

Hawthorne Experiments

INTRODUCTION

- The Hawthorne studies were conducted in order to find out the role of human resource in increasing the production of an organization.
- The Hawthorne studies included the following experiments..

Experiments Conducted

- Illumination Experiment
- Relay Assembly Test Experiments
- Relay Assembly Room #2
- Mica Splitting Test Group
- Plant Interview Group
- Bank Wiring Observation Group

HAWTHORNE EXPERIMENT

- Conducted between 1924-1932
- Conducted at WESTERN ELECTRIC COMPANY, Chicago, USA
- Conducted by,
 - ❖ Elton Mayo
 - ❖ White Head
 - ❖ Roethlisberger

George Elton Mayo

- ✓ He was an Australian Psychologist, Sociologist and Organization Theorist.
- ✓ Lectured at University of Queensland before moving to the University of Pennsylvania
- ✓ Spent most of his career at Harvard Business School and was the Professor of Industrial Research
- ✓ Known as the founder of Human Relations Movement
- ✓ Also known for his research including Hawthorne Studies

George Elton Mayo



Fritz Roethlisberger



*He was a Social Scientist and Management Theorist

*He was also the Professor of Harvard Business School

WhiteHead

▪He was the Industrial Worker

Western Electric Company

- Gray and Barton, a telephone industry supply company founded in 1869 by Elisha Gray and Enos Barton
- In 1872, the company changed its name to the Western Electric Manufacturing Company
- In 1881, when the annual sales had already grown to nearly \$1 million, the firm was purchased by the American Bell Telephone Company, it was renamed the Western Electric Company and became Bells manufacturing arm

Airplane View of Hawthorne Works.



Magnetic Wire Insulating Department



Western Electric Company



Research on productivity at massive manufacturing complexes like the Hawthorne Works was made possible through partnerships among industries, universities, and government. In the 1920s, with support from the National Research Council, the Rockefeller Foundation, and eventually Harvard Business School, Western Electric undertook a series of behavioral experiments. The first, a sequence of illumination tests from 1924 to 1927, set out to determine the effects of lighting on worker efficiency in three separate manufacturing departments. Accounts of the study revealed no significant correlation between productivity and light levels. The results prompted researchers to investigate other factors affecting worker output.

