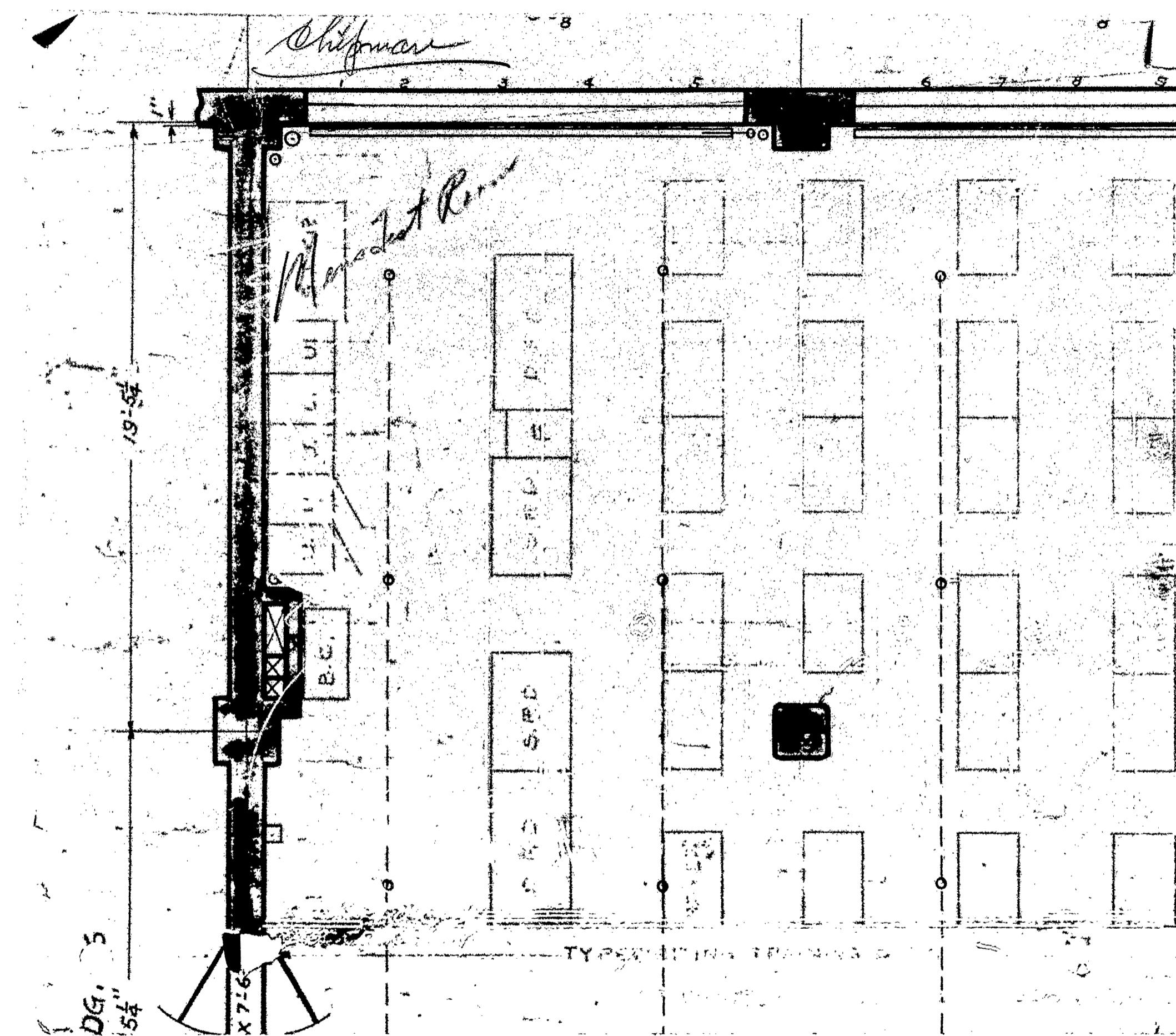
