RELAY ASSEMBLY TEST ROOM INTERVIEWS

25 pages 1933

April 30, 1935.

Interview with #2

Her address: [redacted] evard, Chicago.

Defective parts.

Springs never spoilt by operators. Often mixed. Often defective on point or disc. Note: some springs have a disc on each side.

Mixed springs were discovered by looking, but points or discs were only inspected by sight to a minor extent. Very few other defects were ever found in springs.

Defects were mainly detected before trial assembly, if at all, some after.

Referring to the low inspection efficiency of springs, J. S. said that this would refer to the inspection of points and discs.

Terminals.

Rarely or never faulty manufacture.

Usually mixed; mainly noticed after assembly. "Occasionally" spoilt by operators by letting the automatic screw driver jump off screw and get entangled in the "little curve" at the end of the terminal.

Screws.

Manufacture good.

Often mixed, mainly noticed after insertion in its hole by height (the only difference between screws); sometimes even noticed before trial if looked at carefully. Not often burned and only stripped when the lower clamp plate was not threaded.

Interview with #2

Clamp plates.

(1) Top. Never spoilt by operators.

Rarely or never mixed (I forget which).

Chiefly wrong manufacture in that holes would be too large or incorrectly placed.

(2) Bottom. Very rarely spoilt by operators.

Very rarely stripped if threaded.

The chief error was failure to machine the threads in the holes; about half of these were noticed before assembly.

Insulators.

Never mixed.

Often of incorrect manufacture in that they were made too wide or too narrow; about half of these were noticed before assembly.

Often chipped by operators letting automatic screw driver slip off screw onto insulator.

Insulators out of alignment. This means that the holes being oversized for assembly, as designed, some care was needed to get the faces flush, and this care was sometimes omitted. The process was to adjust insulators just before running the screws home, or easing the screws with an ordinary screw driver and then retightening with this tool. The use of an ordinary screw driver is called "hand tightening". J. S. said alternatively if the insulator were too wide or narrow it would be out of alignment.

Interview with [redacted]

Asked why there was such a rise of this defect in finished relays in 1931, J. S. said it might be due to a large increase of faulty insulators (i.e. wide or narrow); alternatively re-aligning insulators was such an easy job (where manufacture is good), that it was quicker for the inspectors to ease back the screws and do it themselves than make out a rejection card. Occasionally they got "mad" and sent the whole lot back to the assemblers.

N.B. These alternatives can be checked out by seeing whether the number of faulty insulators rose heavily at the same time.

Bushings.

Bushings are rarely delivered broken but often too long in length.

Occasionally mixed.

Sometimes broken in assembly if put in crookedly so that top insulator rides over it, or if too long it is crushed between clamp plates.

With regard to all parts J. S. stated that a basket full of the wrong type rarely occurred, but a few wrong type parts were habitually mixed in.

J. S. referred to the "epidemic" character of reasons for rejecting relays.

Asked why it took so long to rectify accidents in assembly J. S. made a movement of her hands expressive of depression and said that one "sat back and went slow". J. S. said that an accident caused one to "concentrate". (She first introduced this word into the conversation.)

Interview with #2

Other major variables.

Asked whether conversation and pauses occurred mainly between assemblies J. S. at first denied this and then, with hesitation, thought that perhaps pauses occurred mainly after last (screw driver) operation and before putting relay down shute.

J. S. did not think that talking delayed production but probably decreased "concentration". Some of J.S's earlier remarks rather implied that too much talking interfered with best work.

J. S. several times emphasized her opinion that [redacted], especially in early days, tended to pause as she worked, while J. S. did not, but she "looked about" as she talked. N.B. Does this account for J. S.'s large rejected relay rate?

In answer to query J. S. stated that they never forgot to put relay down shute immediately after it was finished, it was quite "automatic". Sometimes the shute flap stuck and the "boy" cleared it and so hole was punched late. Also tendency for ordinary hand screw driver to fall down shute and to put repaired relays down shute by accident.

Nothing, other than completed relays, ever intentionally put down shutes. J. S. several times insisted on the keen cooperation of all operatives in experiment.

I suggested that perhaps the conversations rather fell into two levels, one light and not requiring active attention; the other level more serious and productive of pauses, etc. J. S. did not think so, she pointed out that meeting daily and all day there was little to

say and conversation was mostly "razzing". I remarked that reading afterwards in the daily records some of the "razzing" seemed to have an edge to it. J. S. denied this and said: "We were not a sensitive lot" and we took it all in good fun.

