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W. A. SHEWHART'S COLLECTION

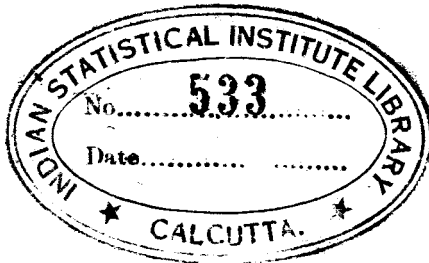
Commentary on

S. S. Wilks'

FUTURE DEVELOPMENT IN RESEARCH AND TRAINING
FOR INDUSTRIAL STATISTICS

by

W. A. Shewhart



Robert Treat Hotel, December 13, 1946,
Conference Dinner Meeting based upon
the General Topic, A Blueprint of the
Future for Quality Control.

A BLUEPRINT OF THE FUTURE FOR QUALITY CONTROL

With Commentary by DR. WALTER A. SHEWHART, Bell Telephone Laboratories

Presiding: EDWARD F. WESTON, President of Board of Trustees, Newark College of Engineering; Chairman of the Board, Weston Electrical Instrument Corporation



Friday, December 13, 1946, at 6:30 P. M.

ROBERT TREAT HOTEL

GEORGIAN ROOM

NEWARK, N. J.



**Make Dinner Reservations by Dec. 10th. \$3.50 per Person For Reservations Write To:
PROF. C. O. ROTH, JR., Newark College of Engineering, 367 High Street, Newark 2, N. J.
Include Remittance Payable to Newark College of Engineering**

Dr. Samuel S. Wilks is an internationally recognized authority in the field of Mathematical Statistics. Is a man of broad experience in the application of statistics in many fields of Scientific Research. A member of the Applied Mathematics Panel of the N.D.R.C. and the Naval Operations Research Group. During World War II, he directed the application of Mathematical Statistics to many kinds of scientific and engineering problems. As a member of the Committee of Applied Mathematical Statistics of the National Research Council, he took an active part in helping governmental agencies in their organization and training for Quality Control.

For many years Dr. Wilks has served the interests of Quality Control as an active member of the Joint Committee for Development of Statistical Application in Engineering and Manufacturing, as organized in 1929 and sponsored by several Engineering and Scientific Societies. He is a member of the Committee on Quality Control of Materials, recently organized by the American Society for Testing Materials. Is co-chairman of the Committee on Measurement of Public Opinion, Attitudes, and Consumers Wants, sponsored by the National Research Council and the Social Scientific Research Council. He is well qualified to paint a comprehensive picture of the future contributions Statistics can make to Industry and to indicate the kind of training that the Industrial Statistician of tomorrow should possess.

— SPECIAL NOTICE —

Saturday, Dec. 14, 1946, Starting 9:30 A.M., Engineering Building, Princeton University, Princeton, N. J.

ALL DAY CONFERENCE — MIDDLE ATLANTIC REGIONAL MEETING

of the American Society for Quality Control; Sponsored by Delaware, Philadelphia, and Metropolitan New York Sections
Jan. 24, 1947, Newark, N. J., Essex House: Annual Business Meeting — Contributed Papers

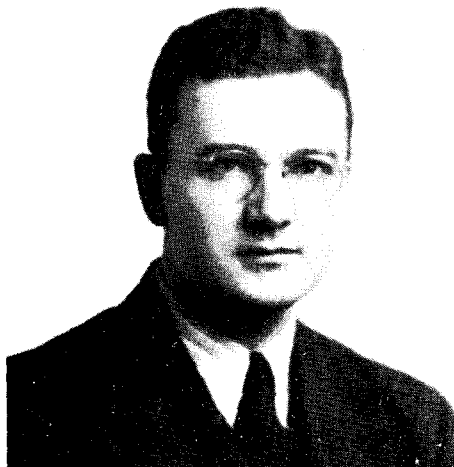


THE SOCIETY FOR STATISTICAL QUALITY CONTROL

Metropolitan New York Section of AMERICAN SOCIETY FOR QUALITY CONTROL

— AND —

THE NEWARK COLLEGE OF ENGINEERING SPECIAL COURSES DIVISION CONFERENCE ON ACCEPTANCE SAMPLING



PRESENTS

DR. S. S. WILKS

Professor of Mathematical Statistics

PRINCETON UNIVERSITY

— as —

GUEST SPEAKER

*E. C. ...
to ...*

I

*Born
6/17/06*

About 1932

Boy from Texas on his way to London to study statistics under Karl Pearson and others.

