A STUDY OF PRODUCTION WORK IN SELECTED CALIFORNIA SENIOR HIGH SCHOOL INDUSTRIAL ARTS WOODWORKING CLASSES

by

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C. M. H.
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MAP OF CALIFORNIA
Showing Location of Schools in the Study

Code - Schools Over 1000 •

- Eureka
- Oroville
- Yuba City - Marysville
- Santa Rosa
- Lodi
- Concord
- Oakland
- Alameda
- Modesto
- San Leandro
- Centerville
- Santa Clara - Merced
- Madera
- Sanger
- Selma
- Hanford
- Coalinga
- Glendale
- Los Angeles
- El Monte
- Norwalk
- Orange
- Colton
- Redlands
- Riverside
- Huntington Beach
- Santa Barbara
- Santa Paula
- Oxnard
- Santa Monica
- Los Angeles
- Los Angeles
- Inglewood
- Lawndale
- Redondo Beach
- Wilmington
- Long Beach
- San Diego
- Grossmont
- ElCentro
- National City
As used in this thesis, production work means the activity involved in making an article, or an article itself, or the work involved in repairing any article. Such an article or the repair thereof is usually made for the school; proposed by someone other than the student; for other than the student's personal use. Examples of such work are school furniture; stage sets; bleachers; floats; physical education equipment, such as hurdles; carnival booths; dance decorations; or the repair or refinishing of school furniture and other articles for the school. It does not include articles made for sale, or sem-finished articles completed in the school shops for some factory or store, although such articles may normally be considered in the same category. They are not included because such articles are associated with the vocational arts shops rather than the industrial arts wood shop.

Although the literature on administrative and teaching problems in industrial arts education was considerable, varied, and often detailed, little could be
found on studies of production work in senior high school industrial arts woodworking classes. Some of the literature that was reviewed presented such confusing or conflicting view-points that a further study of the problem seemed to offer a worth-while opportunity to ascertain what was the present status of such work, and what teachers were thinking and doing about the problem.

Purpose of this Study

It was the purpose of this study: (1) to ascertain how extensive was the problem of production work in selected California senior high schools; (2) to discover what were the teachers' attitudes about some aspects of production work in those high schools; and (3) to find, or develop, means of mitigating any difficulties encountered by those teachers who do production work in industrial arts woodwork classes.

Importance of the Study

In all teaching situations, there may be factors which tend to limit the full attainment of the general objectives which the teacher tries to reach. In the industrial arts subjects, such limiting factors may be in-
adequacies: (1) of physical equipment, space, and student time; (2) of the teacher's preparation; (3) of student grouping, discipline, and interests; and of (4) teacher time for preparation and presentation. Probably no teaching situation in the industrial arts field ever provided complete adequacy in all these general fields, but interviews with many teachers and a considerable amount of reading of the literature in the industrial arts field led to doubt on the part of the writer that production work in industrial arts woodworking classes had been given sufficient consideration as a factor in limiting the attainment of the general objectives in this field.

The present conception of industrial arts education is different from that which was accepted by the manual training teachers of a few years ago. Emphasis previously was placed on manual or hand-work elements in woodworking classes, in contrast to the present broad interpretation of industrial arts education as general education.

With this changing emphasis, changes in methods, materials, and content of the industrial arts courses were necessary if the present objectives of the courses were to be attained. There was much evidence that such changes were not being made, and that production
work, which was initiated in the schools and seemed to grow during the period when manual training courses emphasized manual activity, was being retained to such a degree that the new industrial arts objectives would have difficulty in finding expression or realization.

This study seems to be important, then, because it seeks to discover the extent of production work in selected schools, and to ascertain if teachers believe production work to be beneficial or harmful in the achievement of the present objectives of industrial arts education in the woodworking classes. Such a study of production work should assist in solving the problems which arise from it and provide a basis for suggestions that would limit or control any harmful factors that might be revealed.

Limits of the Study

The schools Selected This study was confined to the schools of California with an enrollment of over 600 students. Schools with a smaller enrollment were not studied because, in general, it was found that such schools had no teacher who taught industrial arts woodwork exclusively, but were required to teach a general shop program, or subjects in other fields. It was also considered more probable that teachers in
the larger systems teaching industrial arts woodwork exclusively, or nearly so, would be more likely to have the educational viewpoint about the function of industrial arts education as they apply to woodworking instruction.

A further limitation of the study was made by excluding a number of the Los Angeles and San Francisco schools, although they fell within the numerical limitations of the study so far as enrollment is concerned. This was done because of the standardized practices common to cities with special supervision.

In Questionnaire Responses The production work problem presents so many facets that complete study of the whole situation was impossible in a study of this nature. The questionnaire was formulated as carefully as possible about three factors: (1) the class organizations and types of work done, (2) the procedures used, (3) and the teacher's opinions on some important phases of the problem.

One hundred questionnaires were sent to those who were classified as woodshop teachers in schools with an enrollment of over 600 students. The names of the teachers were selected from the California School Directory for 1939. This directory listed all
California high school teachers. A letter was sent to the State Department of Education at Sacramento, California, inquiring about a directory of industrial arts teachers, but the State Department replied that no such directory was compiled.

Fifty-six of the questionnaires were returned, but six of them were not usable. One came back unclaimed; one said no production work was done in his shop; one was obviously from a Smith-Hughes vocational woodshop; two came too late to be tabulated; and one said that most of his work was in the metals area. Fifty replies were as acceptable as a basis for the study. Of these, twenty-four were from schools with an enrollment of more than 600 and less than 1,000; twenty-six were from schools with an enrollment of over 1,000. The first group will be referred to in this study as Group I, and the latter group will be referred to as Group II. The average enrollment of Group I was found to be 787, and the average enrollment of Group II was 1762.

To obtain over 100 cases of unit shops it would have been necessary to go out of the state of California, where problems may not be comparable.
Definitions of Terminology

**Industrial Arts** A definition of industrial arts which is adequate for the purposes of this study can best be given by listing the objectives given by one of the authorities in the field of industrial arts education. Several lists could be given, but the one most pertinent to the problem was compiled by Warner as reported by Bonser (4:95). This list is from the 'jury' rankings reported in Warner's study on Policies in Industrial Arts Education. These rankings of the purposes of industrial arts for the senior high school are as follows:

1. **Consumers' knowledge and appreciation of the products of industry.**
2. **Formation of desirable personal and social habits and insights.**
3. **Household mechanics, or development of 'handy-man' abilities about the home.**
4. **Avocational opportunities for the development of hobbies or a sideline interest.**
5. **Development of skill with tools or in processes commensurate with the ability of the pupil and incidental to the completion of a project having educational value.**
6. **Exploratory or finding values relating to discovery or try-out of interests and abilities.**
7. **General guidance, both educational and vocational, gained through study of industrial occupations.**
8. **Integration with other studies and interests both in and out of school.**
9. Vocational preparation for definite industrial occupations for those expecting to enter such vocations on leaving school.

It is important to notice the ninth rank given to "vocational preparation" by the jury.

Struck (10:53), classifying industrial arts projects on the basis of purpose, says such projects are:

---designed primarily to give try-out and exploratory experience; given in order to develop appreciation of tools, materials, processes, design, and of what the world is doing industrially; given from the standpoint of making intelligent consumers.

Production Method, a definition of this method is given by Struck (10:40), who says:

The term 'production method' as applied to shop instruction refers to a method of teaching (as well as to shop organization and management) that seeks to duplicate in the school shop actual working conditions and standards as they exist in the trade or in industry and that involve instruction on production work if not on a commercial product. The term is a rather general one for instruction given in connection with work on a productive basis.

The differentiation between production work and production method may be further clarified by noting that production work may or may not be done by the production method. The production method is often referred to as the factory or line production techni-
Suppose a class were asked to make several hundred cribbage boards for a local hospital. Simultaneously one boy cuts out the stock for all the boards; another rounds all the corners; another sands the surfaces; still another marks out the position of the holes, and so forth. Usually when a great many identical units are to be made the production method may be used, but when a single product or only a few are to be made, the method is not applicable. The product is then "custom built"; that is, one completely finished before another is started, or one boy makes several at one time.