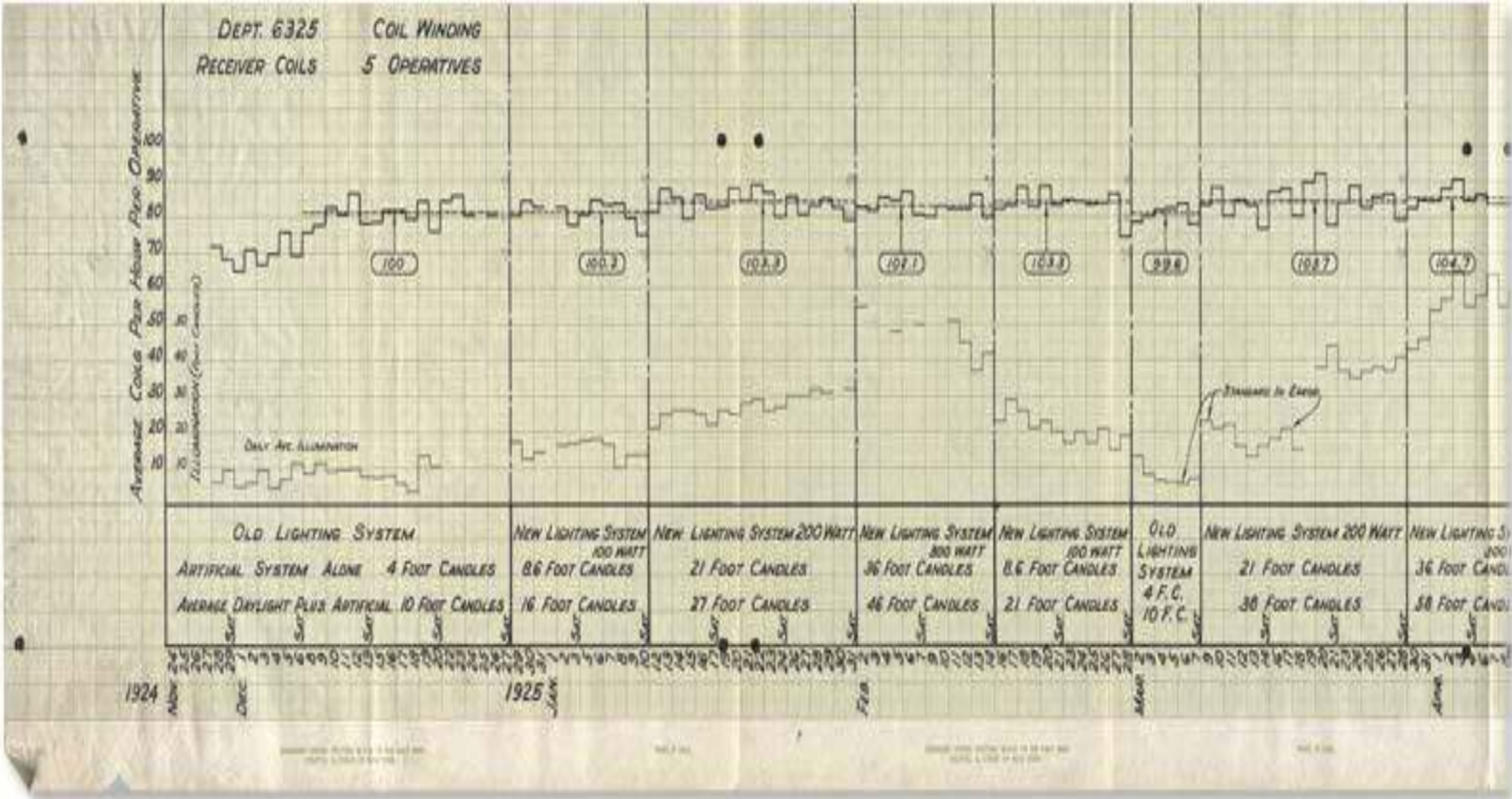
Hawthorne Experiment

- The Hawthorne experiments were first conducted in November, 1924 at Western Electric Company's Hawthorne plant in Chicago
- The initial tests were sponsored by The National Research Council (NRC) of the National Academy of Sciences
- In 1927, a research team from Harvard Business School was invited to join the studies after the illumination test drew unanticipated results
- A team of researchers led by George Elton Mayo from the Harvard Business School carried out the studies (General Electric originally contributed funding, but they withdrew after the first trial was completed)

Illumination Studies

- 1924-1927
- Funded by General Electric
- Conducted by The National Research Council (NRC) of the National Academy of Sciences with engineers from MIT
- Measured Light Intensity vs. Worker Output
- Result :
 - Higher worker productivity and satisfaction at all light levels
 - Worker productivity was stopped with the light levels reached moonlight intensity.
- Conclusions:
 - Light intensity has no conclusive effect on output
 - Productivity has a psychological component
- Concept of “Hawthorne Effect” was created

