty per cent of the youth lived away from home and a percentage of one out of nine expressed the desire to leave home.

With the establishment of resident centers of the N.Y.A. a small percentage of youth will be removed from unfavorable living conditions and placed in association with youth of their age range, fed balanced diets and trained to become

efficient in some field of industry. The rewards of this program have been contented youth, a means of livelihood, and a feeling of independence which takes the surliness out of those boys and girls who have been unable to take care of themselves owing to a lack of employment.

So through related studies of the problem it is clearly shown that there is indeed room for agencies to aid in the training of youth for industrial defense, since the armies of today are born out of industry. Thus out of industry we must be trained in the manufacture and upkeep of materials to be used in our defense of the nation.

Summary

In the analysis and evaluation of some youth education agencies, the National Youth Administration, the National Defense Training Program and the Teachers Colleges' Programs of Industrial Arts have been selected for this study.

The purpose is to draw conclusions relative to the extent each of the programs is preparing youth for defense jobs and methods of making them more employable.

The purpose of the N.Y.A. and the National Defense agencies is to make the trainees more employable and to give them work experience and economic subsistence while enrolled in the defense courses.

Attention has been centered on youth who have for any reason left school or at the present time are not in any
school. This phase of the programs has become known as the out-of-school youth education agencies. Rural and non-rural youth have been reached and shown the advantages of such industrial training as will be of value to them as well as to the defense industries, at the time of completion of their period of training.

Since there is a severe shortage of skilled labor which is so vital in the manufacture of defense materials and the operation of machines and plants of such industries, it has become a national problem. The federal government has appropriated some $15,000,000 for the instruction and equipping of schools for this purpose.

The depression years have separated many men from formerly acquired skills and the use of refresher courses has greatly aided in helping these men who have been skilled to become again of use in industry.

In the related studies much of the material used in this study was published prior to the beginning of the defense preparations on a large scale and they deal almost exclusively with youth surveys and recommendations for youth advisory groups that have been selected to aid in working out methods of combating youth unemployment. Applications of principles and suggestions of several of these committees have been of value to the federal agencies in preparation of materials to be used as related training in the class work that goes hand in hand with the shop work experience program.
CHAPTER II

EVALUATIVE CRITERIA OR MEASURING INSTRUMENT

Criteria

To determine in terms of national defense the effectiveness of the National Youth Administration, the National Defense Training Program, and the Teachers Colleges' Industrial Arts Program, criteria have been established.

The writer has applied criteria to the various phases of each program in the light of specifications and requirements originally set-up, and also in the way each program has adjusted itself to the demands for a speedy defense production. Comparisons as to the value of shop activities and related training or subject matter have made possible certain conclusions and recommendations.

General conditions of youth prior to the establishment of the government agencies, decreased unemployment with the demands for skilled labor in defense industry, health and nutrition, the acquisition of skills and the eventual employment in private industry as direct results of some out-of-school or college training, have been the basis of criteria in making this study.

To set up this criteria the following questions will be discussed:

1. To what extent is the N.Y.A. preparing youth for
defense jobs?

2. To what extent is the National Defense Training Program preparing youth for defense jobs?

3. To what extent are the teachers colleges preparing students for defense jobs?

4. Are the youth from the above agencies being accepted as workers by defense industry plants?

5. Are adequate safety measures being taken for students and youth on the three programs?

6. Are individual skills being developed? To what extent?

7. Has the individual youth become more employable while working in the various defense programs?

8. Is the related training program in each agency of definite educational value?

9. To what extent is working on a project-production-basis of future value in private industry for defense?

10. To what extent have skills and related training been of positive value to the individuals?

The establishment of resident centers for the training of the youth under the N.Y.A. set-up has made possible a very practical program of instruction (to be taught in conjunction with related training) consisting of these courses: aviation mechanics, auto mechanics, electricity, radio, sheetmetal, drafting, foundry, woodworking, carpentry, welding, painting, and blacksmithing.

Among the subjects taught under related training in
addition to the above courses are: blue print reading, mechanical drawing, mathematics, stenography, business English, and general office practice. In the field of related training it is essential that certain literature and texts be followed in order to get a broad course of study. Shop work alone is not enough, since this would not give the student or trainee a proficiency broad enough to be of value to the defense program. With an ability to do the work of the shop and at the same time to be able to read blue prints and follow the directions for machine and sheetmetal working the worker may be then assigned to a project, take the necessary materials and complete the project without the aid of an instructor to give the directions and dimensions.

Learning to make the necessary drawings which must accompany certain machine involvements is another feature of the N.Y.A. related training. Most of the youth are out-of-school youth and the majority of them have not had enough school work to make them proficient in any of the related training. Accordingly provisions must be made to remedy these deficiencies.

In the resident N.Y.A. centers, the youth are established in living quarters for a period of six, nine, or twelve months, depending on the locality and the demand of the out-of-school youth for the work offered. During this period of training the school day is divided between shop
practice and the related training. Pay is received for the work in the shops while no pay is received for the time spent in the class work.

During the past year the work of the N.Y.A. to a large extent has been centered on defense work. Prior to this time the work was directed to activities of a civic and a public nature; this practice still prevails in localities where there is no demand for defense training and in localities geographically too distant from industrial plants to be of value as training centers.

The National Defense Training Program has been directed toward reaching rural youth more than the urban youth. For this reason work of a nature appealing to rural youth has been offered, such as farm shop, auto mechanics, welding, carpentry, woodwork, the operation and care of tractors, trucks of both gas and Diesel design, agriculture, and prevocational training.

Obviously this type of work is closely associated with the program offered by the N.Y.A. defense program. The Advisory Board of the National Defense Council emphasizes the central idea that the trainee, upon the completion of one or more classes at the Defense Training School, is prepared to move on to the schools near the defense plants, e.g., airplane factories. Additional work taken at this stage will prepare them in a short time to enter into active production on a level with the regular workers of the plant.
Necessarily a part of the youth taking this type of work will for several reasons not be available to industry. Some of these reasons are: low mental ability, as many rural youth quit school at an early age; family conditions will not permit others to leave the home community; dislike of certain phases of the work will keep many on the farm or in the small rural community. Even under these conditions the training should have an effect on the youth and make him more valuable to the nation on the productive side, since many of the essential materials of defense are produced on the farm; moreover, a better way of living will be introduced into many homes by virtue of the training received.

A different situation has existed in the industrial arts departments of the state teachers colleges; there has been no effort on the part of the colleges or of the Defense Council to place any of the responsibility of the movement upon the college curriculum. However, a part of the work being taught the out-of-school youth under the other two agencies is and has been taught in the colleges for many years, such as: woodwork, mechanical drawing, machine shop, sheetmetal, drafting, auto mechanics, electricity, welding, carpentry, foundry, and farm shop.

There is a difference in the methods of teaching in the colleges and in the defense schools, but a great part of the knowledge gained is virtually the same. A number of youth who have had several years of college industrial
arts work have gone directly into some of the industrial plants; there they found themselves on a par or many times superior to those workers on the job without the related training taught in connection with shop work in college. The main factor lacking on the part of college trained youth is that the work they have had in college has not been on a production basis; consequently they must acclimate themselves to the new plan.

The college youth in industrial arts has been permitted to center his time on the completion of from three to six projects during the semester. Necessarily several minutes are used in preparation at the beginning of the period; time is allowed at the end of the period for cleaning up and placing tools and equipment in their proper places, therefore sometimes as much as thirty minutes may be lost out of a two or three hour work period. In the defense schools, however, longer work periods are permitted and much more work can be completed since no time is lost in short time periods and in time allotted to go to classes in other buildings.

The youth of the three agencies are being used to a large extent in the defense industrial plants. There has been a steady demand for sheetmetal workers, riveters, machine shop workers, painters, auto mechanics, aircraft mechanics, welders, electricians, radio operators and repair men, hot and cold metal workers, as well as supervisors
and foremen in all departments.

The trainees of the agencies in this study are not turned out as skilled workers; they are furnished with work experience enabling them to be ready for a job in airplane factories, signal corps of the military service, shipbuilding and other industries. With a skill and experience not found in the man on the street much less training and instruction is necessary after being employed in the defense plants.

It is especially noteworthy that a large number of college majors of the industrial arts department are now supervisors and inspectors in airplane factories.

Many youth upon entering college take classwork in industrial arts but if they do not find it greatly to their liking they do not major in this field. However, those that do complete the required hours in the subject in most cases have found a liking for the industrial arts and a satisfaction in new skills in the use of tools and machines both on wood and metal.

Since the trainees of the N.Y.A. and the National Defense Training Schools have the advantage of the Texas State Employment Service, there is little chance during the present demand for defense workers that they will be unemployed upon the completion of the training period.

There are several airplane plants now operating in Texas. These will employ several thousand men as well the
ship yards now under construction. The newly trained men
will be guided into these new industries, and the jobs for
which they are best prepared, upon the recommendations of
the N.Y.A. and National Defense Program instructors who
have trained them.

Each of the agencies provides a safety program. Since
the use of machines must be a part of the trainee's and
student's work, each group is instructed in the dangers of
such machines. Adequate protective devices are provided
when needed in order to remove danger hazards.