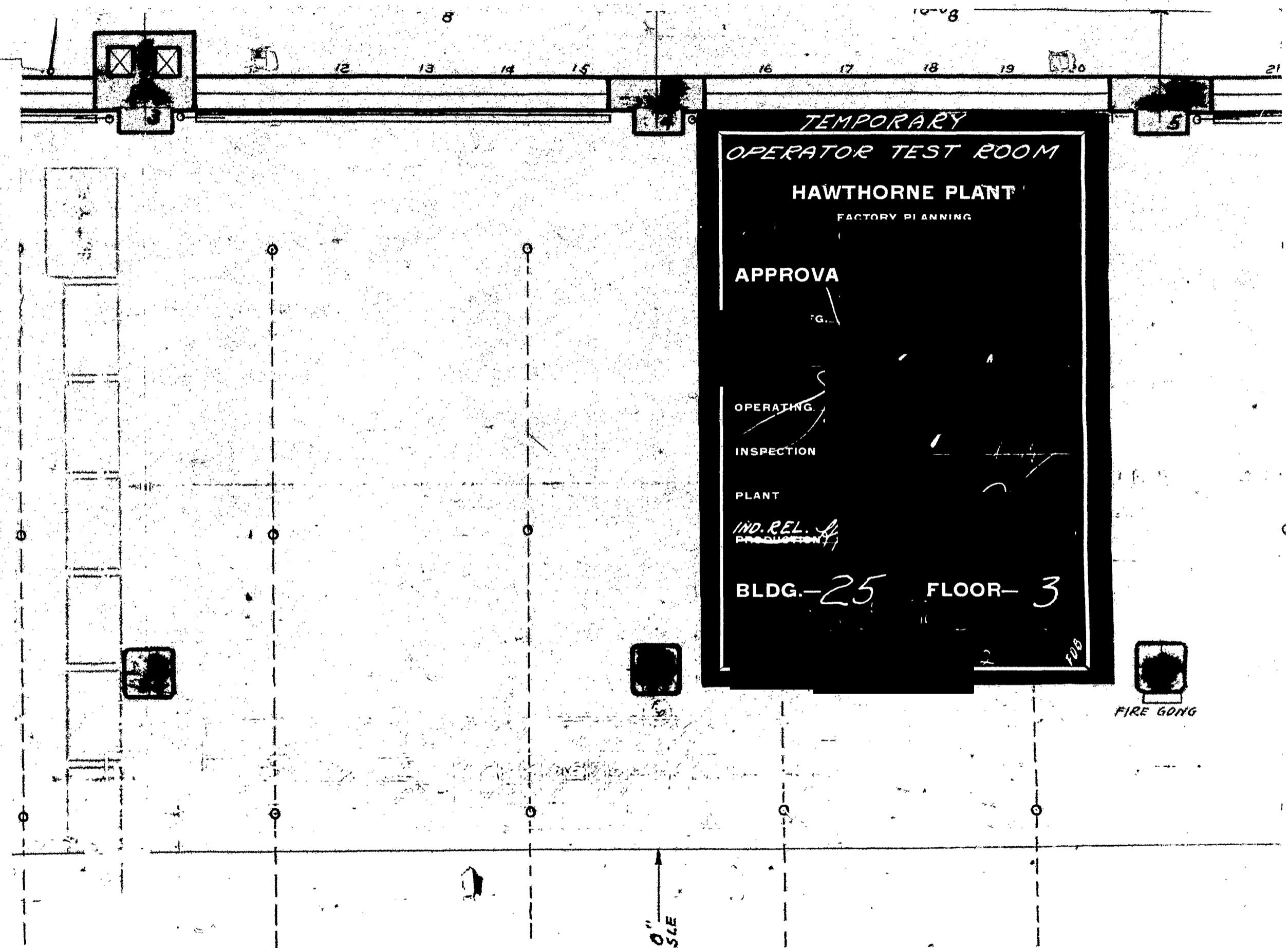