IILLUMINATION STUDY

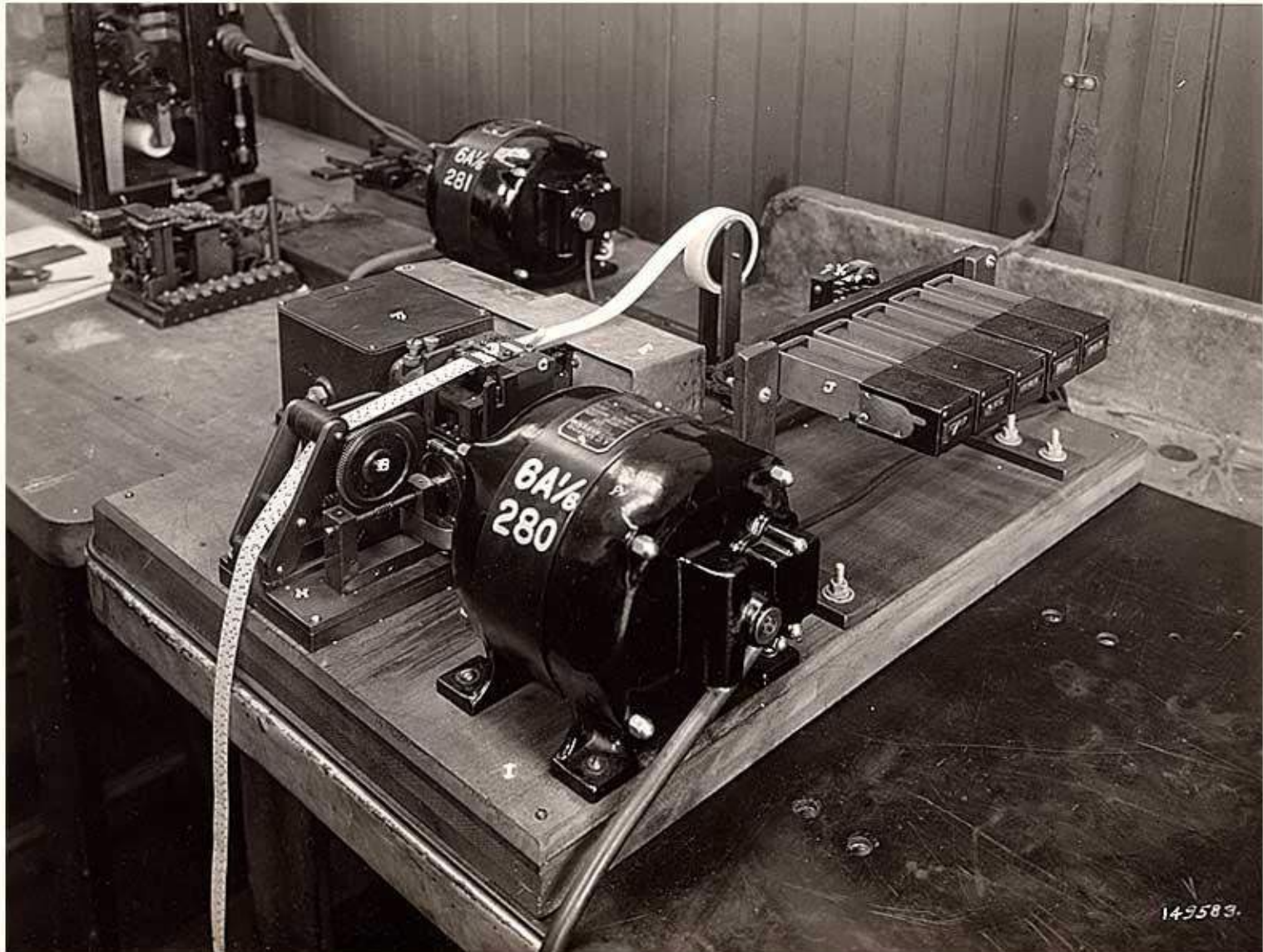


The next experiments beginning in 1927 focused on the relay assembly department, where the electromagnetic switches that made telephone connections possible were produced. The manufacture of relays required the repetitive assembly of pins, springs, insulators, coils, and screws. Western Electric produced over 7 million relays annually. As the speed of individual workers determined overall production levels, the effects of factors like rest periods and work hours in this department were of particular interest to the company.