The use of placards, pictures, and sheets of instruc-
tions, as well as oral instructions are a part of the related
training program of each group. This is given before the
use of the machines is begun, for as it is often said,
"an ounce of prevention is worth a pound of cure." There
is no need to tell a student after having fingers cut off
or limbs mangled to be careful, so the problem of individual
safety is highly stressed in all courses of college and
governmental instruction.

Guards are required by law to be used on circular
saws, shapers, and similar power driven machines for wood-
working shops. Rubber floor pads are provided in most
shops so that sawdust and shavings will not cause slipping
or loss of balance near these machines.

Goggles are provided for classes in welding, both
oxy-acetylene and arc welding. These serve a dual use since the white heat is dangerous to the eyes and they also protect the eyes from molten metal that sometimes pops up.

Pulleys and belts are guarded to avoid catching the clothing. Students are instructed in the kind of clothing to wear while working with machinery in machine shops.

In the electrical and radio fields suitable measures of safety are provided for the handling of electricity. Insulated tools are to be used when handling conductors of high voltage.

First aid, of course, is provided; instructions are given the student so he will know how to stop or disengage certain machinery or parts of it in case of accident.

Individual skills are being developed in each case where the trainee or student is working on an individual project or a part of a production project.

In the making of machine tools of hardened steel, replacement parts for machines, it is necessary that a skilled worker handle the lathe or metal shaper or grinder, since a replacement part for machinery must be accurately duplicated. A skill is to be learned no matter what the job may be, heating steel, shaping and tempering the finished tool, polishing or plating the tool. In sheetmetal there must be developed the ability to make the pattern quickly, cut and bend or fold it, assemble it with rivets, solder
or weld it. Skill is developed in a welder; this includes the knowledge of correct proportions of oxygen and acetylene to be used in cutting certain metals, and to fuse other metals for joining together to give strength.

From this discussion the conclusion is obvious that anyone processing raw materials into finished products must attain certain skills to become a competent worker.

Are the trainees becoming more employable as a result of the training programs?

In the National Defense Training Program statistical report of June 1, 1941, the total enrollment of all courses for schools in Texas reached 21,747. Of this number a total of 1,333 have been placed in employment.

Similar conditions prevail among the N.Y.A. enrollees and industrial arts students. Many students on or before graduation go into industry, especially the aircraft industry since this industry is conveniently situated with reference to the geographic position of Texas schools. Not only do students go into industrial manufacture but there has been and is a big demand for draftsmen, blue print makers and architects; many of these students are furnished by the industrial arts departments. Many youths who are liable to military service under the Selective Service Act have been deferred owing to the need for teachers in the industrial arts field. Should there be a stoppage or bottleneck in this division, production in many plants would be
drastically curtailed since all production must be first blue-printed or sealed to production basis.

The N.Y.A. program also has been able to add to its course of study such vital skills as blue print reading, machine drafting, and architectural drafting, to help supply paper experts for the defense industries.

Before the introduction of defense training to the N.Y.A. program, the main objectives of this agency were to give youth work experience and to make them more employable. This program has enabled many youth to state his qualifications to his prospective employer in a positive way rather than merely to evince a willingness to try any job available. Industry and business too often in the depression years have been faced with unskilled applicants.

Through the American Youth Commission, the United States Office of Education, and other youth survey groups, statistical data were available to guide the N.Y.A. course of study; thus the N.Y.A. was able to take available data and to offer to youth from many economic groups a balanced course of study, including shop work and related training. Upon termination of the period of training many trainees were placed in satisfactory employment.

With the opening of the National Defense Training shops in the fall of 1941, probably on a twelve months basis, many students with industrial arts training are to be called as teachers. Since there is a common ground for
most of the work of the three agencies, many students of the teachers colleges are well equipped to become defense training teachers.

This likewise applies to N.Y.A. teachers as well. Cabinet makers, mechanics and carpenters have been tried as teachers, but due to a lack of education many have not been successful as teachers.

"Becoming more employable" is applied to students and trainees aptly, since they - unlike many other youth in education - have had experience "by doing" in their projects, along with a regulation period of related training on the educational side of the project.

Related training of the N.Y.A. and the National Defense Training Program is based on the general idea of supplementary classroom work to fill out the required knowledge to complete competently the shop work projects that are being done.

Common sense dictates that certain mental and physical calculations are necessary before a worker in a shop can make a chair to conform to size, type of legs, solid or upholstered seat, number of rungs, et cetera. Plans must be available or they must be drawn by the worker and followed accurately if the finished product conforms to specifications.

The workers of these agencies must be able to follow a simple blue print or drawing, to make mathematical
calculations of measure, and to be able to figure lumber
in board feet; all of this is essential if the worker is
to be able to figure costs.

The study of types and classifications of woods,
finishes, kinds of metals, the uses of metals for certain
specific purposes, the performance of both gas and Diesel
motors and other problematic studies must be undertaken
by the student in training. These studies cannot always
be done at the time the project is actually undertaken.
However, as nearly as possible a class schedule should be
drawn to allow the workers to advance in studies along
with the project work.

The original plans of the N.Y.A. called for five out
of eight hours to be in shop work with the remaining three
to be occupied in class work.

Similar class work periods are used in the National
Defense Training Program. In this program, like the N.Y.A.,
the youth are all out-of-school workers. Since many of
them have not reached an educational level equal to their
chronological ages, the need is apparent for subject matter
study. Moreover the youth have never had any mechanical
or shop experience of any type, and they cannot be taught
all shop work without the aid of instruction in the related
subjects.

The college industrial arts classes naturally have
better facilities, and the students are required to take class work along with the shop laboratory practices.

Like the other two agencies, this time spent in class deals with related subject matter. Much time and trouble can be saved by giving group discussions of materials and methods rather than by taking one student at a time in the shop laboratory.

Many instructors use a job sheet method of instruction. This covers the particular project with questions to be answered and it prepares the student for future projects.

The foregoing discussion definitely shows that training work has been of an educational value in all of the agencies.

In industry, the machine age has placed us on an assembly line production basis. In college work, students are far behind this practice; they work as the "guilds" did centuries ago by "the individual project method." There is no apparent reason for introducing any other method since "the individual project method" permits the student to go through all the steps from raw materials to the finished products.

Efforts are being made to teach the workers of the N.Y.A. and the National Defense Training Program the value of project production which is, in a small way, assembly line production. Two or more workers are able
to work together in this way and they accomplish much more by each one doing a different part of the required work. The product is then finished more quickly than each could have done the work separately. This enables them to become acquainted in a measure with the type of work that is to be expected of them in industry.

Have the N.Y.A., the National Defense Training Program, and the college industrial arts workers been benefitted by the skills acquired and the related training studied?

Shop practice is valuable as a means of livelihood, hobbies, and the ability to make instruments, tools, and machines for personal use.

Several of the large department store chains handling wood and metal tools and machines have had an increased sale of these products in the past ten years. The majority of this has been strictly for home shop work. The making of furniture and household articles has interested many men and boys. This has largely come about from observation of public school and college industrial arts shops and from exhibitions in the sales rooms and at fairs. Therefore many have discovered a mechanical ability heretofore unobserved or neglected and now furnishing them with a wholesome way of using leisure time and often reimbursing them from the sale of articles they have made.

Skills in the use of machines and tools learned through one or all of the agencies of this study are
permitting the workers to be called into industry, since two of the agencies have had the aim of securing for the trainees work experience and the making of the trainee more employable. A youth able to operate a metal working lathe is certainly more employable than a youth with little schooling and only farm life experience.

To have a practical skill gained in one of the agencies and at the same time to lack the background educational knowledge to go along with the skill does not permit the worker to take full advantage of the increasing opportunities for employment. To correct this difficulty federal funds have made possible the development of the related training work in order that the worker will not lack the technical knowledge so essential to efficient industrial production.

Skill without technical knowledge, or vice versa, is to cripple the worker and deter his advancement as a skilled worker for defense purposes.

Summary

The criteria chosen as a means of measurement are: the extent to which the programs of the N.Y.A., the National Defense Training Program, and the Teachers College Industrial Arts departments are preparing youth for defense industry work; the acceptability of such youth by industry; adequate safety measures for youth during training
periods; the extent to which the youth are more employable on finishing the periods of training; the educational value of related training; the value of project production training in industrial plant jobs; and the value of related training and skills as taught to the individual.

Efforts have been made in this discussion of the criteria to stress the necessity of allocating youths quickly to the places where they are most needed as the world situation may be changed over night, depending upon the outcome of the wars in Europe and unrest in the Far East. Efforts are being made to educate the out-of-school youth in a relatively short period of time so that he can be removed from the ranks of the unemployed and placed in a job in an industrial plant doing the work for which he has been trained.

Since all youth will not be needed in industry, courses other than those of defense needs are made available and such youth are encouraged to get the training to their liking and which will be of use to them in their surroundings.

The teachers colleges' departments of industrial arts have not been directly active as defense training centers; the types of work offered by them, however, is similar to the work of the other agencies and essential to certain industrial defense projects. Consequently without much additional effort they have in a small way become an integral
part of the defense preparation. Many of the teachers of the N.Y.A. and National Defense Training schools are college industrial arts graduates or at least have had work in the department.