Senior High School. In the selection of schools for this study, those schools organized on the four-year plan or those with the tenth, eleventh, and twelfth grades were chosen. In a few instances, junior-senior high schools were used, but only when the woodshop instructor taught woodwork in the senior high school groups insofar as could be ascertained from the California School Directory.

Method and Device Used in the Study

The survey method was the only one practicable to secure the information needed. The literature con-
cerning production in the school shops was found to be very limited and often the opinions of writers were conflicting. Since the schools to be studied were widely scattered personal interviews were prohibitive because of the expense required; consequently the questionnaire was used as a device to secure the data needed for the study. The questionnaire was formulated to determine: (1) the extent of teacher and pupil time devoted to production work in the selected schools; (2) the opinions of the teachers about important phases of the problem; and (3) the attempts being made to organize production work in the schools.
CHAPTER II

REVIEW OF RELATED STUDIES AND LITERATURE

Production work has been a real problem for woodshop teachers for many years, but no recent studies of importance could be found. In a survey of the cities of Illinois, Ashley (1:1) found conditions which he considered most unfortunate in the manual training shops of that state. He said:

Of the cities of Illinois, sixty-nine per cent say that the course in manual training includes the making or repair-ing of school equipment. Thirty-four per cent report that they do this work at stated periods, but fifty-five per-cent of the superintendents of the state report that the manual training class must make or repair school equipment at any time such repair of equipment is needed.

The dominance of the superintendents in determin-ing the amount, the kind, and the time when production work was to be done was considered most inadvisable by Ashley. Some of the reasons why school boards and super-intendents demand that their manual training shops do production work, and why the shop teacher is powerless to refuse eventhough he considers such work disadvanta-geous, are given by Ashley (1:1):

Manual training when introduced in some schools is immediately looked upon by the superintendent or the school board as the logical means of securing repairs or ad-ditions to school apparatus. Through
such reasoning these things can be had with a minimum of red tape and expenditure of money, and at times when apparatus could not otherwise be secured. It does not matter, as a rule, what work is being carried on in the manual arts department, when the need for repair or added equipment comes, the superintendent requests that other work stop until this repair work or the equipment is made.

Further evidence that production work may have a disturbing influence in the industrial arts shops is given by Struck (10:41-42), writing on production work in the vocational shop:

....the greatest difficulty arises from the fact that instructors are frequently asked to route through their shops jobs that contain no new teaching content, and that cannot be justified on the basis of educational requirements of the students and that ought not, in fairness to the students be undertaken as an educational enterprise at that time and place.

From that statement it appears that the teacher has no control of the kind of jobs that come to his shop, or of when they come. The assumption may be made that if the right kind of jobs came to the shop at appropriate times, and in the right amount, production work might have some merit. Friese, as reported by Bawden (3:153) stated that certain methods of doing work which are commonly associated with production work
might be beneficial to industrial arts woodworking classes:

Because industrial arts does represent trades and industries, it is very important in dominately exploratory courses that students have try-outs that approach reality. This means that there should be experiences in quantity-production procedures. If this is omitted, the student is left without a real concept of the nature of repetitive labor.

Not all teachers are opposed to production work. In writing about production in the print shop, Buboltz (5:216) said:

The ideal condition is not a shop that does no practical work, but one which can control its production work in such a way that the right kind of work comes into the course at the proper time.

Donson (6:62) reported on some of the statements for and against production work as follows:

It upsets the shop program and disrupts the course outline. It usurps the time of the teacher who must make jigs and perform skilled operations too difficult for his students. This requires so much of his energy that little or no time is left for teaching.

All the teacher gets out of production 'is just a lot of grief.'

Many industrial arts teachers are heartily in favor of production work.

Most of these agree that the work
should be for the school, that it should be done during the regular shop period, and that it should not be too much of a hurry-up job.

The production work created great interest among the boys, gave them some knowledge of actual production methods and was the means of giving them some vocational guidance information.

Donson did not indicate his source of authority for these various opinions but the statements he makes serve to show that the literature and the opinions about production work are quite conflicting.

Buboltz, who was previously quoted, suggests some definite procedures that may serve to alleviate the difficulties associated with production work in the print shop. Since the problems common to print shops are also common to woodwork shops, his suggestions may offer a solution for some of the problems in the woodshop:

It is impossible to continue production work if everyone in the school building is permitted to come directly to the printshop and order any printing they desire. In schools where the teaching time of the instructor takes up the entire day, it is impossible for him to make explanations to all who come in to enter orders. For this reason it is necessary to insist that orders be entered in the school office.

A small pamphlet was prepared that explained the manner in which copy should
be prepared, the rules governing the use of the shop, and the manner in which orders should be entered.

A suggestion that production work may not be inherently bad, but may have some values if it is properly organized and administrated, is made by Erickson, (7:224) who writes:

Quantity production in the school shop possesses outstanding educational values when properly conducted, but when demands for production ignore the interest or abilities of the students, then the project is not educational and violates every principle of reasonable procedure.

Apparently contradictory to the opinion just expressed by Erickson is that of Friese as reported by Bawden (3:156) who writes on the necessity for a different procedure in industrial arts education than in vocational arts:

Following the concept of individualized instruction and somewhat variable standards of achievement, it is natural that the craftsman method of production, rather than the quantity-production, should be the basic procedure in industrial arts. Moreover, the adolescent boy usually wishes to do all of a job and have the result all his own.

Though other writers in the field of industrial arts education may feel that there is a place for production work in the woodworking shops, Ashley
(2:225) obviously was much opposed to production work in the shop. In 1938 he wrote on the subject "Who shall teach in the General Shop":

He must be an organizer and at the same time a walking fund of knowledge. His position must be understood by the head school officer so that he will be given time without infringement upon it, to develop and carry out a successful program. It is hard to believe in this connection that as late as 1921, 62 per cent of the superintendents in Illinois deliberately exploited their pupils by requiring that the 'manual training teacher' and his students make and repair school equipment any time such was wanted. If these superintendents live today, they need to get down on their knees and pray for forgiveness of the now grown men whose time they wasted. May the time speed forward to the day when the future director of laboratory work is permitted to have no more hours of classwork than is the academic teacher in the better schools now, in order that pupils will be able to reap the full possibilities that careful preparation and constant attention of the teacher can make possible.

Since the woodshop teachers are in the best position to know whether they are able to carry out their industrial arts objectives, it would seem that they would not permit factors that were disruptive to those objectives to persist in their shops for long. Ashley (1:1) explains why he thinks the shop teachers have
been unable to improve the situation greatly when he says:

If the opinion of the manual training teacher is asked about the advisability of doing the work, at the time it is wanted done, he, knowing that his position depends upon his willingness to co-operate, at once assures the superintendent or the board that it is the proper thing to do. The manual training shop is thus made the dumping ground for all odds and ends of work that need to be done about the school premises.

In the same article, Ashley further expresses his opposition to production work, especially that which the teacher must do:

The doing of such work may require the effort of a layman. Where this is true, in order that the work be properly done, the teacher must do it, and thus cheat the pupils of his time for instruction as well as the layman of his rightful employment. In this way he forces antagonism between the school and the labor union. Are such methods correct from the standpoint of pedagogy?

Later in the same article, he states that production work often prohibits orderly teaching procedures and makes the course of study quite useless:

All teachers will agree that a pupil makes progress only in that system which is rational -- that system which is carefully worked out and which has a logical beginning and a worth-while end in view. Consequently, all school work must be carefully planned and so
organized that there will be no breaks in the line of advancement for the pupil. This is true of all subjects for all classes of schools. This careful order of procedure must not be broken or altered if the desired results are to be accomplished. Some head school officers do not have the proper regard for this law. Others seem to be ignorant of it. To illustrate, the superintendent desires certain information from each parent in the city and this will necessitate the writing of a great many similar letters. Finding his stenographer already loaded with work, and knowing that letter writing is a branch of English work in school, he goes to the English teacher, who is working on Tennyson's poems at the time, and requests that the class stop their work for the present and write the letters for him. After a pupil writes one, very little that is of instructional value remains in writing more. Further, what is the result with regard to the study of Tennyson?