The picture on the announcement of this meeting is about the way that boy looked in 1932.

Outstanding paper on quality control

Important background for everyone interested in the future of quality control:

- Universities
- Industries
- Men

WORDS OF WISDOM from a man who knows from experience

14-18 hours, 7 days a week

Too modest even to suggest that he personally was in the thick of all the applications in the war.

Most of you from industry agree in general and are interested in what he said

Many of you are looking for suggestions about what you can do

As Engineers we want a BLUEPRINT.

"When he (Columbus) started out he didn't know where he was going; when he got there he didn't know where he was; and when he got back he didn't know where he had been".

1. Some of us as quality control engineers started out but we didn't know where we were going.
2. Perhaps some of us here tonight do not know what we should do to advance quality control.
3. It would be unfortunate if we got back to our desks after this meeting without a clear picture of at least some of the things that we can and should do in developing the future of quality control.
4. Asked four quality control engineers to read Wilks' paper and to tell me what plan of action it suggested. What does Wilks's paper contribute to the Blueprint for Quality Control? All said that it did not suggest such a blueprint.

In a minute I shall give you what I consider to be six important factors in such a blueprint that are brought out in Wilks' remarks. Further study of this paper may reveal more.

III

MINIATURE STATISTICAL STUDY

S. S. Wilks' address

First, however, a miniature statistical study of Wilks' address.

1. 140 sentences. (Wilks only)

2. Distribution of lengths.

3.

	<u>Min.</u>	<u>Max.</u>	<u>Average</u>
SSW	8	69	30
WAS	6	79	32.5
Dickens	4	63	11.5

Statisticians tell us that only 4-1/2% of adult population can read articles in which the average sentence length is 24 words or more.

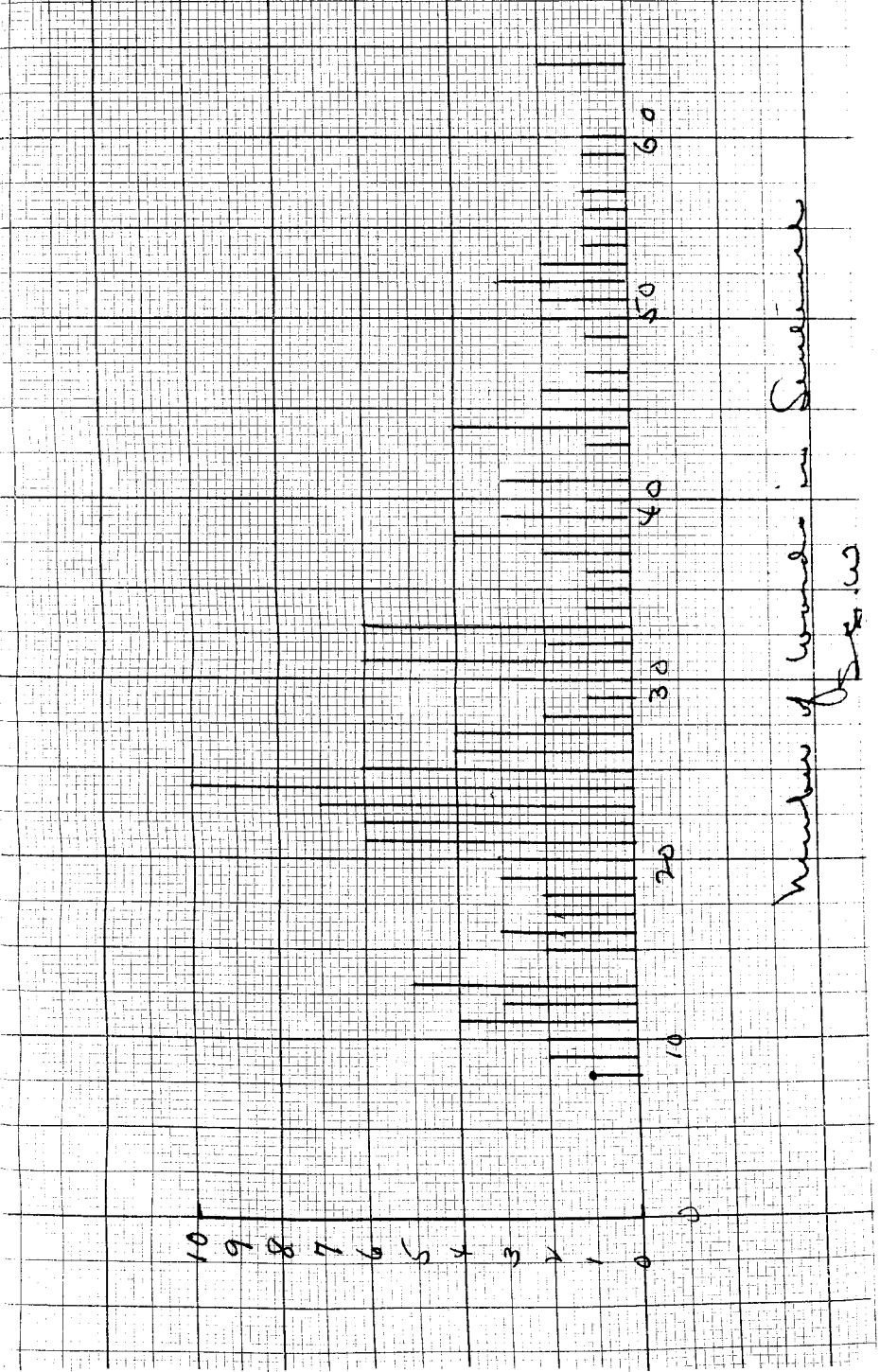
KNOWING THAT WE ARE QUALITY ENGINEERS, WILKS HAS PAID US A HIGH COMPLIMENT BY PUTTING US ALL IN THE 4-1/2% GROUP.