The value of the kind of related training offered in most college class work is quite definite since many practical workers and mechanics have failed as defense teachers owing partially to their inability to present necessary subject matter along with the teaching of their skill.

Many safety measures have been adopted from the school plants to be used in the industrial school shops and practical safety measures have thus been learned from college class work. It is only natural that through the combined use of texts and libraries that the subject matter and methods will be broader than the work experience of one or two men in industry or in machine shops.
CHAPTER III

AN ANALYSIS OF THE NATIONAL YOUTH ADMINISTRATION

Introduction

In this analysis the writer will endeavor to give a systematic explanation of the aims and objectives of the N.Y.A. as they apply to the national defense program.

"There are today in the United States some twenty odd million young men and women between the ages of 15 and 24. A high percentage of these young people are enrolled in schools and colleges. Many others are employed in business, industry and agriculture. But there are more than four million young people in this age group who have left high school and who have been unable to find jobs." 12

This has been the chief aim of the N.Y.A., to so train and educate within a period of a year, the youth of the United States that they will become more employable and obtain work experience.

The difficult problem confronting the N.Y.A. is the task of preparing young men to qualify for industrial jobs thereby rendering not only valuable defense service but also securing necessary work experience. If this problem

is successfully met they will be able to present themselves as skilled or semi-skilled workers. It has not been the purpose of the N.Y.A., or any governmental agency, by its new training program for the unskilled to eliminate unemployed skilled workers who lost their jobs during the depression years. However, it is and has been at all times the aim of the N.Y.A. to supplement industry and the trades with newly trained youth who may serve as apprentices.

As stated by Bell, "... only a small majority of our youth who could be absorbed profitably as apprentices are now indentured. For example, the committee on Vocational Education of the Associated Industries of Cleveland found that there were in 1936, approximately 36,402 skilled workers in ten major crafts and approximately 600 apprentices, would mean a shortage of at least 1,200 apprentices." 13 The reasons for the training of so few apprentices in recent years are manifest. Many industries have worked on partial shifts and some have eliminated certain functions and departments while others have doubled the duties of workers where with a little more effort one man could do with the aid of machinery the work of two or more. With the rapid and vigorous efforts in industry to supply

13 Howard M. Bell, Matching Youth and Jobs, pp. 63-64.
defense machines and materials, there has been a serious shortage of young men qualified to do exacting and skilled work.

Before the N.Y.A. was called upon to assist in training workers on a defense basis, efforts were made by the government to interest young men in necessary industries which had to supply needed defense contracts; a small number responded, so other means had to be used to get youths competent enough to be taken into the plants and taught how to make use of the precision machines.

An example of this was in the manufacture of the newer types of semi-automatic rifles which were adopted by the United States Army. A period of two to four years has been needed to reach production sufficiently high to supply the need.

It is comparatively easy to reach the youth who are in high schools and colleges should the problem become extremely critical and doubtless much can be done by working directly through the schools. The efforts of the N.Y.A. have been toward reaching the youth who are out of schools. This is an entirely different situation. Diagnostic tests must be used in order to be able to classify them, some of whom have finished school and are now unemployed. The majority of them, however, have not finished school for various reasons.

Merely classifying out-of-school youths and placing
them on projects does not solve the problem. Some must be trained in one line and others started at a lower rung of the educational as well as the mechanical ladder. Personal likes and dislikes must be considered as well as local conditions relative to established industries and industrial plants.

Local Projects

The out-of-school work program of the N.Y.A. is at present operating in 2,903 counties out of a total of 3,072 in the United States as well as in certain of the territories. This program not only provides needed work but enables the worker to have wages coming in regularly during the training period. In most cases the youth are from homes in which the addition of even a small income is a big aid to the upkeep of the family. Wages are from $14 to $24 per month; the hours range from a minimum of forty to one hundred per week.

In communities where youth of the out-of-school age are available and an N.Y.A. training center is located, the youths report for work hours and related training periods. In this way they are able to report for work when their time is scheduled and in off times remain available for other employment or work at home or on the farm.

Since the work is being done on a part time basis to enable a larger group to take advantage of the work
experience, the worker during the off days of the week is free to seek other part time employment.

**Resident Centers**

The youth of the resident centers are paid a slightly larger wage scale but certain deductions are made to cover a part of the cost of subsistence.

In the following table, locations, number of youth accommodated, and descriptions of the types of work offered give an insight into the resident center plan of operation. Most of the work offered applies directly to work experience necessary for defense work applicants; varying length of terms applies singly to the individual centers.

There is a total accommodation of 1,385 boys in the various centers with one center for girls only, and a negro center which accommodates 50 boys and 50 girls. These figures and the table do not include any part of the resident centers for girls in the division of N.Y.A. known as homemaking.

Girls from rural areas, which include communities of the county as well as farm homes, make up these projects. Homemaking includes preparation of meals, health studies, nutrition, sewing, room arrangements and ways in which to make living more enjoyable to those not having accommodations equal to city dwellers.

Girls are selected on the same basis as the boys
for resident centers. They live in the N.Y.A. home under a local supervisor for a period of two weeks, then they return to their own homes for two weeks. Upon returning to the residence center reports are made to the supervisor on work and improvements made at home as a result of the N.Y.A. training.

Related training is carried on in these centers and approved courses of study guide this work on a plan similar to that of the resident centers for boys.

"As of December, 1940 there were in operation approximately 600 N.Y.A. resident projects located in 45 states, employing about 30,000 young men and young women, or approximately 10 per cent of the total number on the out-of-school work program at that time." 14 These figures include all phases of work and they are not in any sense limited to national defense training. We are able to see that Texas is well represented by a large number of resident centers, not including those for girls alone. Texas has a total of 15 resident centers compared to the average of 13 1/3 for the 45 states and a total of 14 for girls homemaking resident centers, giving a total of 29 centers, for both boys and girls.

Due to the inaccessibility of some of the non-resident

<table>
<thead>
<tr>
<th>Name of Project</th>
<th>Location</th>
<th>No. Youth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inks Dam</td>
<td>12 miles west of Burnet on Colorado River</td>
<td>375 boys</td>
<td>Auto mechanics, machine shop, electricity*, sheetmetal drafting*, foundry, radio woodworking, printing.</td>
</tr>
<tr>
<td>San Marcos</td>
<td>At Southwest Texas State Teachers College</td>
<td>80 boys</td>
<td>Machine shop*, woodworking*, sheetmetal*, auto mechanics*, carpentry*.</td>
</tr>
<tr>
<td>South Houston</td>
<td>15 miles south of Houston</td>
<td>125 boys</td>
<td>Aviation mechanics*, auto mechanics, cooking*, woodworking, radio.</td>
</tr>
<tr>
<td>Marshall</td>
<td>In Marshall, Texas</td>
<td>150 boys</td>
<td>Woodworking, sheetmetal, machine shop, welding, auto mechanics, aviation mechanics, blueprint reading*, mechanical drawing*, sheetmetal, machine shop*, mathematics*.</td>
</tr>
</tbody>
</table>

*Classes in related information and training offered by local schools and the Vocational Division of the State Department of Education.
<table>
<thead>
<tr>
<th>Name of Project</th>
<th>Location</th>
<th>No. Youth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranger</td>
<td>In Ranger, Texas</td>
<td>150 boys</td>
<td>Aviation mechanics*, machine shop, woodwork, radio, cooking*, sheetmetal, cooking*.</td>
</tr>
<tr>
<td>Woodlake</td>
<td>3 miles south of Groveton, Texas</td>
<td>75 boys</td>
<td>Farm management*, sawmill, farm shop*, cooking, radio.</td>
</tr>
<tr>
<td>Lubbock</td>
<td>At Texas Technological College</td>
<td>50 boys</td>
<td>Farming, stock-raising, dairying, woodwork, farm shop. (farm boys)</td>
</tr>
<tr>
<td>Bastrop</td>
<td>1 mile east of Bastrop, Texas</td>
<td>60 boys</td>
<td>Woodworking, radio. Experienced boys.</td>
</tr>
<tr>
<td>Duncan Field Air Depot</td>
<td>Near San Antonio, Texas</td>
<td>125 boys</td>
<td>Aviation mechanics, clerical, truck driving, cooking*, auto mechanics, blueprint reading*, drafting*, mathematics*, radio*.</td>
</tr>
<tr>
<td>Canyon</td>
<td>At West Texas State Teachers College</td>
<td>100 boys</td>
<td>Aviation*, auto mechanics, sheetmetal, radio.</td>
</tr>
</tbody>
</table>

*Classes in related information and training offered by local schools and the Vocational Division of the State Department of Education.
## TABLE 1--Continued

<table>
<thead>
<tr>
<th>Name of Project</th>
<th>Location</th>
<th>No. Youth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingsville</td>
<td>At A&amp;I College</td>
<td>75 boys</td>
<td>Wrought iron-work, metal-shop, woodwork</td>
</tr>
<tr>
<td>Waco</td>
<td>In Waco, Texas</td>
<td>40 boys</td>
<td>Woodwork, auto mechanics, radio</td>
</tr>
<tr>
<td>Big Spring</td>
<td>In Big Spring, Texas</td>
<td>50 boys</td>
<td>Woodwork, sheet-metal, wrought iron-work</td>
</tr>
<tr>
<td>Blinn College</td>
<td>In Brenham, Texas</td>
<td>60 girls</td>
<td>Stenography*, bookkeeping*, business</td>
</tr>
<tr>
<td>Prairie View</td>
<td>At Prairie View, Texas</td>
<td>50 boys</td>
<td>English*, general office practice*, radio*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 girls</td>
<td>Colored service work.</td>
</tr>
</tbody>
</table>

*Classes in related training offered by local schools and the Vocational Division of the State Department of Education.