Ashley's article continues and presents a similar analogy with respect to the effect on a mathematics class. He concludes his article with statements that show why manual training classes do not accomplish what they should:

It is a very common thing for the head school officer to request that the class in manual training repair this or make that regardless of the plans of the teacher. As a consequence, the amount of good that comes from manual training falls far short of what can be accomplished under proper methods and supervision.

Since the quotations from Ashley's article are
twenty years old, it might seem doubtful that similar conditions would continue; but Smith, as reported by Bawden (3:73) in 1934, said:

All schools are tending more and more to meet the special needs of their student bodies and localities, so that the equipments and practices vary for different school units in the same system. The demands for personal attention on the part of the officials in charge of this work extend to practically every building in a city and call for working relationships with all principals and all other directors and supervisors. Many superintendents and boards look upon the industrial department as one of service to the entire system, as one actually to provide additional revenue. The production plan, which must support this policy, while a method of considerable importance in trade education, has been used beyond reason in industrial-arts situations.

If production work can be organized to fit the educational function that projects are supposed to fit in the woodworking classes, several authorities believe that it may be used. In 1936, Struck (9:2) said:

Home and community projects are welcomed provided that they can be made to fit into the work at hand and are such that they can be justified educationally.

Writing about production work in the vocational arts classes Struck (10:43) said:

Some of the disadvantages may be: (1) Insufficient all-around knowledge and skill; (2) occasional exploitation of pupils. It will be seen that these disadvantages are not necessarily fea-
tures of the method but are possible developments that may be avoided through proper foresight.

The qualifying statement that Struck makes in the above quotation loses some of its force when the difference between the objectives of industrial arts and vocational arts is considered.

The attitude of the students toward production work necessarily affects the value of the industrial arts for the students, and on this matter Struck (10:75) says, in part:

Naturally the boys are often reluctant to side-track their partially completed personal projects in order to glaze a window, refinish a table, or make a magazine rack for the school district.

On this matter of student interest, Struck (10:74) writes about the effect that motivation might have:

Other things being equal boys are much interested in personal projects—that is, in projects that they elect to undertake for themselves or for relatives or friends as distinguished from projects made for the school. There is, however another factor that is of major importance in determining the maintenance of interest; it is, whether or not the instruction is, in the opinion of the pupils, worthwhile in terms of preparing for the immediate and even for the more remote future. Pupils who have always worked on personal projects and then have been put
on a production project like building a set of shop benches for the school district have shown just as much interest in the group projects as in personal ones...Pupils are willing to forsake the immediate reward of a product for their personal use in favor of group or school projects in order to get better training or instruction on new types of jobs and projects.

In the above statements Struck is writing chiefly about the shops teaching skilled trades.

Some teachers have found satisfactory elements in production work and have carried on a large part of their instruction through such work. This situation was discussed by Wood (12:246-247) as it existed in his own shop.

Whenever a body of wood-shop teachers get together the discussion is almost sure to turn, sooner or later to the question of using part or all of the boys' shop time in the production of school furniture. Many arguments are advanced for and against the question but the present trend seems to be toward such work for at least part of each year rather than simply allowing the boy to spend his entire time in making something for his home....Very few of the boys are not interested in making something for the school, especially if they know where it is to be used....However, the school work must not be continued too long....We have tried giving one whole semester to school work and the next to the individual. This, for us, was
too long a period...finally have
cut it to somewhere between one-
third and one-half of each semes-
ter.....As for disadvantages we
have not found any.

Wood (12:246-247) says that the students come
to his senior high school after they have had a year
of work on hand tools in the junior high school.
They came with ideas for such a wide variety of pro-
jects that many machines were needed at once, there-
fore he put them into gangs and had them do produc-
tion method work on school furniture first. Thus he
was able to give them group instruction on the ma-
chines in a more orderly way. By doing this before
they started on their own projects, they learned
orderly procedures and did not have to run to the
teacher for instruction at odd times; consequently
a factory-like spirit of efficiency and speed was in-
culcated that was beneficial to them when they began
their own projects.
CHAPTER III

STUDY OF THE DATA

Information received from the survey was studied in five main sections:

A Organization for Production Work
   Numbered parts of questionnaire 1, 2, 3, and 4

B Management of Production Work
   Questions 5, 7, 8, 9, 11, 12, 14, 16, and 17

C Nature of Production Work
   Question 10

D Production Work and Industrial Arts
   Questions 6, 13, 15, and 18

E Values of Production Work
   Question 19

The data for each section of the study were placed in an Appendix correspondingly lettered. That is, data for section A above, were placed in Appendix A.

Organization for Production Work

Analysis of the first three divisions of the questionnaire can best be presented in tabular form as shown in Table I.
Table I

Class Organization for Woodworking

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<th>Group I</th>
<th>Group II</th>
<th>For Both Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment 600-1,000</td>
<td>23.25</td>
<td>25.47</td>
<td>24.38</td>
</tr>
<tr>
<td>Enrollment Over 1,000</td>
<td>23.25</td>
<td>25.47</td>
<td>24.38</td>
</tr>
<tr>
<td>Enrollment Both</td>
<td>23.25</td>
<td>25.47</td>
<td>24.38</td>
</tr>
</tbody>
</table>

Average size of class

Average number of classes per day

Average number of minutes per class per day

Data for this table is taken from Appendix A

In studying the 245 industrial arts woodworking classes, no significant differences appear in the size of the average class, the number of classes per day, or the length of period for the groups of schools. All groups approximate the hour-period, with five class periods per day.

An approximation of the total number of students in woodworking classes in the schools studied was made by taking the product of the average number of classes per day, the average size of the classes, and the number of schools in the study. This product is 5,973, which represents the approximate number of students.
enrolled each day in all the classes of all the teachers in this study.

**Distribution of Production Work** Under this topic, a study is made of the frequency with which the classes in the several woodworking courses did production work. Study of the data in Table II, from Appendix A, indicated no significant difference between schools in Group I and Group II in general distribution of the production work done; but it did reveal that fifteen of the classes did all of the production work in their respective schools. In no instance did the teacher unaided by pupils do all of the production work for the school. The study further revealed that some production work was done in every one of the woodworking courses listed. This wide distribution of the work indicated that in a significant number of cases (ten to forty-two) production work affected every organized woodworking course in the schools. The classes that were most frequently required to do some or all of the production work were found to be the advanced classes, Woodwork II and Woodwork III.
Table II
Woodworking Classes and Production Work in All Schools
(Condensed from Appendix A)

<table>
<thead>
<tr>
<th>Totals for Class Distribution of Production Work</th>
<th>Do no Work</th>
<th>Do Some Work</th>
<th>Do All The Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Shop I*</td>
<td>4</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Woodwork I</td>
<td>9</td>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>Woodwork II</td>
<td>2</td>
<td>41</td>
<td>1</td>
</tr>
<tr>
<td>Woodwork III</td>
<td>1</td>
<td>38</td>
<td>3</td>
</tr>
<tr>
<td>Woodwork IV</td>
<td>2</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>Special classes for Production Work</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

*Read: 4 of the general shop classes do no production work, 12 do some, and none do all production work

Table II also shows that in only ten instances, or 6.7 per cent of all the classes, were there specifically organized classes to do some or all of the production work.

A tabular summation of the data in Table II is given in Table III:

Table III
Distribution of Work for All Classes

<table>
<thead>
<tr>
<th>Do None</th>
<th>Do Some</th>
<th>Do All</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of classes</td>
<td>22</td>
<td>149</td>
<td>15</td>
</tr>
<tr>
<td>Per Cent of classes</td>
<td>11.8</td>
<td>80.1</td>
<td>8.1</td>
</tr>
</tbody>
</table>
From Table III, it may be seen that 88.2 per cent of the classes for which data were given took part in doing the production work required by the schools, and only 11.8 per cent of the classes did no production work.

Management of Production Work

The data concerned with management of production work are taken from nine sections of the questionnaire. The three main divisions under which the data are presented are: (1) what steps are preliminary to starting production work in the shop; (2) when production work is done, and (3) what students do the production work.