SELECTOR BANK WIREMEN
PROPOSAL FOR TEST ROOM GROUP OF MALE OPERATORS

21 pp

May, 1931





File - Your file

DON'T DISCLOSE IDENTITIES

From the beginning of these studies, the identities of the persons under study have been kept confidential. We look to you to carry on this trust. Please guard the privacy of the persons involved by substituting fictitious names, or code symbols for real names.

May 11, 1931.

MR. H. S. WOLFF - 6360:

Subject: Test Room Group of Male Operators -
Selectable Bank Wiremen - Dept. 6347.

The establishment of a test room study group of wiremen selected from your organization, Department 6347, involves certain plans and arrangements which you will no doubt wish to give some preliminary consideration.

In the recent discussion between yourself and Messrs. Putnam, Wright, and Hibarger, the tentative outline of the study was presented. At that time it was understood that we would prepare a more complete account of our proposed activities so that you could offer any suggestions or criticisms which would be mutually beneficial.

In general our activities will center around the employee and his reactions and adjustments to his working situation. We will keep records which will assist in determining the kinds and degrees of reactions and adjustments the man makes toward his working situation and toward his outside situations as these are reflected in his production, attendance, and in his physical and mental status.

In conducting research of this nature, we are primarily interested in the individual, and the question of supervision, therefore, becomes an important one. In this connection we will assume that the employee knows what is expected of him and will conduct himself accordingly. Should this prove fabrication and it become apparent that some special consideration is needed to improve the conduct of some individual, both from a behavior and a production viewpoint, we would want to investigate the reason for such inappropriate conduct before considering a reprimand or even admonition. In other words, we are interested in finding and treating the cause of trouble rather than finding a remedy for treating the symptom.

The question of production and schedules and schedule dates, in short, the mechanics of output, is largely one of secondary consideration, but in this connection it will probably be best to coordinate our activities to the end that a duplication of effort does not result and the present unsatisfactory arrangement is not disturbed.

MR. H. S. VOLITZ,

2.

May 11, 1931.

As you know, the test room will be located in a not too remote location from the regular department and to date the tentative selection is in the northeast corner of Building 25-2. This location will require a minimum amount of trucking of material and finished work and the trucking expense incurred will be taken care of by allowing this payment factor for this item to remain in the departmental rate. In fact, all allowances ordinarily included in a group rate for items such as supervision, new help, partsmen, etc., will remain in the regular departmental rate, and the only item included in the test room rate will be the amount paid for the actual assembly or wiring unit.

For purposes of differentiation between the test room group and the regular departmental group, it is planned to designate the test room group as Group No. 2. This will insure a more satisfactory method in respect to our records of individual production, efficiency, and earnings, and will permit of a more definite contrast between the two groups should you decide to make this comparison as you mentioned during our discussion. However, before you begin a comparison of this kind, we would appreciate discussing the proposition a little further, since our experience in a similar arrangement, where one group acted as the study group and another the "control" group, was rather unsatisfactory.

The test room group will consist of six wiremen, two soldermen, and two inspectors. In this set-up the day work value of the group will not include the two inspectors, but only the immediate members of your organization. In a group so small as this, the absence of one member would cause a considerable drop in the piece work percentage, which would be a disturbing factor to other members of the group. We would like to guard against absences as far as the group is concerned by using a substitute operator whenever a regular member is absent. If the absence is not longer than one-half day, we could obtain a substitute from the regular department without transferring his time from one group to another. If the absence is for a day or longer, it would probably be best to transfer the substitute temporarily, this practice we have followed in the Relay Assembly Test Room.

The choice of members of the group will not be made on any predetermined basis. In choosing these people there are several things which should be considered. We would like some indication of their permanence with the Company. This can best be determined by what is already known about them and by an interview with each one a little later. We would not make any deliberate selection of these people on the basis of their respective efficiencies, since to do so would tend to introduce

MR. H. S. WOLFF,

3.

May 11, 1951.

a questionable factor. The better way, no doubt, would be to select some one or two individuals in whom your knowledge is sufficient to indicate their desirability to participate in the study, explain the entire project to these two and suggest that they select the other members with whom they would want to associate in a study of this kind.