Centers to youth of widely scattered communities and the active full-time training permitted in resident centers there exists an extreme advantage to youth permitted to attend these centers.

**Regional Centers**

Due to the success of the resident centers larger areas were classified and organized into what have been designated as regional centers. This latest type of center
attracts youth from the several states comprising the region; only those who have shown unusual aptitude and ability are selected. In the regional center they have the advantage of more technical and specialized laboratory work facilities. This ordinarily applies to mechanical fields. In these centers capable instructors give the youth a chance to develop their talents.

Vocational Guidance

Youth in training in N.Y.A. shops are permitted several types of work to determine what they are best fitted for. Interviews with instructors are necessary and often are the best means of classification, especially in those cases where the applicants have had practical experience in fields in which training is offered. This also permits active records to be kept of the particular work being done and is an assistance to the youth in making use of the employment service.

To aid and assist youth as well as instructors many occupational and industrial studies have been made available. Since these studies are in a published form they are often a part of the related training classwork, and many libraries have stocked them for the benefit of prospective N.Y.A. applicants.

"All training or educational programs for youth employed by N.Y.A. on work projects shall be under the control and
supervision of the state boards of vocational education of the several states." 15 With the Texas state board of vocational guidance, a division of the State Department of Education, at the helm of the related training or classroom supervision, the theory of this related training program has available to it the best in vocational guidance, and the efforts are directed toward placing the N.Y.A. youth in the best available industrial work for which the one year or less of training may prepare them.

"The time for related instruction in the present defense training is so limited that the job is to direct an encourage trainees in self study." 16 With out-of-school groups a program of study of the theory dealing with shop practice is rather difficult but much of the theoretical background is being taken from the related subject matter, and learning the more practical work which applies directly to the work project at hand.

In the Ford Trades schools of the Ford Motor Company at Dearborn, Michigan, textbooks have been composed from job-sheets and work-sheets formerly used in the schools. Patently in skilled tool making and parts making in an automobile plant, certain mathematical knowledge is

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necessary so the schools have deleted the theoretical matter and assembled the necessities of mathematics, notably applied Geometry. In this way the youth in school is able to cover the work more quickly. By accepting the theory as proved and emphasizing method, time is saved.

Since the N.Y.A. program of work experience for defense preparation has uncovered some of the fallacies in youth training, it has at the same time tried to alleviate these shortcomings some of which may explain why work experience has never entered into the functioning of our schools and why youth has often left school before graduation. Unfortunately some youth have felt that graduation was no useful goal; moreover, many could not see that further schooling was of any economic value to them. The situation as discovered in this study has brought to light the evidences of the gap between school and employment.

With adequate vocational guidance more youth in the future will be able to better prepare themselves for employment, whether it be industrial, clerical or professional.

"One element in the process of transforming a youth into a producing member of society is work experience. For practically everyone born in the United States it is necessary to earn a living in some sort of productive
work. 17

N.Y.A. Planning and Sponsorship

In the establishment of the present N.Y.A. program it was necessary to provide for future work. Federally supported, such projects to provide for community betterment had to be in close contact with the community. For this reason each division of the N.Y.A. must be sponsored by some public institution, preferably the public school system. Sponsored shop work can be given in communities where colleges are located. In addition to promoting student N.Y.A. jobs they have established shops, provided one or more instructors, and the work done is at the insistence of the public agencies. For example, school equipment, local library equipment and any project within the scope of the shop for public agencies is available.

Since the advent of N.Y.A. into the defense program, extensive plans have been made through the cooperation of engineering, technical, and trades schools. In these schools out-of-school youth can be trained in the use of machines and machine operations whereby they are able to obtain an intensive course which will enable them to be ready for jobs in airplane manufacture, ship building.

ordnance and munitions, electrical and radio work.

It is the duty of the sponsoring agency to insure the offering of courses that will dovetail with the industries that are locally important, so that youths at the end of their training can remain at home and benefit their communities which have aided in providing this educational training field for its youth.

Health

During the year 1941, a program was launched to improve the physical fitness and general health of all youth employed in the N.Y.A. out-of-school program. This health program has three major objectives:

1. A physical appraisal, by means of a technically competent health examination, of every youth assigned to the N.Y.A. out-of-school program.

2. Correction of health defects through utilization of community resources, through use of supplementary medical and dental services provided where possible by the N.Y.A., and through developing in youth an interest in improving health by their own personal efforts.

3. Improved technical advice and assistance with respect to all N.Y.A. efforts having a direct and immediate bearing on the health of youth workers, such as nutrition, sanitation, physical development and recreation. 13

With a large majority of rural youth making up the rolls of the N.Y.A. classes, and the common knowledge of lack of improvements for sanitation on most farms and farm communities, it is of great importance that a health program be sponsored. Many homes will benefit directly from knowledge gained by the youth and their application of it on their return to their homes. Nutrition is valuable to the youth since many have not been able to have balanced diets in poorer homes. To do the best work, both physically and mentally, balanced and nutritive diets are necessary for youthful bodies.

In the defense sections of the N.Y.A. little time is given to health study and problems of the home while much is given in girl resident centers. The work is strictly on a corrective basis in defense centers, as it is mostly government supervised in camps, centers, and institutions, and the health conditions improve noticeably several months after operation has begun.

Defense Needs

Table 2 lists certain defense needs and whether or not they are being offered by the agencies. Of the ten given defense needs, nine are being taught in N.Y.A. schools, seven are taught in the National Defense Training Program schools, and seven are taught in the colleges. In six colleges, it is found that five are teaching three
TABLE 2
THE DEGREE TO WHICH GIVEN DEFENSE NEEDS ARE TAUGHT
BY N.Y.A., NATIONAL DEFENSE TRAINING SCHOOLS
AND TEACHERS COLLEGES

<table>
<thead>
<tr>
<th>Defense Needs Taught</th>
<th>Agencies</th>
<th>Defense Schools</th>
<th>Teachers Colleges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N.Y.A.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto Mechanics</td>
<td>Yes</td>
<td>Yes</td>
<td>One</td>
</tr>
<tr>
<td>Sheet Metal</td>
<td>Yes</td>
<td>Yes</td>
<td>One</td>
</tr>
<tr>
<td>Aviation Mechanics</td>
<td>Yes</td>
<td>Partially</td>
<td>No</td>
</tr>
<tr>
<td>Radio</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Woodworking</td>
<td>Yes</td>
<td>Yes</td>
<td>Five</td>
</tr>
<tr>
<td>Electricity</td>
<td>No</td>
<td>Yes</td>
<td>Two</td>
</tr>
<tr>
<td>Machine Shop</td>
<td>Yes</td>
<td>No</td>
<td>Five</td>
</tr>
<tr>
<td>Cooking</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Carpentry</td>
<td>Yes</td>
<td>Yes</td>
<td>Two</td>
</tr>
<tr>
<td>Welding</td>
<td>Yes</td>
<td>Yes</td>
<td>Five</td>
</tr>
</tbody>
</table>

needs, two are teaching two needs, two are teaching one of the needs, while three teach none of them. While the college curriculum was not set up for the purpose of teaching defense training, it meets these needs very well.

The courses needed by youth who wish to enter defense industrial plants at the present time are: auto mechanics, sheetmetal, aviation mechanics, radio, woodworking, electricity, machine shop, carpentry, and welding. As seen
in Table 2, these needs are being met by the N.Y.A.,
the National Defense Training Program and the industrial
arts departments of the colleges in varying intensity.

No one youth need have a working knowledge of all
these fields to be available as a defense industry worker,
yet there is enough variation in courses that most every
youth can be prepared to fill some need in industry.

The way in which the agencies and the teachers colleges
are fulfilling or failing to fulfill the demands of the
defense objectives is shown in Table 2. Since the three
agencies are together covering the entire list of objec-
tives, the in-school youth and the out-of-school youth
alike are being made ready for defense industry absorption
should they desire this employment.

Negro youth in this state are not being trained as
skilled workers but for domestic work. Owing to a lack
of educational facilities and a strong racial feeling
against them, they have not been placed in industrial
work along with the white workers.