Preliminary Steps  Questions number fourteen and fifteen in the questionnaire were asked to discover who was permitted to go directly to the shop to place an order, or whether administrative procedures had been established to route orders through the principal's office for receiving an initial approval. Table IV from data in Appendix B, shows that fewer than half (46.9%) of the schools were prohibiting orders to be placed directly with the shop instructor.
Table IV

Schools Permitting Anyone in School to Order Production Work Directly from Shop Teacher

<table>
<thead>
<tr>
<th></th>
<th>Permitted</th>
<th>Not Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Group I</td>
<td>15</td>
<td>62.5</td>
</tr>
<tr>
<td>Group II</td>
<td>11</td>
<td>44.0</td>
</tr>
<tr>
<td>All</td>
<td>26</td>
<td>53.1</td>
</tr>
</tbody>
</table>

Table IV also shows that the shops in Group II were less frequently affected by visits from anyone in the school than were those shops in Group I.

Table V

Schools Requiring Administrative Approval of Production Work

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Group I</td>
<td>9</td>
<td>37.5</td>
</tr>
<tr>
<td>Group II</td>
<td>14</td>
<td>56.0</td>
</tr>
<tr>
<td>All</td>
<td>23</td>
<td>46.9</td>
</tr>
</tbody>
</table>

The data in Table V, from Appendix B, shows that 56 per cent of the larger schools (Group II) required
approval of the principal for production orders, as did 37.5 per cent of the smaller schools (Group I). Several teachers said that production orders passed through the office of the department head; and where such was the case, those answers were included in the "yes" data. This was done because the responsibility of the department head was considered administrative in function and thus equivalent to having the orders passed through the principal's office.

Premininary to accepting production work, some individual must decide the quantity advisable or feasible for student production as well as those for whom production work may be done.
From Figure 1 (Data from Appendix B), it appears that the teacher determines the amount of production work to be done in 64.6 per cent of the cases, and jointly decides with the principal in 16.6 per cent of the cases. This means that the teacher in 81.2 per cent of the cases has a part in determining how much production work is to be done in his shop.

In some communities, production work in schools is apparently in direct competition with local labor;
therefore it is sometimes considered unethical for a public institution to do such work. The teachers surveyed responded to a question concerning the established policies relating to the limitations placed on agencies for whom production work was accepted. Question eleven was asked to determine whether the teachers thought production work should be accepted for the school only.

Table VI

Responses of Teachers as to Whether Production Work should be done Only for the School

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th></th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per Cent</td>
<td>Number</td>
</tr>
<tr>
<td>Group I</td>
<td>12</td>
<td>52.6</td>
<td>11</td>
</tr>
<tr>
<td>Group II</td>
<td>17</td>
<td>70.8</td>
<td>7</td>
</tr>
<tr>
<td>All</td>
<td>29</td>
<td>61.7</td>
<td>18</td>
</tr>
</tbody>
</table>

Table VI, compiled from the data in Appendix B, shows that 61.7 per cent of the teachers favored production for the school only. The others favored a policy of also considering all other orders. Two replies, which are included in the "no" totals above, said that in their opinion, production work could
also be done for community welfare and charitable organizations. The data revealed a significant difference between the schools in Group I and in Group II, in that the teachers in Group II are quite evidently more opposed to production work for agencies outside the school than are those in Group I.

When Production Work is Done Time for production work is often included in the regular courses as part of the instructional content of woodworking. The teachers were asked to state whether such time was provided in their regular courses.

Table VII

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Group II</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>All</td>
<td>26</td>
<td>24</td>
</tr>
</tbody>
</table>
From table VII, based on data in Appendix B, it is shown that 52 per cent of the teachers were making provision for including production work instruction in organized courses. Since all the schools in the study did production work, obviously nearly half of them had no organized classes for this work. More of the smaller schools provided such class time as part of the teacher's load than did the larger ones.

It is generally agreed that production work cannot be carried on in the woodworking classes with the teachers devoting no time for planning and supervision. The following Table No. VIII, based on data in Appendix B, shows that the average amount of time spent by each teacher on all types of production work amounted to 7.91 hours per week.

Table VIII

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>7.19</td>
</tr>
<tr>
<td>Group II</td>
<td>8.64</td>
</tr>
<tr>
<td>All</td>
<td>7.91</td>
</tr>
</tbody>
</table>

If we consider a teacher's week to consist of forty hours, then this amount of time shows that nearly 20
per cent of the teacher's total time is devoted to production work; and it must be remembered that nearly half the teachers were required to spend time other than class hours. The teachers in Group I averaged 7.19 hours per week for this work and those in Group II averaged 8.64 hours per week.

One of the customary requirements of production work is that the work be completed within a short space of time. In fact it is not unusual to find that the five days in the school week do not provide sufficient time to accomplish all that is required. To discover how many teachers found it necessary (alone or with a selected group) to do production work on Saturdays and holidays in the shops, data on the subject was requested.

Table IX
Teachers Required to Do Production Work on Holidays and Saturdays

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Group I</td>
<td>12</td>
<td>52.1</td>
</tr>
<tr>
<td>Group II</td>
<td>4</td>
<td>16.0</td>
</tr>
<tr>
<td>All</td>
<td>16</td>
<td>33.3</td>
</tr>
</tbody>
</table>
Table IX, based on data in Appendix B, shows that one third of all the teachers found it necessary to do production work on other than regular school days. Over half of the teachers in the smaller schools and one fifth of those in the larger institutions found it necessary to do production work on Saturdays and holidays. Undoubtedly the procedure of organizing regular scheduled classes for production held during the regular school days made it unnecessary for the teachers in the larger schools to do production work on Saturdays and holidays.

**Students Selected for Production Work**  It has been shown by the data in Table III that 80 per cent of the schools reported doing a varied amount of production work. Inquiry was also made to ascertain which students within the classes worked on production. Data on one aspect of this question is taken from Appendix B and is condensed in Table X to show that 60 per cent of the schools reported using indigent students to do most of the production work. It is the established practice in nearly all schools that students be required to pay for materials used in the construction of projects which become the property of the students.
Table X

Indigent Students Reported as Doing More Production Work than Others

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th></th>
<th>No</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per cent</td>
<td>Number</td>
<td>Per cent</td>
</tr>
<tr>
<td>Group I</td>
<td>13</td>
<td>52.0</td>
<td>12</td>
<td>48.0</td>
</tr>
<tr>
<td>Group II</td>
<td>17</td>
<td>65.4</td>
<td>9</td>
<td>34.6</td>
</tr>
<tr>
<td>All</td>
<td>30</td>
<td>60.0</td>
<td>20</td>
<td>40.0</td>
</tr>
</tbody>
</table>

Production work, then, does provide the indigent pupils with materials necessary for instruction. It must be admitted, however, that the instruction given on production work may not parallel that which is included in the making of pupil-selected projects. The limitations of this study prevented inquiry into the possibility of a resultant weakness in teaching methods.

A method of assigning production work to pupils, other than that of selecting only indigent students, is to divide the class into smaller groups and to assign only a portion of the semester's production work to each of these smaller groups. Thus each boy shares in the production experience but devotes only a fraction of his time to it.
Where production work proves educational, all should share in its benefits; and where it is harmful, a wise apportionment of the work should result in a minimum of harm. Table XI, summarizing the data on Question 16 in Appendix B, shows the present practices.

Table XI
Production Work Rotated between Groups

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Group I</td>
<td>10</td>
<td>41.7</td>
</tr>
<tr>
<td>Group II</td>
<td>9</td>
<td>36.0</td>
</tr>
<tr>
<td>All</td>
<td>19</td>
<td>38.9</td>
</tr>
</tbody>
</table>

There was no great difference between the schools in Group I and Group II in the use of this method of distributing the work to all the students, but 38.9 per cent of the schools reporting do rotate their class groups on production work.

Nature of Production Work

The nature of the products that resulted from production work seemed to merit study. The approximate
number of pupil-hours employed on the various divisions of production work was requested in Question ten, (Appendix C).