After the group has been selected, we will take them into conference and explain in full what it is we are intending to do. Any questions they may care to ask will be fully answered and if any one does not care to accept the proposition, he will be excused and another candidate chosen.

The group should remain intact throughout the entire study but should a member be absent for a day or more, it would be necessary to obtain a substitute.

We shall probably want to give them a rather complete physical examination at the beginning and additional examinations periodically during the course of the study as the conditions dictate.

In the foregoing we have attempted to present some of the questions or problems as we see them. In the following account of our survey other factors are presented. However, there are doubtless a number of questions which we are not in a position to recognize and which you will probably want to include. Other questions will, no doubt, arise as the study progresses which we would want to discuss with you.

The accompanying folder presents the detailed account of the specific factors we have included during our survey of the job, and we are passing this along for your consideration. Any suggestions or criticisms you care to make will be appreciated.

M. L. PUTNAM - 6086.

HIVEL

File - 2088-3

*The check is done
should be for about
the [redacted] general fees,
to keep work on schedule, or at [redacted]
[redacted]*

March 30, 1931.

[redacted]
- 6088-3:

I believe that we may say that the following principle has evolved from our association with the armature straightening test study and the line organizations that have been responsible for the maintenance of a quality standard:

When future selections are made of groups of operating individuals for test study purposes, we should attempt to obtain a job, the quality limits of which are stated very concisely, these limits being measured with gauges or having predetermined values of long standing.

When it is advantageous for us to choose a job, the quality limits of which are very flexible, i.e. subject to the judgment of a number of individuals, we shall attempt to place the individual who is responsible for the maintenance of quality in the test group, under the direct or indirect supervision of the Research study representatives in charge of this test.

[redacted]
- 6088-3A.

DAC:SV

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September 25, 1931.

MR. H. S. WOLFF - 65604

Subject: Changes in Test Room Plans.

In a memorandum to you on May 11, we outlined the procedure and some of the problems of establishing the new experimental study with connector bank wiremen from Department 6547. Our subsequent conference with you brought up several questions centering, for the most part, about the advisability of creating different working conditions in the test room from those which prevail in the regular department. It was your opinion that as few changes should be made as possible if our results are to be at all applicable to normal work situations. Among other things you pointed out:

- (1) That the work benches should be laid out just as they are in the regular department, and that the operators be moved around as they are there.
- (2) That the group be subject to the same conditions which attend changes in the work schedules of the department.
- (3) That supervisory pressure be exerted if necessary.
- (4) That the difficulties involved in substituting for an absent test room operator make that practice impractical.

Since talking these points over with you, we have formulated a new approach to the study which fits in very well with your point of view. We believe we can learn more by keeping these men in a work situation as nearly identical with the regular department as possible. For this reason we suggest that the study group not be placed upon a special gang rate but rather that they continue to share in the departmental earnings. We also believe that they should continue under their present supervision. As we see it now, the only differences will be that the group will be segregated in a room and their production will be accurately recorded. As the research

MR. H. S. WOLFF - 6360:

2.

September 25, 1941.

In our present state of progress it may be necessary to introduce changes which are not present in the department, but for the present we think the procedure outlined is advisable.

We should like to know if these modifications meet with your approval.

H. Wolff - 6360-1.

END:EL

*File
Circumstances filled
and from (date given)
subject to check to name of supervisor*

**SURVEY OF
TEST ROOM GROUP
MALE OPERATORS**

In connection with the establishment of a test room group of male operators we are considering the wiring and soldering operation, of the bank equipment terminals used in the Step-by-Step apparatus.

There are three pieces of this equipment which are; the line finders, the selectors, and the connectors, and are manufactured in department 6547, building 27-3.

In a preliminary survey of the situation, it was noted that irrespective of the class of equipment we selected for our purpose, certain advantages and disadvantages would be present.

Because of this we feel that a more complete survey should be made before proceeding with any permanent arrangements.