N.B. J. S. afterwards spoke of having intimate conversations with many and also [redacted], when she was a neighbor, in a low voice rather suggesting a second level of conversation.

I questioned J. S. about the faulty assembly of good parts; she emphatically stated that care was needed at all times to avoid a wrong sequence of assembly and stated without hesitation that this "concentration" was definitely greater when the relay type had just changed. When asked J. S. stated that the concentration due to a change of relay type did not diminish conversation.

I read out the following question from my notes:

"Is it difficult to pick up your work after an interruption?" J. S. answered without any hesitation: "Oh, yes, you see it breaks your 'rhythm'" — her word; I had carefully refrained from mentioning it.

Asked whether a faulty part, noticed before assembly, broke the rhythm J. S. said not.

J. S. volunteered several remarks bearing on the presence of rhythm.

I asked whether frequent changes of relay type added to the interest of the work. J. S. denied it with heat stating (without prompting) that everyone disliked it because it diminished speed,

the types were often unknown or had not been assembled by that operator for some years, and spoilt the pay check and "pay is important you know".

Asked whether she liked some types better than others; for example R1316 and R1317 J. S. said that they were both good types; at first everyone preferred R1317 but in the end she found that R1316 was as good. I pointed out that R1317 had three more pieces and is unsymetrical, unlike R1316, and both carry the same piece rate. J. S. explained that the coil of R1316 has four wire ends at one end and two at the other. R1316 has only two wires and so the coil is easier to assemble on the armature.

I explained about my theory as to the constancy of gross bodily movement and that variations in output were due to saving time on manipulative action. J. S. felt strongly that this was so -- she was unconscious that any social determination of the rate of the former had occurred but at once pointed out the likelihood of some such result.

J. S. did not think racing much more tiring than ordinary assembly but undoubtedly slightly so. A good day's output was no more tiring than a bad day. J. S. had no idea what constituted the conditions for a good day; sometimes you started "fine" and could not keep it up; other days it was easy. When racing J. S. felt "tense" and took it easy afterwards. I pointed out that actually her speed immediately after racing tended to be abnormally high -- not slow. J. S. was surprised and supposed that this feeling of slowness

resulted from feeling "easy". N.B. I must verify my statement, if true it is important in connection with J. S.'s belief.

Asked whether the racing was prearranged as regards selection of part, etc., J. S. said: "No, that would have spoilt the experiment." She stated that they raced as hard as they could.

J. S. stated that the work pattern when racing was identical with that ordinarily used and could trace no effect of racing on ordinary working habits.

Asked why there were fewer accidents when racing than in ordinary work, J. S. had no explanation. In ordinary work J. S. insisted that she did not press and was not tense, she volunteered the remark that she believed herself to be the only operative in test group who habitually used her back rest. She also stated that some days her back ached.

Referring to the added work of inspection in assembly J. S. said: "If we knew that all parts were O.K. we wouldn't have to watch" and could work faster.

In response to a question J. S. had no idea why production on the whole failed to rise after 1930 — certainly not due to change in industrial conditions which it was thought right through 1931 could never touch the test room "so much money had been spent on it" — even when [redacted] went we felt sure we were staying, she was a substitute.

I stated that after 1930 J. S. and M. V. held A.H.O. better than Nos. 3 and 4 and asked whether J. S. and M. V. were competing. J. S. stated that they <u>never</u> raced each other as this would have spoilt the experiment.

Interview with #2

Asked why production at the very end fell so badly J. S. said that they "lost their ambition", the "air was so tense". The new thin insulators were more hard to assemble and the added piece rate was an inadequate compensation. N.B. Find out when this last occurred.

Asked whether the successive introduction of new girls depressed her speed, J. S. said that all "friendship" had gone "it wasn't the pace part of it."

Incidentally J. S. showed a continual disbelief that she was much influenced in pace by the pace of others. "If just happened" that one went fast or slow.

I pointed out that the whole test group had a tendency to go fast or slow together both as regards weekly A.H.O. and in other time spans. This particularly applied to J. S. and M. V. J. S. looked puzzled and said she had often noticed that and was very puzzled by it and had thought about it a lot; she had no sense of a social influence. J. S. also remarked that 3 and 4 were good pals and also that their output tended to keep together. Five was rather out of the social group which J. S. implied included 1 to 4 inclusive. She said that No. 5 was "less mad", "older", "married", "more sensible" and implied that they all liked No. 5.