Figure 2

Type of Construction and Average Time Consumed per School
(From data in Appendix C)

<table>
<thead>
<tr>
<th>Type of Production</th>
<th>0</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furniture</td>
<td>845</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>613</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenery</td>
<td>397</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parade Floats</td>
<td>297</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.E. Equipment</td>
<td>290</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructional</td>
<td>283</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>202</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average Number of Hours per School

*Read: The average school consumed 845 pupil-hours in construction of furniture.

The data from schools responding to Question ten, showing types of work done, is illustrated in Figure 2. Furniture construction required the greatest amount of production time, while parade floats required the least. It was not surprising that furniture construction should have consumed more time than any other type of produc-
tion work in the woodworking classes, because that type of work has been done by industrial arts woodworking classes for many years.

In answering Question ten, several schools indicated no specific number of hours, but merely checked the question to show that they did work in some of those divisions. Since the total number of schools doing the various kinds of production work seemed sufficiently important to report, a special table was prepared for them. Data in Table XII gives the number of schools that failed to give any approximate numerical hours for their work.

Table XII

<table>
<thead>
<tr>
<th>Types of Production Work</th>
<th>Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furniture Making</td>
<td>6</td>
</tr>
<tr>
<td>Scenery for Dramatics</td>
<td>4</td>
</tr>
<tr>
<td>P.E. Equipment</td>
<td>5</td>
</tr>
<tr>
<td>Instructional Materials</td>
<td>5</td>
</tr>
<tr>
<td>Shop Equipment</td>
<td>5</td>
</tr>
<tr>
<td>Parade Floats</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
</tr>
</tbody>
</table>

It was considered important to ascertain the number of schools that did each of the several listed types of construction. Data received on Question ten gave that information and are illustrated in Figure 3.
Figure 3

Number of Schools and Types of Construction
(Data from Appendix C)

<table>
<thead>
<tr>
<th>Type of Construction</th>
<th>Number of Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.E. Equipment</td>
<td>45</td>
</tr>
<tr>
<td>Shop Equipment</td>
<td>43</td>
</tr>
<tr>
<td>Furniture Cont'd.</td>
<td>42</td>
</tr>
<tr>
<td>Instructional Materials</td>
<td>38</td>
</tr>
<tr>
<td>Scenery</td>
<td>31</td>
</tr>
<tr>
<td>Others</td>
<td>31</td>
</tr>
<tr>
<td>Floats</td>
<td>6</td>
</tr>
</tbody>
</table>

Figure 3 shows that forty-five schools indicated that they made equipment for the physical education department, and that only six reported making parade floats. It is interesting to note that while 42 schools reported making furniture, 45 schools reported making physical education equipment.

The total estimated hours devoted to production work by both large and small school groups was 111, 606 pupil hours. (Data taken from Appendix C). From the data given by each school, the total number of pupil-
hours consumed during the entire year for all woodworking classes in the fifty schools was estimated to be 874,416.

The total available time that was devoted to production work would perhaps be more meaningful. To make this estimate, the number of effective full time school days must first be assumed. Although the schools of California are required to have instruction for 172 days, activities, assemblies, absences, and other limiting factors may be assumed to reduce this to no more than 160 effective full-time school days. The number of days per year that the average advanced woodworking student devotes to production work would then be the percentage of each pupil's time given to production work multiplied by the full-time school days, or: 0.1299 x 160, or 20.78 days. The average advanced woodworking student, then, spends nearly 21 days of the school year on production work.
Production Work and Industrial Arts

This section is devoted to (1) the effect of production work upon the pupil interest; and (2) the interruptions of teaching procedures caused by the teacher's either leaving the regular class to supervise production work, taking orders, ordering and receiving supplies, giving direction to atypical students and so forth; actually doing work too difficult for pupils; or filling a rush order. Table XIII, taken from data in Appendix D, indicates the interest of pupils in production work, as judged by their teachers. Nearly nine out of ten teachers (89.4%) stated that their pupils disliked production work.

Table XIII
Student Preference for Production Work Projects

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>Group II</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>All</td>
<td>5</td>
<td>42</td>
</tr>
</tbody>
</table>

It is recognized by all authorities that one of the factors essential to learning is interest. To se-
cure this interest, various teaching procedures are established, and frequently different materials are introduced so that interest is maintained or increased. In the industrial arts courses, it is recognized that little motivation is usually necessary to secure interest, but the data in Table XIII indicates that where production work is undertaken in industrial arts woodworking courses, 89.4 per cent of the students prefer working on projects of their own. This preponderance of opinion against production work on the part of the students shows that whatever motivation may have been used in an attempt to interest students in work of the production nature, it was not effective. Therefore it would seem that student interest, which is essential in attaining all the values of the industrial arts woodworking courses, was impaired by the requirement of production work.

If the teaching time of a teacher is diminished by interruptions, it is improbable that he will be able to attain the objectives which he has planned for his courses. To ascertain whether production work was a source of interruption to the woodworking teachers, data on one of the possible causes of interruption was obtained. The data, from Appendix D, Question thirteen,
are shown in Table XIV.

Table XIV

Teaching Time Consumed in the Supervision of Production Work

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th></th>
<th>No</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per cent</td>
<td>Number</td>
<td>Per cent</td>
</tr>
<tr>
<td>Group I</td>
<td>20</td>
<td>83.3</td>
<td>4</td>
<td>16.7</td>
</tr>
<tr>
<td>Group II</td>
<td>18</td>
<td>75.0</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td>All*</td>
<td>38</td>
<td>79.2</td>
<td>10</td>
<td>20.8</td>
</tr>
</tbody>
</table>

*Read: 38 teachers said their teaching time was reduced by the need of supervising production work; 10 said it was not.

Apparently 79.2 per cent of the teachers had found no method that would prevent interruptions of their teaching time.

Production work may by its nature or amount disrupt the teaching procedures planned by the instructor. To discover whether such disruption occurred in the schools studied seemed pertinent, as one of the problems arising from production work in the industrial arts shops. It would seem that if teachers anticipated the amount of production work which they might be required to do, their teaching procedures would be
planned so that the least possible disruption would occur. It is acknowledged that, although a teacher may plan his teaching procedures in such a manner that production work may be anticipated, it may still be impossible to prevent disruption of teach procedures unless administrative co-operation is received. To learn whether production work did disrupt regular teaching procedures, data were requested in Question fifteen, Appendix D. Table XV is compiled from this data and shows that 75.5 per cent of those who supplied the data had been unable to prevent production work from disrupting their regular teaching procedures.

Table XV

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per cent</td>
</tr>
<tr>
<td>Group I</td>
<td>19</td>
<td>78.2</td>
</tr>
<tr>
<td>Group II</td>
<td>18</td>
<td>72.0</td>
</tr>
<tr>
<td>All</td>
<td>37</td>
<td>75.5</td>
</tr>
</tbody>
</table>

Table XV also shows that there was little difference between schools in Group I and Group II in the amount.
of disruption caused by production work.

Where production work is well organized, it should have some values in the industrial arts program. Data were requested to ascertain whether the teachers in the study thought that a change in the amount of production work they were doing would enable them to carry out the industrial arts program better. The data on Question Eighteen, Appendix D, are presented in Table XVI.

Table XVI
Change in Amount of Production Work to Be Beneficial to Industrial Arts Program

<table>
<thead>
<tr>
<th></th>
<th>Less Work</th>
<th>More Work</th>
<th>No Work</th>
<th>No change*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>14</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Group II</td>
<td>5</td>
<td>0</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>All</td>
<td>19</td>
<td>2</td>
<td>12</td>
<td>9</td>
</tr>
</tbody>
</table>

*written-in answers

From Table XVI, it appears that the industrial arts program could better be carried out by thirty-one teachers if production work were eliminated or reduced. Nine teachers (21.4%) commented that they could best carry out their industrial arts program if the present amount of production work were left unchanged.
Two teachers said that they could better carry out the industrial arts program if the amount of production work in their shops were increased.

Values of Production Work

Where the school woodworking shops are used for production work, whether the objects of that production are made for the school or sold as commercial products, the statement is frequently made that using school children to produce such work is "child exploitation". Data on the teachers' opinions on this issue were obtained and are shown in Table XVII.