In making this survey a certain amount of empirical information will be obtained, which will assist in the ultimate selection. In addition there are a number of factors of a definite nature which should be investigated. We have divided these factors into four general divisions, and are listing under each division the related items for investigation as follows:

I: Production Factors

A. General Work Arrangement for each type of equipment.

1. Units per bench; units per operator.
2. Space requirements per unit.
3. Component parts entering assembly.

4. Where parts are made ready for assembly (Mfg.)
5. Are parts obtained by operator or is he serviced?
6. Finished work removed by operator or is he serviced?
7. Approximate time required to finish.
8. Delivered to ____? Are immediate deliveries possible or is there delivery ticket delay?
9. Amount of time between completion of one unit and beginning of the next.
10. What is the sequence of operations. (Obtain copy of the layout.)
11. Wiring - proportionate amount of time.
12. Soldering. " " "
13. Inspecting - Amount of time. Number of inspectors required.
14. Repairing - By whom and when? Amount of time?
15. Can wiring operator do the soldering, or is an independent operator necessary? (Selectors or Connectors.)
16. Schedules for each type of equipment? (Selectors, Connectors, Line Finders)
17. Can we keep ten individuals supplied with work?

B. Rate Factors

1. Is unit now assembled on a separate rate? If not is it a specific unit of the gang rate?
2. Can the unit rate be divided to suit our purpose?
3. Can wiring and soldering be included in the unit rate for selectors or connectors, allowing the same individual to perform the complete operation?

4. Should the rate include the inspector? (Seems unavoidable from the operating standpoint, since they would be unwilling to carry his expense and not receive his services. From our standpoint, the earnings might increase sufficiently to offer an incentive for the same personality to remain on the test room inspection, if he were sharing in the group earnings.)
5. Possible disadvantage of the inspector in our rate might be the tendency to become lax.

II. Personnel Factors

A. General

1. Age of the operators.
2. Responsibilities of operators; married, dependents?
3. Labor turnover - Advancement to higher grade of work or supervisory job. (Is this an item?)
4. Average education or intelligence?

B. Investigation of Individuals Tentatively Selected.

1. Attendance.
2. Reasons for irregularities?
3. Personnel Record; Length of service; with Company; on the job?
4. Employee's future; Return to school; Transfers?

III. Records

A. Maintained in Department

1. Production records - Are these suitable for the establishment of base period figures?
2. Repair records - Can we obtain the amount of time spent in repairing?

3. Can we get accurate efficiency records?

4. Who establishes the bogey or task rate?

B. Test Room Records

1. Possibility of recording comparable units of output by units of time. (Half hourly or hourly.)
2. Possibility of obtaining a quality record. (Can this be obtained from present operating records, can the inspection organization furnish us this information or can we set up a record to be maintained by the inspector? - To be comparable with the production records as regards time intervals.
3. Can we get a record of the total time per individual for interruptions; visiting - washroom - other non-productive times?

IV. Job Peculiarities

- a. Does work progress uniformly so that each hourly count (exclusive of personal time) is a satisfactory record of individual effort or application.
- b. How much evidence of conscious, or unconscious, retarded output is exhibited? (Controlled production.)
- c. What development changes are contemplated for each unit (selector, connector, line finder) and when will these occur.

(D) Possibility of particular counter:

Provided, we have available, some individual who can devote his time to making this survey, it is estimated that one month will be required.

MM:BL

Not to be distributed

July 10, 1968.

MEMORANDUM
A Preliminary Description of
the Problems Involved in Conducting
Luring the Early Stages of
Cannibalistic Fishes - Department of
Marine Sciences - Department of CCM.

The purpose of this memorandum is to outline the objectives, method of approach, and organization of the contemplated study. Much of the research problem involved will be concerned with the development of new techniques and methods. It is believed that the problems discussed should be studied as completely as possible, so that the ultimate objective of cannibalism can be determined. It is believed that only in this way can we hope to gain a better understanding of the nature of cannibalism in fishes and its possible ramifications.