Asked why A.H.O. was best spring and autumn J. S. could not account for a winter dip but said that in summer it got too hot and using the automatic screw driver was very heating.

Interview with [#2] [redacted]

Questioned as to the relative emphasis placed on output and quality, J. S. said major emphasis was on output but that quality was very much on their minds; they "were covered with shame" when many relays were rejected. She repeated this twice in similar words.

I remarked that whereas both in old and new group A.H.O. rose, in neither groups did inspection efficiency get better and the skilled group was not much better than the unskilled group. J. S. reaffirmed that A.H.O. was major concern, but still came back to importance of not having a bad quality record. I got the impression that quality stood to quantity in her mind in the same relation as a pass to an order of merit examination.

Asked why inspection efficiency of springs was so poor as compared to other parts, J. S. said that springs were made of white metal and the small discs and points were hard to see. Other parts had larger defects and were mostly dark colored. Springs had to be inspected by sight and touch.

J. S. stated earlier in the interview that they were all upset at changing places as they lost their particular friends, then J. S. became firm friends with [redacted] and was sorry to change back. "It didn't really matter, we were all good friends."

I told J. S. about the 5 and 0 game which started about 1929, rose to end of 1931 and diminished or vanished in 1932.

J. S. was very conscious of this game and had no idea why it started -- rather implied that there was no real reason for it -- but when asked why it stopped early in 1932 she quickly answered: "We didn't care any more." N.B. This shows that the test group did

lose heart well before [redacted] left (See above).

I suggested that it started at about the time that rise in output ceased and therefore at about the time that the work would begin to bore them. J. S. — "Oh, no, the work was not boring, it would have been boring but that we had freedom of speech." She then implied that conversation increased in 1930 onwards. M.V. This really confirms my hypothesis.

I then told J. S. about the pacing game. She was not conscious of it, but stated that "in the early days" 3 and 4 deliberately dropped their relays in the shute together, one often waiting for the other to finish; it had not occurred to them that this might affect the experiment. J. S. stated that she and M. V. deliberately did not drop together as they understood that in such a case the punching machine could only record one of the two. J. S. implied that this became common practice later. J. S. could not suggest any other games. J. S. stated that one instinctively knew who was using the screw driver all over the room (the last operation). She thought by the loudness. Apart from this operation one knew the exact position of one's neighbor's relays from the hand actions but not those of other operatives.

I mentioned that, whereas the old group always burned some screws, after about three months the new group never did this; J. S. quickly said: "How many did they burn at first?" I answered: "Oh, a tremendous number." J. S. said: "That's why they stopped it."

We discussed patterns of work at some length but beyond an insistence on rhythm J. S. had not much to say. She did not think that she had ever attempted to modify the details of her habits of work; they just came. She had noticed that her right hand did most of the manipulative action, the left hand either holding the pile up steady or reaching for parts. J. S. stated that her pattern of work had never varied from beginning to end. I mentioned that the new girls sometimes picked up two screws at once with one hand and sometimes only one. J. S. said: "Yes, I did that too, that is the only difference I ever made." N.B. I don't think J. S. is quite right: e.g., look up [redacted] schematic layout for two dates for J.S.

J. S. stated that new layouts were devised for the outside shop.

I asked J. S. what sort of reception substitutes got. J. S. said it was always friendly but that very temporary substitutes were rather subdued. [redacted] was a "life long" friend of [redacted] and the group had been asked to chose a substitute when [redacted] left so I chose her. [redacted]: "Did any of the others suggest anyone else?" J. S.: (rather bored and not seeing the drift of the remark) "No, I don't think so." J. S.: "A. P. is a friend of mine and I knew that she wanted the money." She is "very likeable", and "very popular". J. S. kept reverting to the pleasure it was to work in the test room and wondered whether the same five could come back if times improved; she said that once or twice she was prevented from going to work by "one of the great blizzards" and "moped all day" in consequence.

J. S.: It wasn't only the conditions but also the "daily trustfulness we had in each other" and the stability of the test situation.

After the interview J. S. asked me to explain just what we were hoping to get out of our research. I told her the general drift and specified two or three major problems. J. S. remarked that the test started to find out a "few things" but was now going much deeper and was more important. Later at dinner she told [redacted] and I that when her mother and father left Italy (small town near Naples) they settled in London for 10 years before coming to U.S.A. and some children were born in London.