Table XVII

Elements of "Child Exploitation" in Production Work

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per cent</td>
</tr>
<tr>
<td>Group I</td>
<td>9</td>
<td>37.5</td>
</tr>
<tr>
<td>Group II</td>
<td>9</td>
<td>36.0</td>
</tr>
<tr>
<td>All</td>
<td>18</td>
<td>36.7</td>
</tr>
</tbody>
</table>

There is little difference of opinion between the schools in Group I and those in Group II, however,
the fact that the opinions of 36.7 per cent of the teachers that the educational value of production work is so limited that employment of children on production work projects is actually "child exploitation" is a serious charge against production work.
CHAPTER IV

SUMMARY AND RECOMMENDATIONS

This study was undertaken for the purpose of ascertaining the status of production work in selected California senior high schools. To accomplish the purposes of the study, it was necessary to gather the desired information from the teachers in the schools selected. A questionnaire was formulated to obtain information pertinent to the study.

The literature of the field was searched for information relating to the problems which the study presented. It was also considered necessary to have a variety of opinions of leaders in the field of industrial arts education about the many facets of the problem.

SUMMARY

The data and opinions obtained show that production work in the senior high school industrial arts woodworking classes in the selected California schools presents a serious problem to many of the instructors.

There were problems involving: (1) teacher and pupil time, (2) teacher and pupil attitudes, (3) administrator and teacher co-operation, (4) course of study
outline, (5) and organization techniques for orderly procedures. The following is a general summary of the findings of the study:

1. The average woodworking class size was about 24 pupils, the typical teacher taught approximately five periods per day; and each period was approximately one hour in length.

2. The advanced woodworking classes did most of the production work.

3. Ten special classes were found to be organized for the purpose of doing all the production work.

4. Eighty-eight and two tenths per cent of all classes were reported as doing production work.

5. Slightly more than half of the schools permitted any person to order production work directly from the teacher, and the same number of schools did not require administrative approval of production work.

6. In nearly two thirds of the schools, the teacher alone decided how much production work should be done; but in about one seventh of the schools, the principal alone determined the quantity.

7. Sixty-one and seven tenths per cent of the teachers believed that production work should be done for the schools only.

8. Only 52 per cent of all teachers reporting made provision for production work in their courses of study.

9. The average time that each teacher spent on all aspects of production work was nearly eight hours.
10. One third of all teachers reported that they occasionally had to do production work on Saturdays and holidays.

11. Sixty per cent of the teachers said that the indigent pupil did most of the production work.

12. Over 60 per cent of the teachers made no attempt to distribute production work to all students by the procedure of alternating groups of students from production work to other types of class work.

13. About an equal number of shops made physical education equipment, shop equipment and furniture.

14. Nearly 13 per cent of the total class time for advanced woodworking was devoted to production work which amounts to approximately twenty-and three fourths days per school year per pupil.

15. Nearly 80 per cent of the teachers reported that their teaching time was interrupted by production work; and about three fourths of them reported that production work interrupted their teaching procedures.

16. Nearly 90 per cent of the teachers reported that their students disliked production work, and preferred working on projects of their own selection.

17. Forty-five per cent of the teachers thought that a reduction in the amount of production work would be beneficial to their industrial arts program; 28 per cent thought that they could better carry out the industrial arts program if there were no production work; and 21 per cent were satisfied with their present program.
18. Over one third of the teachers considered production work "child exploitation".

Conclusions

Production work is most frequently done in the advanced classes of woodworking.

Production work is done in nearly all classes and in all of the schools.

Half of the school administrators permitted orders for production work to go directly to the teacher.

Two thirds of the teachers were given directions to accept or reject orders for production work.

Half of the teachers accepted production work as appropriate material for woodworking instruction.

Production work required an average of 8 hours time per week for the average teacher in addition to regular assignments of his duty.

Almost 90 per cent of the pupils are not interested in doing production work.

Recommendations

The following recommendations are suggested to assist the teacher in the management of production work:

That production work be done in special classes where it is possible to organize them
That production work orders be approved by the department head, principal, or superintendent.

That teachers have final authority in deciding what orders should be accepted and how many.

That production work if properly managed by the teacher be continued as a service to the community and considered worthwhile for instructional material.

That if special classes cannot be organized, production work be rotated among classes or groups, to furnish pupils with a variety of experience, and to promote the social objective of contributing to the social welfare of the community.

That teachers make increased effort to develop and maintain the interest of pupils in production work.

That teachers, if possible, refuse work that seems to exploit pupils.

Since production work in the woodworking classes of California is a well established practice in most high schools and therefore will undoubtedly remain one of the responsibilities of every woodworking teacher, the following suggestions for the management and control of production work are recommended. The material is based upon the findings of this thesis study; the experience of the author; and the recommendations of teachers recognized for their knowledge of the production work phase of woodworking instruction.
Suggestions for the Management of School Production Work

The methods, technique, and devices to facilitate production work in the industrial arts woodworking classes in the upper secondary schools are first outlined and then described as follows:

I The control of quantity
   A Using publicity to interpret industrial arts to the community and school personnel
   B Limiting the number of people placing work orders
   C Restricting the time for placing work orders
   D Requiring the approval of a superior for all production

II The organization of the work through administrative co-operation
   A Using printed forms to explain production work orders
   B Keeping accurate records of all production work
   C Requiring work orders to be placed to give adequate time for the work
   D Giving the teacher authority to reject unreasonable requests for production work

III The considerations of class and student
   A Using special classes
   B Distributing the production work within the classes
      1 To use only part of each student's class time
      2 To restrict production work to a portion of the school year
   C Motivating the production work
      1 To show values in work whenever possible
      2 To give recognition for meritorious work
The Control of Quantity of Production Work Where the amount of production work has become so great as to be affecting teaching efficiency adversely, the most obvious procedure to use in controlling the production work problem is to reduce the amount of the work. Immediate refusal of further work orders may not be wise. Publicity designed to show that industrial arts is more than "manual training", or "busy-work", or an activity for the sub-normal boy should be tactfully initiated. This publicity must interpret the objective of industrial arts and may be obtained through newspaper articles; exhibits with descriptive placards; radio programs by students; and auditorium periods. The campaign should show that vital instruction is being given and that something more than the construction of projects is occupying the boys' time. The publicity program must show that the shop really contributes in a significant way to many basic attitudes and appreciations of social and cultural value. Some means must be used to indicate what the project has done to the boy, rather than what the boy has done to the project.

Thus, by educating the people who seek to have production work done by the shop pupils and by obtaining understanding of the real objectives of industrial arts education, a better control over the
number of work orders may result.

One immediate step that the shop teacher may take to reduce the amount of production work is to limit number of people who may come to the shop to order the work. More than half of the woodworking teachers in California high schools, as shown by this study, have permitted any person to come directly to the shop and order the work he wanted done. Such an interruption of class instruction would never be permitted in any academic class; and continuing such a practice in the woodshops can but lead to disparagement of the industrial arts program as a whole.

The time when production work may be ordered should be restricted. That such restriction is needed is indicated by the data in the study, showing that over three fourths of the teachers permitted their teaching time to be disrupted by production work "customers".

Reducing the number of people who may order work done, and also restricting the time when they may come, may be accomplished by having all orders pass through the office of some school official or department head for first consideration before reaching the teacher. Initial administrative approval will reduce the amount
of class interruption by eliminating many of the "tinker" type of jobs that are constantly brought to the shop. Many of these small but time consuming jobs might not be accepted if the work were routed through the office and ordered in a systematic manner. Those who ask that such small jobs be done may be sufficiently discouraged by this requirement and thus begin to do their own repairing.

The Organization of the Work Through Administrative Co-operation: A work order form to be used by the administrative officer to systematize the work is shown, page 57 (Form I): All work orders under this system are to be written out in duplicate and a copy properly filed with the school office or department head. The second copy becomes the requisition. It is signed by the administrative officer, if approved; and the customer presents it to the shop teacher for cost and time estimates. The shop teacher places the requisition in proper sequence in his work order book and notifies the customer of both or of his rejection of the job. Some exceptions in work sequence may be necessary, but only when the department head or the school office specifically asks that certain work orders shall have preference over others. These exceptions
**PRODUCTION WORK ORDER**

<table>
<thead>
<tr>
<th>Requisition No</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Work Order No</td>
<td>Date Wanted</td>
</tr>
<tr>
<td>Requested by</td>
<td>Dep't</td>
</tr>
<tr>
<td>Work to be done by</td>
<td>Department</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Material to be paid for by</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate pupil-hours</td>
<td>Approximate teacher-hrs</td>
</tr>
<tr>
<td>Students assigned</td>
<td></td>
</tr>
</tbody>
</table>

**Bill of Materials**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
</table>

Approved................................
should be kept at a minimum, or the purpose of the order sequence will be defeated.