1. Introduction

A brief description of the study will be given, followed by the objectives and methods to be used. This will be followed by a discussion of the literature on cannibalism in fishes, and finally some general conclusions will be drawn. The results will be presented in a general discussion. It is well to note that this paper will be brief.

There are two main types of cannibalism in fishes. One is a study of the diet. A brief review of the need to study diet in addition to growth - in the case of cannibalism. It will be discussed first.

2.1 To be assured that all our experiments will have been conducted with female specimens and that our findings are not apply to male specimens. Research on the effects of sex on cannibalism. In the case of cannibalism, it is found to be 2.5 to 1, and females would be of value to the

Different test
to begin with.
May become
a little tiring

July 10, 1951.

Company. It is further suggested that the motivating forces may be different for the sexes. They may require different kinds of supervision, rest periods, etc.

There may or may not be sufficient evidence for such conclusions. The test-room findings concerning mental attitudes, ratios, work curves, and supervision seem to be applicable to both sexes alike. Having physiological sex differences, there is no more difference between the situations of men and women than between those of men and men or women and women.

In view of the fact that nothing very definite is known about these things and that there are current and widespread prejudices and practices based upon an assumed physiological and psychological difference in the sexes, it does seem advisable to obtain more exact knowledge in this area.

T. Clark

1.3 The primary reason for this study might be stated as the need of obtaining more complete knowledge about what took place in the Safety Assembly experimental group. More exactly, we need to ascertain the precise relationship between employee attitudes and their effectiveness. The conclusion that there is a direct relationship between them is the most significant one arrived at in these studies and the one most in need of additional verification.

1.4 A third reason for selecting a new group is that study materials can be revised with less probability of their being falsified by the two subjects. It is probable that people who have been experimenting with our a period of years might not react to an invitation with the spontaneity of the average person. A further reason is that the interpretation of a method, to be discussed later, designed to turn all facts into consideration, should take place at the start of the study; otherwise the investigation will always have to speculate upon what has transpired before. This point will be further clarified in the following discussion of method.

2. A Discussion of Method.

It may be, as Professor Martin contends, that our approach to the new study group differs from that employed in the Safety Assembly group not as much in method as in point of view. I believe, however, that the point of view from which one looks at and interprets the facts is more significant than the mere method.

July 10, 1952.

of obtaining them. The former indicates the gaps in one's knowledge and points to revision of methods. Feeling that there is a fundamental difference in our approach to this new study as compared with studies in progress, I shall attempt, by noting their similarities and differences, to make this distinction clear.

2.1 Similarities.

- 2.11 The research is continuous.
- 2.12 Production is looked upon as a function of each individual's total situation, and is, therefore, the most important single record to be kept.
- 2.13 There is an observer whose function is that of recording significant happenings and keeping down employees' comments from time to time. (There will be some alteration of this function in the newer study which will be stated later.)
- 2.14 Employees are given periodic health examinations.
- 2.15 Other records - health, attendance, quality of work, etc. - the same.

2.2 Differences.

- 2.21 The essential feature of the method followed in the Policy Assembly group is that of introducing major changes and attempting to measure the results in terms of production, health, and mental attitude.
- 2.22 In the Connector Wires group, major changes will not be introduced. The only significant changes will be (1) introducing a mechanical recorder of production, and (2) segregation in a test room.
- 2.23 Emphasis in the Policy Assembly group was placed upon technological changes - pay incentive, hours of work, and rest periods. Personnel and mental changes were not considered significant until their importance emerged from the study.

| Do not check.
H.A.

July 10, 1952.

In the Connector Division group, attention will be directed chiefly toward social and individual changes. Changes in technological factors will follow changes in the department from which the group comes. If these changes are so varied that they tend to upset the results they will be rigidly controlled and kept constant.

By technological changes we mean such things as changes in equipment, hours of work, rest periods, illumination, temperature, and work habits.

By social changes we mean changes in the relationships among the operators and supervisory relationships. The formation of group organizations and solidarities fall in this category.