We talked about the continued friendship between members of the test group and [redacted] mentioned that the same friendship was continuing between the ex-women interviewers. I remarked that these seemed to illustrate the fact that in industrial situations individuals were starved of friendly social relationships. J. S. became enthusiastic in defense of this statement.

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The chief impressions of J. S. that I got were: an enthusiastic cooperation with anything to do with the test situation, in no way soured by the lay-off. A reliable and clearheaded witness. Not very perceptive of other people's viewpoints; a tendency to assume that their outlook coincides with hers. Completely adjusted, no obsessions, a happy and competent temperament. Very friendly all round. Italics used to indicate that the exact phrase or words are given. Notes taken throughout interview; duration 5—6 p.m.

Interview with [redacted] May 2, 1933.

M. S. was in seat 1 in test room.

Chipman present.

Questioned about the spoiling of good parts in assembly.

M. S. stated that bushings were spoilt in the manner described by J. S. Also that she practically never chipped insulators by hitting automatic screw driver slip off screws.

Asked why the new girls never burted screws after first few months, M. S. stated that at first she was "quite nervous" with the screw driver and so had this operation on her mind. N.B. Compare J.S's remark on this. Asked which parts were hardest to inspect, M. S. indicated the springs because of the contacts. Asked how she inspected contacts she said by looking and when questioned about feel, said: "I don't think we could feel them with our fingers."

M. S. stated that a good day's output was not the result of pressing, it just happens. In answer to a question she stated that talking was not a great factor in output. M. S. explained bad output as the result of "fumbling" and that "all the parts seem to be bad all at once, that will cause a bad day." "The different (types of) relays have a lot to do with it", — some screws are so short that they are hard to handle — "I always had trouble with R132 because of short screws". Also on easy types there is more screw driver work in the day.

Asked which was the worst operation in making a relay; M. S. said it was picking up the screws; trying to pick up two screws in one hand with both heads upwards. The screw driver action not so bad after the first.

Interview with [redacted]

Asked whether she felt any muscular fatigue at end of day; M. S. said her shoulders, arms and neck ached from holding her arms out in front of her all day. The screw driver action did not fatigue her.

Asked whether she got confused with changes of type; M. S. said: "No. You keep your mind on it more." M. S. likes changes of relay type. "You get more interest especially after you have been on a run for a week or so." M. S. does not think that changes of type make much difference to output. Faulty assembly irritated M. S.

M. S. thought that interruptions upset rhythm a trifle — "It makes you forget which part to pick up." She was not so emphatic about this as J. S. and the idea of having a rhythm was not so strongly in M. S.'s mind. General conversation and even someone watching her work was not an interruption but picking up a part and finding it bad, before assembly, does spoil the swing — "It annoys you. It is an interruption too."

If one part runs consistently bad it becomes very annoying. (N.B. J. S. did not find bad part an interruption although Chipman says she got annoyed.)

Asked what operations she concentrated on particularly; M. S. One concentrates on the relay "in general". "One doesn't concentrate on one part too much you know or one gets the parts in the wrong order"; she repeated this two or three times in different words. If one unusual type has a "freak" part (e.g. very small terminal in R1477) then one does concentrate on the part.

Interview with [redacted]

In general M. S. prefers relays that are unsymetrical on the two sides to the symetrical types; she does not find the former more confusing.

We then discussed learning and work habits. M. S. started next to J. S. and, being at the end, had no other neighbor. M. S. states that she paid no attention to J. S. as her skill was far too advanced to help a beginner and J. S. gave no help.

Until all the old girls had left there was no discussion of working methods but plenty after that and interest concentrated on this problem. Experiments were tried and various of the group devised new ways of simplifying the movements. For example, first one spring was picked up at a time, then two, four, and finally eight. The same story applies to insulators. The girls varied in their ability to pick up a number of parts.

I got the impression that picking up a number of parts with one hand and getting all correctly facing one way, etc., was their major preoccupation and was more difficult than assembling them when in the hand.

At first working with both hands was very difficult but that is not so now; a continual evolution of this work pattern has been going on. M. S. is markedly right-handed. M. S. said that [redacted] is very left-handed (No. 3) and she reversed the normal hand procedure in fitting the coils on the armatures although she used the screw driver in her right hand.

M. S. does the most delicate work with her right hand, but G. S. does it with her left and consequently the baskets are not well arranged for her.