10
9
8
7
6
5
4
3
2
1
0

0 10 20 30 40 50 60

Number of words in Sentences

10/10/20



IV

SIX ITEMS IN BLUEPRINT FOR FUTURE

1. "Statistical training is to be built into the training of all engineers similar to the way in which calculus and differential equations are now made a part of their training."

Wilks stresses what academic institutions need to do. He makes it clear, however, that colleges, universities, and engineering schools have been caught napping and are not even now set up to do this job.

What is industry going to do in the interim?

Must we sit and wait?

What can you and I do and the thousands of others like us?

One answer is:

Within company training in mathematical statistics:

Reading groups and the like similar to those being carried on in many industries in

Quantum mechanics
Statistical mechanics
Short wave transmission
Etc.

} Colloquium lectures

2. Have industrial conferences on quality control like this one

- a. more to quality control and industrial statistics than simply mathematical statistics.
- b. Some practical problems involve new developments in mathematical statistics.
- c. Noone in academic life sufficiently clear about the practical aspects of quality control.

INDUSTRY \rightleftarrows UNIVERSITY

3. "Quality control includes both physical and human elements in research, development, specification, manufacturing, inspection, sales, advertising, consumer reaction, and the like".

To me this is Wilks' picture of where we are going in quality control. Much like the following definition of management:

"Management is the art and science of preparing, organizing, and directing human effort applied to control the forces and to utilize the materials of nature for the benefit of man."

4. Operational Research groups should be formed in industry

Great contribution in war after idea had been sold.

Greatest contribution to subsurface warfare.

Requires mathematics and statistics.

Natural Scientists

Mathematician
Physicist
Chemist
Biologist

Social Scientists

Physiologist
Psychologist
Etc.

Difficulty of forming such groups in war and in industry.

Example 1 Permalloy

Specification
Routine chemical analyst
Research chemical analyst
Production
Metallurgist
Mathematical statistician
Etc.

Example 2 Consumer reaction.

Psychologist
Physiologist
Physicist
Statistician
Etc.

5. Operational groups must be attached to the "command" - in industry, that means management

Such groups should be formed in major segments

6. To advance the operational approach there should be conferences and seminars in which industry and academic institutions cooperate. These should be initiated by universities and scientific organizations

NRC
NRC-SSRC
ASTM ASA

Consumer standards

Engineer	Chemist
Psychologist	Production man
Philosopher	Physiologist
Statistician	Economist
Physicist	Marketing man