Table 3 is a graphical arrangement of the National
Youth Administration set-up for Texas. The State Youth
Administrator is at the head with the State Advisory
Board and the State Advisory Committee functioning under
him. Each division of work is responsible to a Deputy
State Youth Administrator who also supervises the State
TABLE 3

THE NATIONAL YOUTH ADMINISTRATIVE SET-UP FOR TEXAS

STATE YOUTH ADMINISTRATOR

STATE ADVISORY BOARD

SPECIAL ADVISORY COMMITTEE

DEPUTY STATE YOUTH ADMINISTRATOR

STATE HEALTH CONSULTANT

OFFICE OF NEGRO AFFAIRS

STATE PERSONNEL OFFICER

INFORMATION AND REPORTS

WORK PROJECT DIRECTOR

YOUTH PERSONNEL DIRECTOR

STUDENT WORK RELATED TRAINING DIRECTOR

FINANCE AND STATISTICS DIRECTOR

FIELD REPRESENTATIVE

AREA DIRECTORS
Health Consultant, the Office of Negro Affairs, the State Personnel Officer, and the department of Information and Reports. Contacting probable and prospective enrollees are field representatives and area directors who are directly over the instructors of the schools.

Summary

The National Youth Administration was set up with the aims of giving the out-of-school youth work experience and employment at the same time. At the beginning of it the need for youth training for defense industry was not foreseen. The situation has become so vital that youth have been needed to supply additional semi-skilled and skilled workers. As events proved, the N.Y.A. was the logical place to look for such workers.

No attempt has been made to displace skilled workers but simply to supply additional workers and to retrain those workers who had been forced out of work by the depression and to train unemployed youth who were out of school.

To accommodate youth in all localities, local projects, resident centers, and regional centers have been established. Local projects include only the youth of the communities served by the N.Y.A. training shops. Resident centers serve those youths from communities in which there are no local projects and no shop work; they are housed and fed at these centers. Regional centers take care of
the more advanced workers and train them in specific skills for particular industries. Additional regional centers are being established in order to increase the supply of youth in vital defense industries not heretofore requiring them.

In December 1940, in 45 states there were 600 N.Y.A. resident projects in operation. In Texas there were a total of 29 resident projects for both boys and girls. With this number of centers for youth training, Texas had over twice as many training centers as the average for all the other states.

Related training or classroom work was being done in a number of phases of youth education. All educational material was being supervised by the Texas Vocational Board which is responsible to the United States Office of Education.

An approved course of study adequately supervised by the instructors supplements the shop work being done. While some work does not require related training, it has done much to aid youth in finding private employment. Records are kept on all project work and information is supplied to the State Employment Service on all N.Y.A. youth upon the completion of their training program.

Youth are afforded valuable training by the N.Y.A., the cost of which is born by the federal government and the local communities. The N.Y.A. also affords a vast employment service which makes necessary contacts and has placed a large number of its trainees in private industry.
CHAPTER IV

AN ANALYSIS OF THE NATIONAL DEFENSE TRAINING PROGRAM

History

During the summer of 1941, through the United States Office of Education, a fund of $15,000,000 was set up for allotment from time to time as was deemed necessary to the several states of the United States to finance, "... vocational courses supplementary to employment in occupations essential to National Defense and pre-employment refresher courses for workers preparing for such occupations." 19

The training period was to be implemented by installation of necessary equipment where none was available in the vicinity. In many cases, the machines and tools of high school and college industrial arts shops were used. Working time was arranged in a manner to avoid conflict with existing schedules in such schools. Vacant buildings in many instances were easily obtained and equipment purchased through a federal fund of $8,000,000 for National Defense Training shops. Local instructors were hired when possible and efforts were made to induce rural and non-rural youths to enroll in this

field of defense endeavor.

The Commissioner of Education handed down several decisions with reference to purchase of shop equipment and materials and made this delegation to the state. "In line with this delegation of power the Commissioner has ruled that title to equipment purchased from funds appropriated by this sub-division may be held by the appropriate State Board of Vocational Education or by the local school boards, in the latter case the local board must agree to make this equipment available for use at the discretion of the state board during the time of need for defense training." 20

This method of obtaining machines and tools, welding equipment, and other materials has enabled small schools to use this same equipment in their classwork during the time the defense program trainees were not in classes. They are then able to keep such machines and equipment so long as they hold it ready for defense purposes.

Objectives

The Defense Training Program was begun in an effort to supplement the small number of youth entering those industrial plants furnishing needed defense materials. This method has been chosen by the federal government.

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chiefly for the reason that these plants have no facilities to install such a training program and a dire need for workers has existed.

The objectives of the National Defense Training Program have been given by John W. Studebaker as follows: "First, to retrain, at least partially, workers who have lost their skills during the depression years; second, to train those already employed in industry for more advanced and skilled work; and third, to begin to prepare older youth and young adults in the cities and on the farms to participate in the industrial phases of National Defense." 21

Most cities and communities have instituted some type of shop work for defense training under the above objectives. In many cases the enrollees of some of these defense shops could not hope to enter industrial plants without more specialized training since some of the courses are not at all applicable to industry but more applicable to agriculture and farm shop practice. Even so to make youth better prepared to do any type of work that is productive is a defense measure.

With the widespread interest exhibited by youth for industrial training, most of the farm organizations in the nation began to clamor for attention to the needs of rural youth. Accordingly there was appropriated another fund,

some $10,000,000, "... for the education and training of out-of-school youth of rural and non-rural areas as defense workers." 22 This appropriation has enabled many more youth, especially farm youth, to make themselves into better trained and educated workers.

Courses approved by the Division of Vocational Agriculture and the State Department of Education of Texas were:

Operation, care, and repair of tractors, trucks and automobiles (including both gas and Diesel engines).

Metal work, including simple welds, tempering, drilling and machinery repair.

Woodworking, including carpentry and use of power driven woodworking machines.

Elementary electricity, including operation, care, and repair of electrical equipment.

Agriculture.

Pre-Vocational training.

"It is recognized that further definition of the term 'occupations essential to National Defense,' is the responsibility of the Advisory Commission. They have the approval for vocational training purposes a list of industries and industrial fields in which essential defense occupations are furnishing a rough limitation of the fields in training may

be needed." 23 The list of such industries is given below.

"Aircraft - manufacturing, maintenance and repair.
Machine tools.
Shipbuilding - manufacturing, maintenance and repair.
Automotive - manufacturing, maintenance and repair.
Electrical.
Forging.
Boiler and heavy plate.
Foundry.
Light manufacturing (essential occupations only).
Sheet metal.
Woodworking (essential occupations only).
Chemicals.
Ammunitions.
Ordnance, light and heavy." 24

These industries have become so essentially defense manufacturing that many new National Defense Training schools have in larger cities incorporated within their course of study work which has enabled the trainees to become workers with little or no additional training upon completion of such applied courses.

"A significant aspect of the administration of the defense program has been the development of cooperative

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24 Ibid., p. 234.
relationships with other public agencies. The determination of joint procedure and policies have had to take place on a large scale with the United States Employment Service and Works Progress Administration, since these agencies constitute the source of trainees for the pre-employment refresher courses." 25

Within a period of some twenty three years of experience in administering federal aid for vocational education throughout the United States, the United States Office of Education has been able through its many representatives and contact men to extend aid and gather material to be used in the defense work. Moreover, with the aid of both the W.P.A. and the United States Office of Employment through its many state branches the United States Office of Education has been able to direct many youth toward defense schools and defense jobs upon completion of certain work.

The Texas State Employment Service operates in close connection with all federal agencies and it has aided in the employment placement of many youth upon completion of defense training programs.

"The administrative policies of the Office of Education with regard to defense training have evolved with two related objectives in mind:

1. Within given areas the expansion of the nation's

25 Ibid., p. 234.
available labor supply to meet the immediate demand for workers in specific occupations essential to National Defense;

2. The development of proceedings in administration and instruction, which would give force to the labor supply objective." 26

In these efforts work-sheets and courses of study have been made available to the instructors to enable them to present in simplest forms yet with clarity the working out of problems and skills for the youth. As in the N.Y.A. program of defense, related training or classroom work is necessary to supplement the shop courses, since in all study courses certain printed matter is essential if best results are accomplished.

Youths completing the schooling of the National Defense Training Program have been somewhat handicapped thus far since they have not been able to advance as far as groups from certain of the N.Y.A. schools. This has been taken care of by industrial plants where the workers are to be employed; a period of further training is given, generally of thirty to sixty days and upon completion of this training they are qualified to begin work in such industries as aircraft production. This industry of aircraft production is

26 Ibid., p. 234.
absorbing most youths in Texas at present. With the completion of ship building plants on the Gulf Coast in the near future, many youth will be needed to fill the ranks of skilled and semi-skilled workers along with adults.

Safety of the youth while in defense schooling is being taught and definite safety measures are prescribed in the use of machines and welding equipment. Many features of these safety measures will be carried back to the home and farm by youth not going on into defense industrial work and will be of value in every day work.

Little effort in National Defense Training Program shops has been applied toward work on project production basis since it has been the skills that have been taught. In some of the recent shops set up on a large scale dealing strictly with machine shops, machine operations, and tool making, work on a production basis is necessarily of value in order to be able to turn out finished products as quickly as possible. Speed is one of the objectives of the defense program in order to successfully prepare the nation should there be imminent danger of invasion.