By individual change is meant, primarily, changes in mental attitude. It can occur may times in the individual because about by experience, education, or external circumstances.

2.00 The Policy Assembly group was placed in an artificial situation. Factors which contributed to this artificiality are listed by Mr. Chapman as:

- 2.00 1 Supervision - kind and amount.
- 2.00 2 Meetings - small group discussions.
- 2.00 3 Working environment - being in evidence away from division. Having a certain pride in virtue of own working space.
- 2.00 4 Influence of authority at job.
- 2.00 5 Work periods.
- 2.00 6 Attention shown the group - by executives of Company and distinguished visitors.
- 2.00 7 By work conditions in attempting to provide the most favorable working conditions.
- 2.00 8 Uninterrupted flow of work.
- 2.00 9 Relation of officials and leaders.
- 2.00 10 Association - continuous association with familiar operators and tool directors.
- 2.00 11 Small number of changes in type - consideration especially of first type (I and II).
- 2.00 12 Small number of layout changes.

July 10, 1941.

The Connector Payment group will remain in a situation as nearly like their regular department as possible. Ideally, this group might be looked upon as a section of the regular department which has been segregated to facilitate observation and study. The only variables will be the two already stated. (1) Continuous reward of output, (2) segregation in an enclosure, and the knowledge that they have been selected for study. The first two can be rather objectively controlled by (1) a central group in the regular department, and (2) by introducing the changes separately and allowing sufficient time for them to work out. The third can be ascertained by finding out what it means to the operators by interviewing them.

Supervision will remain the same as in the department. Operators will report to their regular gang boss and he will be allowed to say what he likes to them. The supervisor may not act as he usually does because of his concern of the situation, but the supervisory-employee relationship is too important to be omitted, even if it is somewhat altered. With the supervisor's voluntary help we will readily have a miniature department. Our understanding of this relationship will come by (1) interviewing the supervisor periodically, (2) noting everything he says and does while in the test room, and (3) by interviewing all employees who report to him, both in and out of the work room.

The operators selected for study will share in the regular gang earnings. This avoids the difficulties attendant upon making a special pay rate and also permits the use of the regular supervisor who is paid out of the gang earnings. A small gang cannot pay for a supervisor.

The factor of recognition will be controlled by keeping visitors and higher officials out of the work room. Preventative measures will also be taken to prevent any undue security.

2.04 The research functions in the Connector Payment group are two - observing and interviewing.

The observer will be stationed in the room with the operators. It will be his function to record conversation of the employees which seems to be significant, observe evidence of antagonism or solidarity which are directly or indirectly connected, note individual peculiarities, and keep an accurate record of daily events. Some of his time might be spent in compiling records, but it is quite probable that the functions mentioned will occupy his time. It might be well at this

*but be natural
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July 10, 1941.

tive to endeavoring the necessity of getting a trained man for this position. The importance of his task becomes clear when we remember that the things he records as significant must in fact be significant. It is impossible for a person to record everything that transpires in a group of this size - he must be selective. It is here that the observer's skill comes in. An ideal observer is not one who can make a hasty picture of a situation, but rather one who can select the significant things in the situation and tell what they mean.

Since the observer will obtain the indirect content of the members' thoughts and actions, the interviewer will look for their latent content. It is, therefore, essential that the interview be formalized, i.e., the should be held by appointment in a suitable location. The interviewer should try to keep himself in the position of an observer to the people in the other group. Otherwise the interview is likely to degenerate into a series of casual meetings. It will become him, therefore, to keep away from the group as much as possible. Because of the nature of his work the interviewer should be furnished with all the relevant data pertaining to each individual. Since the observer and the interviewer must try not to influence the group in any way, this is particularly true of the interviewer who is in a position to influence the evolution of the group. His function is that of understanding and recording - not that of curing or changing.