Relay Assembly Test Experiments

- 1927-1929
- Experiments were conducted by Elton Mayo
- Manipulated factors of production to measure effect on output:
 - Pay Incentives (Each Girls pay was based on the other 5 in the group)
 - Length of Work Day & Work Week (5pm, 4:30 pm, 4pm)
 - Use of Rest Periods (Two 5 minutes break)
 - Company Sponsored Meals (Morning Coffee & soup along with sandwich)
- Results:
 - Higher output and greater employee satisfaction
- Conclusions:
 - Positive effects even with negative influences – workers' output will increase as a response to attention
 - Strong social bonds were created within the test group. Workers are influenced by need for recognition, security and sense of belonging

PERFORMANCE RECORDING DEVICE





Relay Assembly Room #2

- 1928-1929
- Measured effect on output with compensation rates
 - Special observation room
 - 1st Session- Relay Assemblers changed from departmental incentive to small group incentive
 - 2nd Session - Adjusted back to large group incentive
- Results:
 - ‘Small group incentives’ resulted in highest sustained level of production – Output dropped in 2nd session
- Conclusion:
 - Pay relevant to output but not the only factor

WOMEN IN THE RELAY TEST ASSEMBLY ROOM



Theresa Layman Zajac's Paycheck, August 13, 1927

CLOCK NO. AND DEPT.		NAME		RATE	WEEK ENDING	M. D. 213-Q (12-26)	
WE.1 21 6329		E301108 6-01-25 THERESA L.LAYMAN		33	AUG. 13 1927	DETAILS OF PAY CHECK (HOURLY) TO BE RETAINED BY EMPLOYEE AFTER RECEIVING CHECK.	
HOURS	EARNINGS & OTHER CREDITS			DEDUCTIONS		AMOUNT TO BE PAID IN CASH	
	DESC	AMOUNT	TOTAL	DESC	AMOUNT		
48 ¹ / ₂	D	15 96	29 90*T			28 40*	
	I	78					
	PB	9 98					
	B	3 18		1 50			

THIS IS A STATEMENT OF YOUR PAY ROLL ACCOUNT FOR WEEK ENDING DATE SHOWN ABOVE AND IS ALSO A RECEIPT FOR ALL DEDUCTIONS, EXCEPT THOSE FOR CASH SALES WHICH WILL BE RETURNED TO YOU ATTACHED TO PAY CHECK.

TO BE FILLED IN BY FOREMAN'S CLERK

ABSENT SICK JURY DUTY
 LEAVE OF ABSENCE LEFT CO. _____
 VACATION _____ SEE INSTR. _____
 TRANS. TO DEPT. _____ 10.11
 OVER FOR KEY TO LETTER SYMBOLS

Mica Splitting Test Group

- 1928-1931
- Measured output with changes to work conditions only:
 - Special Observation Room
 - Length of Work Day
 - Use of Rest Periods
 - Workers stayed on established Piece-rate compensation
- Result:
 - Productivity increased by 15% over standard output base
- Conclusions:
 - Productivity is affected by non-pay considerations
 - Social dynamics are a basis of worker performance

Mass Interview Program

- **Conducted 20,000 interviews.**
- **Objective was to explore information, which could be used to improve supervisory training.**
- **Initially used the method of Direct Questioning and changed to Non Directive.**
- **Results**
 - **Giving an opportunity to talk and express grievances would increase the morale.**
 - **Complaints were symptoms of deep-rooted disturbances.**
 - **Workers are governed by experience obtained from both inside and outside the company.**



Mass Interview Program (Contd)

- The workers were satisfied or dissatisfied depending upon how they regarded their social status in the company.
- Social groups created big impact on work.
- Production was restricted by workers regardless all financial incentives offered as group pressure are on individual workers.

Bank Wiring Observation Group

- 1931-1932
- Limited changes to work conditions
 - Segregated work area
 - No Management Visits
 - Supervision would remain the same
 - Observer would record data only – no interaction with workers
- Small group pay incentive
- Result:
 - No appreciable changes in output
- Conclusions:
 - Preexisting performance norms
 - Group dictated production standards –
 - Work Group protection from management changes.

CONCLUSION

- The Hawthorne studies have had a remarkable impact on management in organizations and how workers react to various situations.
- The research carried out at the Western Electrics Hawthorne plant during the 1920's and early 1930's helped to initiate a whole new approach to human behaviour studies.
- The final result was “the organization of teamwork-that is, of sustained cooperation leads to success”.