With the bringing of the rural youth into shops for defense training, many of whom have had incomplete high school educations, most of them have gained useful knowledge from the related subject matter and technical skills. Although the time for training is short, many will have a
start for a well-rounded and well-balanced future. The knowledge that a youth is able to compete with others and to hold a job gives a better outlook for the future which greatly contrasts with the hopeless attitude toward the world at large of unemployed youth.

The ancient philosophy of the Jews was expressed with this maxim, "Teach your son a trade, lest ye teach him to be a robber." The prevalence of this philosophy has been seen down through the ages; the Jewish race has been unable to settle for long, many nations have punished and outlawed them, but they knew how to establish themselves in new surroundings and the majority of them apparently prosper. This likewise applies to youth of today. With knowledge of a skill they are able to make new standards of living for themselves and to adapt themselves to changes in our economic life.

The following table demonstrates how the National Defense Training Program has appealed to the youth of Texas. There is an increase of approximately 7 per cent in enrollment, of approximately 50 per cent in employment, the establishment of 4 new training centers, and applications for centers of a total of 333 on June 1, 1941.

The time limit for the expiration of the National Defense Training Program was July 30, 1941, it having operated for an original period of six months. Plans and
### Table 4

**Increased Growth Over a 60 Day Period of All Classes of National Defense Training Programs with Numbers Now in Private Employment**

<table>
<thead>
<tr>
<th>Factors</th>
<th>April 1, 1941</th>
<th></th>
<th>June 1, 1941</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>white</td>
<td>colored</td>
<td>total</td>
<td>white</td>
</tr>
<tr>
<td>Training Centers</td>
<td>228</td>
<td>57</td>
<td>285</td>
<td>231</td>
</tr>
<tr>
<td>New Courses</td>
<td>783</td>
<td>128</td>
<td>911</td>
<td>905</td>
</tr>
<tr>
<td>Enrollment</td>
<td>14,017</td>
<td>3,215</td>
<td>17,232</td>
<td>18,646</td>
</tr>
<tr>
<td>Number Drafted in Employment</td>
<td>653</td>
<td>9</td>
<td>662</td>
<td>1,196</td>
</tr>
<tr>
<td>Applications for Additional Training Centers</td>
<td>225</td>
<td>75</td>
<td>300</td>
<td>248</td>
</tr>
</tbody>
</table>

appropriations are underway for a period of twelve months training during 1941 and 1942. It is estimated that the new program will be started on or about September 1, 1941. Supervisors have been called to conferences during August 1 and 2, 1941, to make plans for the new twelve month period of training.

**Summary**

The limited time in which the National Defense Training Program has been in effect has not made it possible to reach a very large number of youth. Many prospective trainees have been unable to enroll for various reasons.
Enrollees have attended to June 1, 1941, 905 courses of instruction in the following phases of defense training: auto mechanics, metal work (welding, tempering, drilling, and machine repair), woodworking, electricity, agriculture, and pre-vocational training.

There are at present 231 white and 53 colored shops.

There have been 248 white and 35 colored applications for additional training centers, and 111 white and 23 colored new shop buildings constructed.

Plans are underway for a twelve months extensive training program of the National Defense Training Program for 1941 and 1942. This new period is scheduled to start early in the fall of 1941, perhaps about September 1.
CHAPTER V

AN ANALYSIS OF THE TEACHERS COLLEGES OF TEXAS:

INDUSTRIAL ARTS DEPARTMENTS

Industrial Arts in the Colleges

There are seven state owned and operated teachers colleges. Their names and locations are: Sul Ross Teachers College at Alpine, Texas; Sam Houston Teachers College at Huntsville, Texas; the Southwest Teachers College at San Marcos, Texas; the East Texas Teachers College at Commerce, Texas; the West Texas Teachers College at Canyon, Texas; the North Texas Teachers College at Denton, Texas; and the Stephen F. Austin Teachers College at Nacogdoches, Texas. Of these colleges, six are offering work in departments of industrial arts. This work varies widely with each school; no two offer the same number of courses or use the same classification of work. The offering of courses at each college is largely controlled by the demands of the student body from year to year and the geographical location. Consideration must be given to the size of the state of Texas, location of industries, its oil fields, its ranches and other forms of livelihood as all of these factors enter into making up the curriculum. The curriculum of each college is formulated with the larger purpose of preparing its students with the
necessary skills demanded by industry and business in the particular locality.

Industrial arts may be defined as that phase of general education pertaining to the formation of skills in general shop courses. Industrial arts differ with other curricula courses in that it becomes necessary for the student to be able to correlate the skills of manual activities with the processes learned either from experience perception or related training of printed classroom instructions. This particular phase of education is traced back to the early teachings of such educators and philosophers as Pestalozzi and Rousseau. Both of these educators believed that the way in which to begin the education of a child was to show the value of work with the hands at the same time as mental training was being given. We therefore think of Pestalozzi especially, as the father of industrial education.

To become proficient in industrial arts work one must become proficient in several fields, namely, woodworking, metal working, mechanical drawing, blueprinting, design, and student technique.

"The prospective industrial arts major must face the necessity for preparation in a variety of subject areas, such as, woods, metals, and the like, and must acquire what approaches a journeyman's skill in the processes
involved." 29

"In the evaluation of industrial arts education, the
discovery has been made that it possesses unlimited possi-

bilities in the direction of making a well-rounded, well-
balanced human being." 30

Many school systems have turned to the field of indus-
trial arts for the selection of principals and adminis-
trators since it has been shown that the associations of
teacher and pupils through the shop have so broadened
teachers that they are better able to handle the problems
of students more effectively and satisfactorily.

Industrial Arts and National Defense

With the exception of those colleges wherein N.Y.A.
and National Defense Training Programs have been incor-
porated in the curriculum, there has been no direct con-
nection between defense and industrial arts, but indi-
rectly this department is naturally supplementary to the
industries and the skills now so essential to youths
planning to go into jobs on the defense front. No other
part of the curriculum has the background for skills so
useful to the industries. No other department teaches

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29 L. F. Ashley, "Leaving the Crossroads in Teacher
Education," Industrial Arts and Vocational Education
Magazine, XXVII (September, 1933), p. 267.

30 D. M. Schwieckhard, "Progressive Industrial Arts,"
Ibid., p. 269.
<table>
<thead>
<tr>
<th>Activities</th>
<th>OSY (W)</th>
<th>OSY (C)</th>
<th>NYA (W)</th>
<th>NYA (C)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Training Centers</td>
<td>231</td>
<td>56</td>
<td>14</td>
<td>9</td>
<td>312</td>
</tr>
<tr>
<td>Number of New Courses (Swks)</td>
<td>905</td>
<td>194</td>
<td>42</td>
<td>21</td>
<td>1162</td>
</tr>
<tr>
<td>No. Continuation Courses (Swks)</td>
<td>494</td>
<td>151</td>
<td>44</td>
<td>28</td>
<td>717</td>
</tr>
<tr>
<td>Enrollment by courses: Courses:</td>
<td>312</td>
<td>20</td>
<td>11</td>
<td>0</td>
<td>343</td>
</tr>
<tr>
<td>A-1 Operation, care, and repair of tractors, trucks, and automobiles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(including both gas and Diesel engines) Enrollment:</td>
<td>5340</td>
<td>358</td>
<td>192</td>
<td>0</td>
<td>5890</td>
</tr>
<tr>
<td>A-2 Metalwork, including simple welds, tempering, drilling, and machinery repair</td>
<td>347</td>
<td>53</td>
<td>12</td>
<td>2</td>
<td>314</td>
</tr>
<tr>
<td>Woodworking</td>
<td>4005</td>
<td>927</td>
<td>239</td>
<td>20</td>
<td>5341</td>
</tr>
<tr>
<td>A-3 Woodworking</td>
<td>340</td>
<td>123</td>
<td>28</td>
<td>19</td>
<td>510</td>
</tr>
<tr>
<td>A-4 Elementary electricity</td>
<td>6476</td>
<td>2262</td>
<td>633</td>
<td>367</td>
<td>9738</td>
</tr>
<tr>
<td>including operation, care, and repair of electrical equipment</td>
<td>79</td>
<td>15</td>
<td>4</td>
<td>0</td>
<td>98</td>
</tr>
<tr>
<td>A-5 Agriculture</td>
<td>1217</td>
<td>247</td>
<td>95</td>
<td>0</td>
<td>1559</td>
</tr>
<tr>
<td>A-6 Pre-Vocational Training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. placed in employment</td>
<td>1196</td>
<td>93</td>
<td>39</td>
<td>5</td>
<td>1333</td>
</tr>
<tr>
<td>No. of applications for additional training centers</td>
<td>248</td>
<td>85</td>
<td>12</td>
<td>6</td>
<td>351</td>
</tr>
<tr>
<td>TOTAL ENROLLMENT OF COURSES:</td>
<td>21,747</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Data by State Department of Education*
skills of a nature which permit youths to go from college classes into factories and satisfactorily take over jobs on the basis of college training.

In Table 6 are listed "given defense needs" and those needs the industrial arts departments of the teachers colleges are offering; also there is listed the regularly scheduled classwork now offered in these colleges.