*Please do not let anyone
see either of these
interviews?*

5. Objectives of the Study.

The objectives of the Committee Women study group are supplied in the following discussion. It aims to describe adequately all of the social, individual, and technical factors in a minority department. Emphasis is placed upon understanding and describing the individual and social changes which occur naturally in the group. To this end technical changes are omitted as much as possible. We do not wish to imply that technical factors are not important nor of major significance. We do believe that those other changes have been more gradual, and that they are more in need of explanation and analysis than such factors as race, place, time of year, and such variables. Emphasis is placed upon describing the situations and tracing the relationships among the elements involved in establishing a social relationship between an organization and

July 10, 1941.

prod. event and its consequences. We are interested in production only because as it can tell us something about the individual's adjustment to his environment. It is as important to know what makes individual effectiveness decrease as what makes it increase.

The question has been raised as to whether we ever intend to make any major changes in the group situation and attempt to measure the effect. This is an open question, but I believe it can only be answered after the study has progressed for some time. In my view, the first and should be the one demanded - that of understanding and describing the situation and the changes which normally develop in it. When this first step is completed there will be time enough to consider changes. It is my belief that there will be sufficient natural changes to keep us occupied. These developments will be typical of those which constantly occur in the plant and it is believed that a knowledge of these is more important than a knowledge of things which normally are not present.

4. Other Problems.

4.1 Base Period.

Ordinarily, in experimental work, the ideal base period is a continuous record of production over a period of months, taken without the operators knowing it in case their production is not mechanically recorded, or without them knowing they have been selected for study, in case it is artificially recorded. In this particular study a short-cut going combination of the factors present in the regular department setting would constitute an ideal base period. Production is a significant factor in the situation which must be recorded. The regular department records over a period of months should be studied first. From a mechanical record should be determined and no other change should take place until the operators are assured that the effects of this change have fully worked themselves out. The length of this necessary run will control how the base for future production records.

Before any change is made, however, the investigator should obtain as complete a picture as possible of the forces which are operative. This analysis, followed by an accurate record of production, should constitute an adequate base period.

July 10, 1951.

4.2 Control group.

A control group might not be needed in the study, but it is believed that the control group would be more than offset by the cost and inconvenience involved.

4.3 Variables to be kept.

- 4.31 Production - in Mass Intervals.
- 4.32 Quality of work - number and distribution of errors per day.
- 4.33 Attendance - absences, lateness, personal time out, etc.
- 4.34 Accidents and injuries.
- 4.35 Health - medical exams, diet, sleep, pulse, weight.
- 4.36 Temperatures and humidity, *no ground*
- 4.37 Interviewer's records.
- 4.38 Supervisor's records.

4.4 Selection of group.

The method of random choice obviates the criticism of selecting first workers. This really makes little difference because it has been made clear that our major interest is not in boosting production.

4.5 Informing group or their selection.

Considerable thought must be given to this problem because it would be easy to give the operators a false impression of the purpose of the study. Probably it would be best to explain the purpose of the study very slowly, tell them they will receive no special privileges, and that they will be treated the same as in the past. It will be the interviewer's function to secure their cooperation in successive interviews. More important than the explanation given will be the impressions they derive from actual experience in the study group. The interviewers must be extremely careful in their day to day contacts not to give them misleading impressions.

4.6 Recording.

This should be done by the regular department in the usual manner.

July 10, 1961.

A
Jewell Smith

4.7 **Method.**

While it is desirable to study the same operations over a period of years we must not forget that they are human beings looking forward to some kind of a career. It would seem advisable, therefore, not to interfere in any way with the promotion or career of any individual. There are advantages as well as potential problems for this school. Teachers and operating are several functions. We should be interested in why and how they are made, the effect upon the individual, and upon the group.

4.8 **Discipline.**

To be handled by supervisor.

4.9 **Individualization.**

Because of the job to be done development there are likely to be fundamental changes in the way it is performed within a year or so. These should be allowed to take the course. Individual or the basic concept of individualization would, in itself, justify this study.

4.10 **Anonymity.**

The information obtained by the Interviewer and Supervisor must be presented by them as confidential. In publishing the material situations must be masked should be used. The operator's supervisor should never be given credit to the interviewee.

E. J. REEDER - 6000-11