To provide a uniform method for ordering production work, copies of an instruction sheet should be given to those who may have occasion to order such work. A suggested instruction sheet is given on the next page.
Procedure for Obtaining Materials or Projects from Industrial Arts Shops
(For School Personnel)

1. Make written request in principal's office

2. Fill in the work order blank and have approved

3. Leave requisition in mail box of the teacher who is to direct the work

4. If additional information is necessary, use more paper for sketching or explanation, but fasten sheets of instruction together.

5. Since it is not always possible to do production work immediately teachers should place orders as far in advance as possible.

6. If the work cannot be brought to the shop, please indicate on the request form the day and the time when the work may be done.

7. In making your requisitions for the school year, include all the work you expect the shops to do. If this is done in the spring, it will enable the shop instructors to arrange their work better, prevent hurry-up jobs, or inability to complete the work.

8. Please do not send any student to the shop unless it is absolutely necessary and make sure that he knows the purpose of his errand.
Teachers requesting production work should know in advance what they will require from the shop, and thus make their requests in the spring along with their other requests and specifications for supplies or equipment. Their using the production-work order form for such work will enable the shop teacher to organize his work and to estimate the time he must devote to the job. Also it will enable him to place the work with the student groups best fitted to do the work, and he will be able to introduce the work when it can best be integrated with the course of study.

Ever increasing authority should be given the teacher to reject work that provides no educational content. Many rush orders, as well as orders for work that are too repetitional in character should become more and more subject to the teacher's rejection.

The Considerations of Class and Student Where classes are organized to do production work those who elect such courses should understand that they may work on their own projects, only when there are no orders for production work. Only advanced students who are more interested in increasing skill, and technical knowledge should be enrolled in special production classes. The class must have its work
carefully organized to prevent defeat of the industrial arts objectives. Distributing the production work in regular woodworking classes by requiring all boys to spend a limited number of days on production work will help prevent exploitation of any of the more willing, capable, or impecunious boys. When the students know in advance that they may be called upon to do a limited amount of production work, disagreeable incidents or attitudes will be diminished. Students wishing to work more than the maximum number of days required, may do so with the teacher's permission, and at a convenient time.

The amount of pupil time to be spent on production work by the regular classes should be estimated at the beginning of the school year. This estimate may be based on the amount of time required in the previous year.

After the approximate number of total hours for the work is estimated, it will be simple to determine maximum number of hours which each student in those classes must devote to such work. If, as the averages for all schools show, the amount of time needed to do all the production work is 14 per cent of the total time, then 14 per cent of the total days in a school year should be the number of days which each student
must devote to production work. Fourteen per cent of 180 days - (the estimated number of full days in a school year in California) - is about twenty-two days, if all classes are used on this work. If fewer classes are used on production work, a greater number of days must be devoted to this work. Whatever number of days is determined as the maximum for each student to spend on production work, some method of checking and recording the amount of time which students devote to production work must be established. A suggested form for such record is given below.
Each student should keep a record of each day unless a foreman system is used, when the shop foreman may fill in the sheet. The teacher should check the record sheets each day to prevent errors and inaccuracies.
If the production work is of a repetitional nature and adapted to quantity production methods, some teachers find it advisable to do the production work during the first part of each semester, so that machine instruction may be given to groups working on each machine. These groups are rotated from one machine to another, so that, by the time the students are ready to begin their own projects, they have had both instruction and practice on the machines they will use for their own work. Wood (12: 246-247) suggested this method.

As shown in the study, a few teachers reported that their production work was done in the spring of the year when the boys had completed their own projects and had received other instruction. Production work was also done by students who had completed their own projects, and had insufficient time to start a new project. White (11:370) suggested concentrating the instructional materials of the advanced shop courses into a shorter period of time at the beginning of each semester so that some time would be reserved for production work.

The use of either or both of the above methods of concentrating the production work within a limited
period of time has some merit, but care must be ex-
ercised to prevent a loss of pupil interest in the
work.

To secure some of the benefits that accrue from
experiences with production work, Erickson (7:224)
and LaBerge (8:36-41) suggest similar solutions. They
suggest that the teachers reduce the number and types
of projects that students may wish to make for them-
selves to three or four. After the selection is made
by the pupil, the production methods of getting out
the rough stock for this limited number of projects is
feasible. The rough stock is then cut out, and each
student takes the partially milled units of his pro-
ject and completes it individually.

If production work must be done, in the school
shop, the teacher should motivate the instruction as
much as possible so that the student interest is con-
stantly retained. The factory production methods will
have some appeal to most boys. On some production
jobs, it is possible to engender the spirit of com-
petition between groups of boys working on different
machines. This competition may arise from the desire
to do better work, or to accomplish more work on a
machine in a given time.
When the students know that the production work they do is appreciated, they take more interest in it. Every effort should then be made to give recognition for the work they do. Favorable publicity in the school paper may be helpful, but the teacher must use the greatest discretion in using this method, or there may be a demand for more work which is the result that most teachers are trying to avoid.
CHAPTER V

BIBLIOGRAPHY


CHAPTER VI

APPENDICES
## Group I

### Question

1. Average size of classes .................. 23.25
2. Average number of classes per day .......... 4.79
3. Average minutes per class per day .......... 56.62
4. Totals for class distribution of production work:

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Some</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational woodworking</td>
<td>6</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>General shop I</td>
<td>2</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Woodwork I</td>
<td>1</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Woodwork III</td>
<td>18</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Woodwork IV</td>
<td>1</td>
<td>12</td>
<td>2</td>
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<tr>
<td>Special classes specifically organized to do production work</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Teacher</td>
<td>2</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

## Group II

### Question

1. Average size of classes .................. 25.42
2. Average number of classes per day .......... 5.04
3. Average minutes per class per day .......... 58.81
4. Totals for class distribution of production work:

<table>
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<tr>
<th></th>
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<th>Some</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational woodworking</td>
<td>6</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>General Shop I</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Woodwork I</td>
<td>7</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Woodwork II</td>
<td>1</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>Woodwork III</td>
<td>1</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Woodwork IV</td>
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<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Special classes specifically organized to do production work</td>
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<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Teacher</td>
<td>8</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Others</td>
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</table>
Both Groups

Question

1. Average size of classes.................................. 24.38
2. Average number of classes per day........ 4.92
3. Average minutes per class per day........... 57.76
4. Totals for class distribution of production work:
   Vocational woodworking.................. No Some All
   General shop I......................... 4 12 2
   Woodwork I.............................. 9 25 1
   Woodwork II............................ 2 41 1
   Woodwork III......................... 1 38 3
   Woodwork IV............................ 2 28 5
   Special classes specifically organized to do production work
   work........................................... 4 5 5
   Teacher..................................... 10 15
   Others..................................... 7 10 2
Group I

5. Do students financially unable to buy materials for their own projects do more of the production work than other students? .......... 13 12

7. Who determines the amount of production work to be done in your shop?

Prin. Teach. Both Need

3 15 3 2

(One said, "not determined")

8. Do you provide time for production work in your course of study? ......... 14 10

9. Approximately how many teacher-hours do you devote to all phases of production work? ............... Avg. 7.19

11. Should production work be done only for the school? .............. 12 11

12. Do all orders for production work pass through the office of the principal or the superintendent? 9 15

14. Is everyone in the school permitted to come directly to the woodshop to order work they desire? ............... 15 9

16. Do you rotate the groups working on production work? ............... 10 14

17. Do you occasionally find it necessary to do production work on Saturdays or Holidays? ............... 12 11

Group II

5. Do students financially unable to buy materials for their own projects do more of the production work than other students? ............... 17 9
Group II (Con't.)