Interview with [redacted]

We then discussed the influence of the operators on each other's output.

Without saying so very clearly M. S. implied in her conversation that the similarity in rise and fall of output amongst the group was not in any sense arranged but was a genuine instance of influence.

M. S. stated that in the test room she was always conscious of her neighbor's output ([redacted] and of her progress throughout the day, but that she did not have any sense of how the others were getting on.

M. S. recalled [redacted] as saying that she (G.S.) never knew what her neighbor was doing. When transferred to the conveyor M. S. sometimes was conscious of [redacted] progress, and sometimes of [redacted] progress, and sometimes "I just go by myself" and keep track of nobody. M. S. implied that she did not naturally keep track of both her neighbors simultaneously.

Asked whether Assembly or Inspection was her principal concern M. S. said: "Assembly".

Comparing the test room and conveyor situation M. S. said: "It seemed to be smoother going in the test room" -- than on the conveyor.

M. S. and [redacted] explained to me that development work was going on throughout the conveyor period, and that the conveyor was still subject to adjustment and delays. Consequently the girls were paid by the hour, not on output while on the conveyor.

When questioned further about the poor "going" on the conveyor; M. S. said that one waited for jogs to come down the conveyor and waited

for adjustments, and also for parts. [redacted] subsequently explained that owing to contracting orders the girls sometimes had not enough to do but that major delays did not occur every day.)

M. S. talking of this waiting said: "It sort of takes the pep out of you; you just don't care any more whether you do a good job or not."

[redacted] remarked that [redacted] had made the identical remarks to him previously.

Asked about the desire to do a good day's work M. S. explained that it was not the wages (flat rate on conveyor -- see above) but feeling "that you have done your bit -- the more you do the better you feel". Also competition with moderately faster workers a great incentive. (N.B. [redacted] is slightly faster than M. S.)

M. S. said she did not try to speed at first; "I figured that if I got into handling the parts right the speed would come." She also stated that a good day's work was no more tiring than a bad day, she implied that it was impossible to command a good day nor was it a case of pressing — "everything went right some days".

M. S. said that they still talked when on the conveyor in spite of official discouragement, and also thought that the non-test group were trying to beat them in output and getting unofficial help from the instructor, she was not conscious of much feeling on the part of the test group and did not think that they were consciously racing the other side.

[redacted] told me that the non-test group were placed on the conveyor three days ahead of the test group.

Interview with [redacted] May 2, 1933.

[redacted] present.

[redacted] s an inspector of relays attached for some time to the test group.

Asked how she inspected the various parts and what she looked for. H. K. explained:

A bushing breaks (1) because it is too long; (2) because the end insulator is not properly threaded through it and lies on its end. In either case when the screw is tightened it squeezes the bushing and breaks it. Then splinters and bits from the bushing get between the parts and hold them slightly apart; this is easily noticed and indicates a broken bushing.

Insulators are looked at round their visible edges for cracks or chips and inspected for alignment of edges.

Stripped screws, according to H. K. are always due to faulty tapping of bottom clamp plate.

A relay rejected for "stripped screw" implies that screw is loose in plate and is not intended to indicate which is at fault.

H. K. states that she can inspect 50 relays in 10 minutes and that her "bogey" is 264 per hour; this gives time to write out repair cards.

H. K. says that at first the new girls made a tremendous number of mistakes but improved steadily.

I mentioned the sudden rise in mixed screws in 1932. H. K. said sometimes screws are not mixed for months and then, as in 1932, this gives no end of trouble for quite a time. H. K. is positive that

her standard of inspection has remained constant over her whole inspecting life and that nothing passes her since she has never been spoken to on this score. A final inspection of the relay occurs after the screws are tightened under a press.

It came out later that up to about three years ago the inspectors inspected with any detailed routine they liked but that this resulted in very uneven work, many faults being missed. Then a definite routine or inspecting work pattern was taught to all inspectors. [redacted] produced a box of relays and H. K. went through the performance of inspecting five before me.

Five relays are taken out of the box at once and held in a given way and the routine is quite definite as regards:

(a) What hand movements the inspector makes

(b) The positions each relay takes

(c) What is to be looked for at each relay position.

H. K., while not agreeing that any difference of inspecting standards could arise, did say that if a defect was found to be passing inspection the inspector would look closer for that type of defect. Chipman put this point more forcibly.

Chipman commenting on above interview:

Defects did sometimes pass the inspector and get found out afterwards.