Since Table 6 shows how well students who have completed industrial arts courses may meet the demands of the defense industries for trained workers. In the automobile industry now greatly devoted to defense machines, such as tanks, airplanes, guns and parts manufacture for other phases of defense, "over 4,800 new workers per month" are being absorbed. 31

In the electricity and radio industry, "advance estimates show that a minimum of 75,000 new workers will be hired during the last half of 1941." 32 Thus if numerous colleges in the United States have departments of industrial arts, and if these colleges have been offering vital defense subject matter, many student and graduate workers will be ready to go into industrial jobs such as these.

Industrial arts departments have been especially valuable to the defense mechanism as a source of instructors in


32 Ibid., p. 15.
<table>
<thead>
<tr>
<th>No. of Colleges Offering Courses</th>
<th>Courses Offered</th>
<th>Defense Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five...</td>
<td>Machine shop operations</td>
<td>Ordnance, aircraft, tool making</td>
</tr>
<tr>
<td>Five...</td>
<td>Metal work (hot and cold)</td>
<td>Boiler plate, shipbuilding, auto and tanks</td>
</tr>
<tr>
<td>Six...</td>
<td>Woodworking</td>
<td>Pattern making, models, aircraft</td>
</tr>
<tr>
<td>Three...</td>
<td>Foundry</td>
<td>Tank, auto, truck, aircraft, castings and stampings</td>
</tr>
<tr>
<td>Three...</td>
<td>Sheetmetal</td>
<td>Aircraft, shipbuilding, armament, automobiles</td>
</tr>
<tr>
<td>Five...</td>
<td>Electricity</td>
<td>Shipbuilding, aircraft, communications</td>
</tr>
<tr>
<td>Six...</td>
<td>Mechanical drawing</td>
<td>Drafting, blue-printing</td>
</tr>
<tr>
<td>Three...</td>
<td>Printing</td>
<td>Bulletins, bonds, selective service, details and information</td>
</tr>
<tr>
<td>Two...</td>
<td>Farm shop*</td>
<td>Trucks, autos, tractors, repairs and maintenance</td>
</tr>
<tr>
<td>Three...</td>
<td>Carpentry</td>
<td>Shipbuilding, barracks, cabinet makers</td>
</tr>
</tbody>
</table>

* under Agriculture.
the several training agencies, for unlike industrial workers and mechanics they have had particular instruction in teaching technique and many of them have been able to follow the teaching techniques of their high school and college instructors. Many of them are at once placed as instructors and supervisors.

The industrial arts departments, like certain phases of the N.Y.A. and the National Defense Training Program, have been offering some work not applicable directly to defense work. The colleges have not been called upon to direct industrial arts courses directly into defense channels. As already mentioned, this department is the only one in which the major part of the regular program falls into the category of youth preparation for defense work of an industrial nature. This natural correlation has allowed many youths to enter into factories for defense preparation with little or no additional training if they have completed most of the college courses leading to a major or minor requirement for a degree in the industrial arts department.

Many youths who have had some courses in industrial arts, though not yet through with their school work, were among the first to be chosen for the training classes of the N.Y.A. and the National Defense Training Program for out-of-school youth.

In the six out of seven state teachers colleges offering industrial arts, a total of 103 courses are given. The
TABLE 7

COURSES IN INDUSTRIAL ARTS OFFERED IN 1940 BY
THE TEXAS STATE TEACHERS COLLEGES TOGETHER
WITH THE NUMBER OF CLASSES AND COURSES
OFFERED

<table>
<thead>
<tr>
<th>Courses Offered</th>
<th>No. College Classes</th>
<th>No. Colleges Offering Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bench Woodwork</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Bench Metal</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Sheetmetal</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Drawing</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Advanced Metal (Machine)</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Printing</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Linotype Operation</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Machine Drafting</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Wood Carving</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Book Binding</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Topographical Drawing</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Advanced Machine Woodwork</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>General Shop (methods-problems)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Furniture Design</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Project Drafting</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Teaching Methods</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Philosophy of Ind. Arts</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Supervision of Ind. Arts</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lettering</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Engineering Drafting</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Electricity</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Farm Shop*</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Carpentry</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Auto Mechanics</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Foundry and Welding</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Construction of Shop Tools</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Home Planning</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Crafts</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>History of Ind. Arts</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Wood Technology</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Descriptive Geometry</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Design</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sheetmetal Drafting</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Vocational Guidance</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Civilian Pilot Training</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* under Agriculture. Total 103
mean number of courses is 2.7, this figure denotes an average of 2.7 of all courses of each type making up the department curriculum. The mean number of colleges offering all courses is 2.3.

Offering the 103 courses there are 18 teachers. This gives to each teacher approximately 5 1/16 courses; however, there is an undisclosed number of student assistants and tutors who are handling some of the courses. Of these 18 teachers and instructors there is one with a Ph. D. degree, nine with M. A. degrees, five with Bachelor degrees, and no teacher having less than a bachelor's degree.

In a study of courses offered which were vital to the training of defense workers, it was found that the six colleges offered the following courses:

- five offered machine shop
- six offered woodworking
- three offered sheetmetal
- six offered mechanical drawing
- two offered farm shop
- five offered metal work
- three offered foundry
- four offered electricity
- three offered printing
- three offered carpentry.

No one college offers all of the above courses except those of woodworking and mechanical drawing. For applications to defense needs see Table 6. A mean offering of all courses in each college is four courses.

Students majoring in industrial arts are required to take a minimum of 34 semester hours in this field. Most colleges advise and permit students to take from 30 to 40 hours of industrial arts. Primarily the college work has
been preparatory to teaching rather than employment in defense industries. Trying to cope with defense measures and at the same time preparing for the industrial jobs available, the departments were well filled during the long term of 1940 and 1941.

With students majoring in industrial arts it is found in this study that they have much longer periods of actual shop training and instruction. With this training and the other required work of the curriculum, such students are in a position to advance once they have a job in an industrial plant. The continued improvement of educational facilities in the colleges places these students in a position to demand more than the out-of-school youth trained in the N.Y.A. or the National Defense Training Programs.

Should the state teachers colleges of Texas be called upon to aid in defense training by specialized courses pertaining to specific industry training? It is likely that provisions could be made whereby additional courses could be added to the curriculum or substituted for existing ones. In this way more students might be influenced to take new courses directly applicable to defense industry training if certain college requirements were waived.

Summary

Of the seven Texas state teachers colleges, six offer courses in industrial arts. A total of 103 courses is
offered with 18 full time teachers and an undisclosed number of assistants and tutors to aid in shop laboratory and classwork.

It so happens that those colleges nearest to the recently constructed airplane and bomber plants, and proposed sites for others, have offered the largest number of courses. These centrally located colleges also offer courses most vital to the students entering these plants for employment. Such courses are: machine shop, metal work (hot and cold), woodworking, foundry, sheetmetal, electricity, mechanical drawing, printing, farm shop, and carpentry.

With the natural correlation of industrial arts training and defense industry preparation, the teachers colleges are in a position to train many prospective workers for defense. With the industrial arts departments being the only part of the curriculum able to give satisfactory training to industrial defense workers, these departments in the colleges should gain greatly in the number of enrollees during the present world crisis.
CHAPTER VI
SUMMARY AND EVALUATION

The aim of the youths employed by the National Youth Administration, the National Defense Training Program, and a large per cent of the college industrial arts students, is to secure jobs in private industry.

As originally established, the aim of the N.Y.A. was to supply youth with work experience thereby making youth more employable. In order to aid in the unemployment situation efforts were made to keep the youth on the rolls of N.Y.A. programs as long as possible but not exceeding a maximum time of one year. Full time employment was not the aim, but to employ youth three or more days per week, with a small salary to compensate for the time spent on projects and to aid in the support of needy families.

Vocational training has been carried out by the N.Y.A. to the extent that each youth is permitted a choice in work projects and try-outs are given in order to find the field in which interest and aptitude are most applicable.

Since the need for skilled workers has become so vital to defense industries in order to adequately defend the United States against a foreign invasion, no effort has been spared to prepare youth in the shortest time possible.
to take employment in defense industries.

Instead of having all part time jobs, many youth have left their homes to be housed and fed in resident centers and regional centers where full time jobs and training programs are given. In these centers special equipment and instruction are available, and youth having natural aptitudes and interests in specific skills are trained in the shortest time possible.

Since one of the chief needs of defense is production in the ordnance and munitions manufacture, skilled operators are needed for lathes, turret lathes, grinders, drills, shapers and polishers. Recently established schools, some of which are not yet completed, are training all available youth and placing them as soon as possible in private industry. They have been trained as machine shop operators and are able to operate machinery and make all kinds of tools.

Engineering schools are under construction also, and many of them will soon be able to supply men to be used as supervisors and instructors in mechanical fields of industry.

With the establishment of airplane and bomber factories in Texas and throughout the Southwest, many of the trained youth have gone into immediate employment in these factories. In some instances it has been necessary to give to some of those youth trained by the agencies an additional period of specific training so that they can be efficient workers in
these factories. Welding, riveting, and sheetmetal training have absorbed a large per cent of youth destined for employment in airplane plants.