7. Who determines the amount of production work to be done in your shop?  Prin.  Teach.  Both Need 4  16  5  1

8. Do you provide time for production work in your course of study?                      Yes  No  12  14

9. Approximately how many teacher-hours do you devote to all phases of production work? Avg. 8.64
(One said, "Such a figure would be only a guess")

11. Should production work be done only for the school?                        Yes  No  17  7

12. Do all orders for production work pass through the office of the principal or the superintendent?  14  11

14. Is everyone in the school permitted to come directly to the woodshop to order work they desire?  11  14

16. Do you rotate the groups working on production work?                      9  16

17. Do you occasionally find it necessary to do production work on Saturdays or Holidays?        4  21

Both Groups

5. Do students financially unable to buy materials for their own projects do more of the production work than other students?  30  20
Both Groups (Con'd)

7. Who determines the amount of production work to be done in your shop.............................Prin. Teach. Both Need
    7 31 8 2

8. Do you provide time for production work in your course of study?.................................Yes No
    26 24

9. Approximately how many teacher-hours do you devote to all phases of production work?............Avg. 7.9

11. Should production work be done only for the school?..............Yes No
    29 18

12. Do all orders for production work pass through the office of the principal or the superintendent?.. 23 26

14. Is everyone in the school permitted to come directly to the woodshop to order work they desire?.... 26 23

16. Do you rotate the groups working on production work?...............19 30

17. Do you occasionally find it necessary to do production work on Saturdays or Holidays?.............16 32
Group I

Question

10. Definite numerical answers on:

<table>
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<th></th>
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<td>Scenery for dramatics</td>
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<td>P.E. Equipment</td>
<td>21</td>
<td>5,856</td>
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<td>Instructional materials</td>
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<tr>
<td>Shop equipment</td>
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<td>4,202</td>
<td>200.1</td>
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<td>1,230</td>
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<tr>
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<td>17</td>
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Group II

10. Definite numerical answers on:

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<tr>
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Both Groups

10. Definite numerical answers on:

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</tr>
<tr>
<td>Instructional materials</td>
<td>33</td>
<td>8,710</td>
<td>265.9</td>
</tr>
<tr>
<td>Shop equipment</td>
<td>38</td>
<td>7,677</td>
<td>202.0</td>
</tr>
<tr>
<td>Parade floats</td>
<td>5</td>
<td>1,430</td>
<td>286.0</td>
</tr>
<tr>
<td>Others</td>
<td>28</td>
<td>17,167</td>
<td>613.1</td>
</tr>
</tbody>
</table>

*Atypical reports              | 2    | 23,800 |

*One school reported 17,000 total hours, but did not divide into types of construction.
Another school did not divide into types of construc-
tion, but gave sufficient data to estimate total hours to be 6,600.

Group I

6. Do most students prefer doing production work to working on their own projects? .......................... 1 21
   (One said, "I don't know")

13. Is part of your teaching time taken up with those who come to the shop to explain the production work they want done? .......................... 20 4

15. Does production work ever disrupt your regular teaching procedure? ...... 19 5

18. The Industrial Arts program could be better carried out if there were (less) (more) (no) production work to be done...... Less More No O.K.

          14  2  3  1

Group II

6. Do most students prefer doing production work to working on their own projects? .................. 4 21

13. Is part of your teaching time taken up with those who come to the shop to explain the production work they want done? .......................... 18 6

15. Does production work ever disrupt your regular teaching procedure? ...... 18 7

18. The industrial Arts program could be better carried out if there were (less) (more) (no) production work to be done...................... Less More No O.K.

           5  0  9  9
Both Groups

6. Do most students prefer doing production work to working on their own projects? .............. 5 42

13. Is part of your teaching time taken up with those who come to the shop to explain the production work they want done?........ 38 10

15. Does production work ever disrupt your regular teaching procedure? 37 12

18. The Industrial Arts program could be better carried out if there were (less) (more) (no) production work to be done.........

Group I

19. Do you consider production work to be "child exploitation"?..... 9 15

20. Do you desire a summary of this study................................. 24

Group II

19. Do you consider production work to be "child exploitation"?..... 9 16

20. Do you desire a summary of this study?................................. 22 2

In all instances where the sum of the answers does not equal 26, the question was not answered, or the answer was one that could not be definitely tabulated.
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Do you consider production work to be &quot;child exploitation&quot;?</td>
<td>18</td>
<td>31</td>
</tr>
<tr>
<td>20. Do you desire a summary of this study?</td>
<td>46</td>
<td>2</td>
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</table>
One of the common problems faced by industrial arts teachers is that of production work in the industrial arts woodworking shop. I would greatly appreciate your responses to a few questions concerning a study of that problem.

By production work, is meant the making of articles for the school, or the repair of school property. Such work may include making tables, benches, stage scenery, bleachers, shelves; or repairing chairs, refinishing, furniture, fitting handles, and other similar repair jobs.

This study will be devoted to three phases of the production work problem: (1) How extensive is the problem? (2) How are industrial arts teachers meeting the problem? (3) What are the opinions of teachers on some phases of the problem?

I am enclosing a mimeographed plan for a woodworking project which you may be able to use, and I trust that this may partly compensate you for the time you take to answer the questionnaire.

An extra copy of the questionnaire is enclosed for your files, and I shall be glad to inform you of the results of the study as soon as it is completed. Your co-operation and prompt response will be of great assistance in this study.

Very sincerely yours,

Woodshop Instructor
Yuba City Union H.S.
Yuba City, California
A STUDY OF PRODUCTION WORK IN SENIOR HIGH SCHOOL
INDUSTRIAL ARTS WOODWORK CLASSES

If you do production work in your shop, please fill in the data requested as accurately as possible.

1. What is the average size of your industrial arts woodworking classes? (___________)

2. How many classes in industrial arts woodworking do you have daily? (___________)

3. What is the average length of each period in minutes? (___________)

4. Please indicate which of the following do no production work, which do some, and which do all production work:

   Vocational woodworking—(no) (some) (all)
   General shop I.............(no) (some) (all)
   Woodwork I.................(no) (some) (all)
   Woodwork II................(no) (some) (all)
   Woodwork III..............(no) (some) (all)
   Woodwork IV..............(no) (some) (all)
   Special advanced classes
      specifically organized to
      do production work.......(no) (some) (all)
   Teacher....................(no) (some) (all)
   Others.....................(no) (some) (all)
   ..........................................(no) (some) (all)

5. Do students financially unable to buy materials of their own projects do more of the production work than other students? (yes) (no)

6. Do most students prefer doing production work to working on their own projects? (yes) (no)

7. Who determines the amount of production work done in your shop? (___________)
8. Do you provide time for production work in your course of study?   (yes)   (no)

9. Approximately how many teacher-hours per week do you devote to all phases of production work?   .................................................................

10. Please check below the production work projects which have been made in your shop during the past year, and give the time required:

   Approximate pupil-hours involved

   Furniture........................(____________________)
   Scenery for dramatics(____________________)
   Equipment for Physical Education.......(____________________)
   Instructional material for school departments...........(____________________)
   Equipment for the shops...................(____________________)
   Parade floats...........(____________________)
   Others...................(____________________)

11. Do you believe that production work should be done only for the school?......... (yes)   (no)

12. Do all orders for production work pass through the office of the principal or the superintendent?...................... (yes)   (no)

13. Is part of your teaching time taken up with those who come to the shop to explain the production work they want done?....(yes)   (no)

14. Is everyone in the school permitted to come directly to the woodshop to order work they desire?.........................(yes)   (no)

15. Does production work ever disrupt your regular teaching procedures?.......(yes)   (no)
16. Do you rotate the groups working on production work so that approximately the same amount of time is spent by each student on this type of work?..............(yes)  (no)

17. Do you occasionally find it necessary to do production work on Saturdays or Holidays? (yes)  (no)

18. If there were (less) (more) (no) production work to be done you could carry out the industrial arts program better. Check one.

19. Do you consider production work to be "child exploitation"?...............(yes)  (no)

20. Do you desire a summary of this study?  (yes)  (no)

Name..............................

School..............................

City, State.........................