It is not true that a stripped screw always implied a defective bottom clamp plate. He had examined a number of such screws and plates and noticed often that the tapping of the plate was perfect

except for the first thread or two where it had clearly cross threaded on the screw. N.B. See J. S. on this subject.

Interview with [redacted] #8 May 2, 1933.

[redacted] present.

[redacted] is the layout operator (official title "instructor") who has been with the test group from the very beginning to the end of the conveyor work. Nickname "B".

I asked B whether she knew what caused the enormous rise of relays rejected for "insulators out of line" round July and August 1931. She remembered the event perfectly and also the cause; namely bushings too short which permitted the outside insulators to ride over the bushings and take up any position permitted by the screws. All other hypotheses, B indicated, were beside the point, she remembered the whole thing clearly.

B and [redacted] between them then gave me a sketch of the various inspectors connected with the test room. Up to the spring of 1929, or 1930 (they couldn't remember which) the test room relays were inspected in the regular shop. B became convinced that the shop was returning to the test room relays defectively assembled in the shop. After that date the following inspectors were allotted to the test room in the order given below: The exact dates of these inspections has been given by [redacted] in a letter to someone at Harvard; [redacted] or me — also the history notes contain the dates.

(1) Elizabeth

A "somewhat mental case" — no initiative — "Afraid of her job" and her bosses. An over-strict inspector "very close inspector" — does not get on with people. Subject to fits - elderly.

(2) [redacted]

Friendly with test group - lazy.

(3) [redacted]

Very careless as an inspector and was reprimanded for this several times.

(4) [redacted] (came back)

(5) [redacted]

A good average inspector. N.B. See my interview with her.

We then talked about learning.

B. said that beginners had very little difficulty in getting clear about the actual assembly sequence, the arrangment of the boxes assisted them. She agreed with [redacted] that this varied with the individual and that K. learned the actual sequence with great difficulty.

The chief difficulty was to pick up a good work pattern, the new group are still learning this. The pattern varied widely with the individual. J. S. was less ambidextrous than most operatives, and also picked up fewer parts with one hand than the rest of her group; in this J. S. was a striking contrast to [redacted] B did not think that inspection was an important factor in assembly — "you have to look at the tray anyway."

B entirely agreed that speed of assembly was not correlated with gross bodily movement, it depended on "neatness of fingers". Also B thought that gross bodily movement did not vary much from one time to another.

Interview with [#8]

[redacted] backed B in her opinions on the relative importance of G. M. and M. A.

The effect of talking entirely depends on the girl; [redacted] cannot work and talk, [redacted] the same thing.

On the whole there was much less talking when output was good. When the output fell down they "chattered".

Anyone of the group might start the talking, often [redacted] but [redacted] was often responsible for stopping it.

In the original group change of relay type did not depress the talking; this is not so true in the case of the new group.

B type relays are all very similar apart from the coil.

We discussed the 5 and 0 game and the pacing game and I asked for any others.

B and [redacted]: [redacted] sometimes in the morning or at 12:45 (never after rests) came in early and completed a relay up to screw driver action before hooter went and then used screw driver and completed immediately after the hooter. No one else did this (look on tapes). Neither knew of any other games.

As regards the accuracy of B's output records, [redacted] kept independent records and they always checked exactly with B.

We discussed the halt in rise of output in 1930. B and [redacted] both ~~claimed~~ denied that it connected with the general industrial situation.

There was no hint of anxiety in the test room in 1930, this began at the end of 1931. In the regular department lay-offs began at end of 1930 or beginning of 1931.

Talking of the conveyor B said that there were interruptions and the girls "lose their speed, or lose their ambition".

Remarks by [redacted] May 1933.

On the new conveyor the non-test group had their own instructor who, unlike B, only kept output records to the nearest 5 (never more than 2 or 3 out). Consequently the output records suggest the 5 and 0 game — wrongly. [redacted] asked her to keep accurate figures which she then did. Date of this in history sheet.

[redacted] states that [redacted] was easily the dominant figure in the new test group; "a second [redacted]".

[redacted] is very sure that even at the peak of production inspection was never slackened as a whole in quality. On one or two occasions a batch of relays did miss inspection.

[redacted] points out that at some late date each girl of the original group was assigned a few very similar types. Occasionally a girl's range of types ran out and she had to take on a very different type; look for confusion.

[redacted] agrees with [redacted] "rassing" had no edge; or only very rarely.