In centrally located cities near large industrial centers, efforts are being made to direct virtually all of the training toward supplying defense plants with trained youth as skilled or semi-skilled laborers.

The National Defense Training Program has been operated on a six months period which expired on July 30, 1941. There will be an extension of this program on or about September 1, 1941 for a twelve months period.

The National Defense Training Program was established to serve rural and non-rural youth. It was designed to provide short intensive training in occupations in which labor shortages were acute. Training in most courses lasts for eight weeks; however, some courses run for only four weeks.

Courses studied in the National Defense Training Program are: operation and care of automobiles, trucks, and tractors of both gas and Diesel types, also metal work, drilling and machinery repair, woodworking including carpentry and construction details, electricity including care, operation and the repair of equipment.

Youth satisfactorily completing these courses, or at least some of them, are eligible to go into specified
training centers where they are given more specific and skilled work to prepare them to enter defense industry. Courses in advanced skills have the approval of the industries as well as that of the National Defense Advisory Council.

The teachers colleges' programs do not serve as a defense training agency. However, by virtue of the type of training offered they serve as a means of defense training. Metal work, machine shop practice and training, mechanical drawing, woodworking, and sheetmetal are the basis of the industrial arts program in the colleges, and likewise these same subjects form the groundwork for the defense training courses.

There are seven state teachers colleges in Texas. Six of them offer industrial arts in the curriculum. There are no requirements of standardization of curricula in the various colleges; this study has brought out a great variation of courses and techniques and their application at the separate colleges.

Students majoring in industrial arts are required to take a total of 34 semester hours in the field. It is advised that 30 to 40 semester hours be taken in order to familiarize the student with all phases of the work. A student with knowledge of general shop work also knows the preparation and work in the fields of wood, metal, drawing,
and crafts. Unlike other departments where only one field of endeavor is covered, a well-balanced, well-rounded individual is the result.

Many administrators and supervisors are being chosen from the schools in the department of industrial arts because of the practical slant of such teachers and their superior ability in the handling of students resulting from their shop associations.

In this study the writer has endeavored to show the extent to which the defense agencies of the government and the teachers colleges have aided in youth training and preparation for defense industrial jobs. The manufacture of war materials is so vital at the present time and the necessary workers must be had. The work experience programs have aided in employment of out-of-school youth for defense. The adaptability of the youth trained in the industrial arts departments of the teachers colleges for defense industry jobs is very outstanding.

Evaluations

There are some 20 odd million youth between the ages of 16 and 24 in the United States. The cooperation of the schools and the agencies of the government offers a large percentage of these youth a means of training so that they can gain profitable employment. Also they gain work experience which is valuable to the defense industry program
and thereby become valuable assets to their country rather than dependent liabilities.

During the past fiscal year ending June 30, 1941, a maximum of 25,000 out-of-school youth were employed by the N.Y.A. work experience projects in Texas. In the 45 states where the N.Y.A. operated, some 2,903 of the 3,072 counties took part and some 30,000 out-of-school youth were absorbed by 600 work experience resident projects. In the year from July 1, 1939, to June 30, 1940, 705,000 youths were employed in N.Y.A. work experience projects.

In the six months period ending July 1, 1941, the National Defense Training Program in Texas operated a total of 233 training centers for youth. There were 333 applications for additional training centers from communities not served by those already established. At the end of this period, 23,050 out-of-school youth were trained, approximately 75 per cent of these were rural youth. New courses instituted after the programs began totaled 1,009. The total number of youth placed in private employment by June 1, 1941, was 1,283.

The college industrial arts departments offered 103 courses during the past year and many of them were applicable to defense training. Although only six of the seven teachers colleges offered this program and served less than 2,000 youth, this study has shown the vast possibilities that
could be gained through greater cooperation of the teachers' industrial arts departments and the government defense programs.

The N.Y.A., the National Defense Training Program, and the Teachers' College Industrial Arts departments have all been effective in training and supplying youth to vital defense plants where labor shortages are acute. The value of short intensive training periods cannot be overestimated as they not only supplement but often supplant long apprenticeships in industrial training. With the acute importance of the time element needed workers have been and are being prepared to enter defense industry production.

Physical examinations are required before entrance into all of these programs and the youth are taught health and safety methods throughout the training period. Much stress is placed on physical safety methods and strict observance is required on all work experience projects and in the college shops. Adequate safety devices are provided on all machines which might endanger loss of limbs, sight, or general health.

Individual and project production have enabled youth to become efficient in numerous skills taught under defense programs. Each course taught is directed toward the gaining of skill in handling machine operations and the manipulation of materials and compositions, the purpose of which is the adaption of such skills to private employment.
The large per cent of agency trained youth employed at the end of their training has been shown in statistical data in this study.

Related training given the out-of-school youths in the agency programs has enabled many of them to readjust themselves to fields of work in which they have greater interest and ability. Many youth have become supervisors in the agency programs and in industrial defense plants. If they had not had related training many would be unable to apply the shop technique learned. The methods used by teachers in the agencies stress efficiency on a production basis and not efficiency in individual skills because present day industry is set up on an assembly line production basis. The coordination of related training and training in specific skills results in workers well trained for assembly line production.
CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

With unemployment reaching an enormous figure at the time the N.Y.A. was established, the early aims of this youth education-employment program was to enable youth to be taken from unemployment rolls and bread lines. The N.Y.A. workers were not permitted to work full time in order to accommodate the greatest number of youth and at the same time give each youth enough work experience and salary to aid in family support thereby helping to raise the standard of living among the unemployed.

The possibility of invasion and war seemed imminent so all efforts have been directed toward preparing youth to enter into defense industry by way of the N.Y.A. and the National Defense Training Program. These youth have been able to get full time employment after a short but intensive period of training.

In the light of the data and tables in this study the conclusion is drawn that the N.Y.A., the National Defense Training Program and the Teachers College Industrial Arts departments are effectively preparing youth to find private and defense industry employment.
General health conditions of the boys and girls enrolled in the N.Y.A. and the boys in the National Defense Training schools are greatly improved. Home conditions have benefitted from the related training studies of the youth in N.Y.A. residence centers. Sanitation and nutrition studies included as defense measures enable these youth to better guard against disease and sickness.

The National Defense Training Program in Texas alone has enabled thousands of youths to have industrial training that could not be served by the N.Y.A. or the colleges.

Operating on a 12 months basis during the coming fiscal year, it is believed, the National Defense Training Program will make possible the training of additional thousands of youths for active participation in defense industry preparation and manufacture.

The teachers colleges of Texas have definitely aided the national defense program. The studies offered by the industrial arts departments correlate with the defense training work. The fundamentals of the defense training program for workers includes the subjects: sheetmetal, machine shop, woodworking, and mechanical drawing. The manufacture of airplanes, tanks, guns, ammunition, and shipbuilding are all dependent upon workers having had these fundamental subjects. It is true that many of the skilled and unskilled workers now employed did not have these fundamental subjects; but
the subjects are deemed essential and the training program provides ways and means for getting these subjects in the shortest possible time.

In order to arm our own forces and at the same time supply friendly nations with arms and goods it is imperative that our defense output be greatly accelerated and increased in volume. This means that additional workers for defense industry plants will be needed.

The N.Y.A. and the National Defense Training Program are expanding and they will be able to supply a major part of the needed factory workers within the year beginning September 1941.

It has been estimated by the Office of Production Management that industry will be in full production by July 1, 1942.

Further Study Needed

It is recommended by the writer that further study be made with data compiled and organized in the manner of the Youth Surveys of the American Youth Commission. After this has been done, it will be possible to effectively evaluate and compare the accomplishments of the youth educational agencies. Much information could be obtained by following up the reports on workers as kept by the N.Y.A., the National Defense Training Programs and the Industrial Arts departments of the Teachers Colleges with reports from the factories on these same youths after they have been employed
on a regular job for some time.

Recommendations

The writer also recommends that studies be carried on by the curricula committees of the high schools and colleges of Texas in order to train youth more adequately for industry rather than merely meeting the requirements in order to graduate. The writer finds no fault with subjects now required; but in order to eliminate some of the costly out-of-school programs there should be put into the curriculum practical trades classes that do more than prepare youths for "white collar" jobs.

The writer recommends that the adoption of more courses in the field of industrial arts with the waiving of certain specific requirements will encourage college students majoring in other fields to do more elective work in the field of industrial arts. Studies have shown that the youth trained in this field of practical endeavor are well-balanced and well-rounded individuals. Studies have also shown that many more teachers, supervisors, and administrators are being chosen from this field.
BIBLIOGRAPHY

Books


Articles

Ashley, L. F., "Leaving the Crossroads in Teacher Education," Industrial Arts and Vocational Education, XXVII (September, 1933).


Reports


Pamphlets


Searle, Frederick E., "Preparing High School Graduates and Others for Skilled Work in Industry," An address, Dearborn, Michigan, February, 1940.

Catalogues

North Texas State Teachers College.

East Texas State Teachers College.

West Texas State Teachers College.

Southwest Texas State Teachers College.

Sul Ross Texas State Teachers College.

Sam Houston Texas State Teachers College.

Stephen F. Austin Texas State Teachers College.