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Statistical Quality Control in India

and

Its Future in the United States

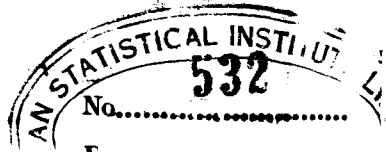
by

Walter A. Shewhart

Paper to be given before Metropolitan  
New York Section of American Society for  
Quality Control, 2 Park Avenue, New York  
City, 6:30 P.M., October 5, 1948

*Article by Walter A. Shewhart  
given at New York Section of American Society for  
Quality Control, 2 Park Avenue, New York  
City, October 5, 1948.*

W. A. SHEWHART'S COLLECTION



## FUTURE PROBLEMS

### Future in United States

Inspection, production, design, development, research in natural science, research in social sciences, consumer standards, economics. (pilot plant)

### Future in India

Research in natural science most emphasized, then development, design, production, inspection. Will have to emphasize inspection step if goods are to be acceptable for international trade.

### Mutual problem: Quality Control in International Trade

International Standards Organization  
United Nations

## INTRODUCTION

Telegram - "Metropolitan New York Section wish you a pleasant, restful, and controlled voyage. Best wishes to India."

Your greetings to those interested in quality control in India were transmitted to them and deeply appreciated. My talk tonight is in the nature of a

### Report on

Why I went.

What I did.

What was accomplished.

## INVITATION

### 1. Indian Statistical Institute

- 1.1 Staff of upwards of 275.
- 1.2 Noted for contributions to
  - a. Mathematical statistics
  - b. Sampling surveys and design of experiment.
- 1.3 Sankhya - one of three best journals in mathematical statistics.
- 1.4 Prof. S.N. Bose of the Einstein-Bose statistics team was acting director of the IMS and made all preliminary arrangements in India for my visit.

### 2. Indian Standards Institution

- 2.1 Organized in 1947 along lines of ASA and BSI.
- 2.2 Dr. Mookerjee, Minister of Supply, president.
- 2.3 Dr. Lal Verma - Ph.D. in physics from Cornell, director. Recently travelled through U.S. (picture)

### 3. Indian Science Congress

- 3.1 Each year invites foreign scientists - expenses paid out of a government grant for this purpose.
- 3.2 Last year (1946) about five from England and five from USA were invited and included Sir Charles Darwin from England and Harlow Shapley from U.S. I was invited then to go over but felt that the industrial situation was too chaotic. This year: Prof. Alexander Findlay from England, W.A.S. from US.

## FUNDAMENTAL OBJECTIVE

### India's need for industrialization

English policy prior to August 15, 1947.

Almost no Indian factories

Only English as managers and directors  
(Tata's a glowing exception)

No steel fit for airplanes.

Shortage of men with the know-how  
of production

Labor troubles

No carbon for microphones

No paper for condensers

No plastic

Airplane development short of 14  
different materials; hence must  
depend upon imports

Situation in the production of  
ordnance

Financiers lack of interest in  
quality

Criticism of Indian products in  
international trade.

The objective of my visit was to cooperate with the Indian Standards Institution and the Indian Statistical Institute, the Council for Scientific and Industrial Research, and other scientific and engineering groups in an effort to help increase production of goods of standard quality through the application of statistics in research, development, design, specification, production, and inspection.

## SETTING THE STAGE

### Conference on Industrial Development in India

Held in New Delhi, December 15-18, 1947, under the auspices of the Government of India Ministry of Industry and Supply.

1. To increase production,
2. To increase transportation,
3. To decrease labor troubles.

Dr. Mookerjee, Minister of Supply, was chairman of the conference and in introducing me said, among other things: "It is obvious that the sound development of our own export trade will also depend very largely on how far we succeed in our efforts to improve the quality of our exported goods. How this objective can be attained without any undue increase of the cost of production is a question which we have requested Dr. Shewhart to deal with in consultation with the members of the Indian Standards Institution."  
(Audience, J.R.Tata, Sir Shri Ram, Englishman)

### SOME NECESSARY BACKGROUND

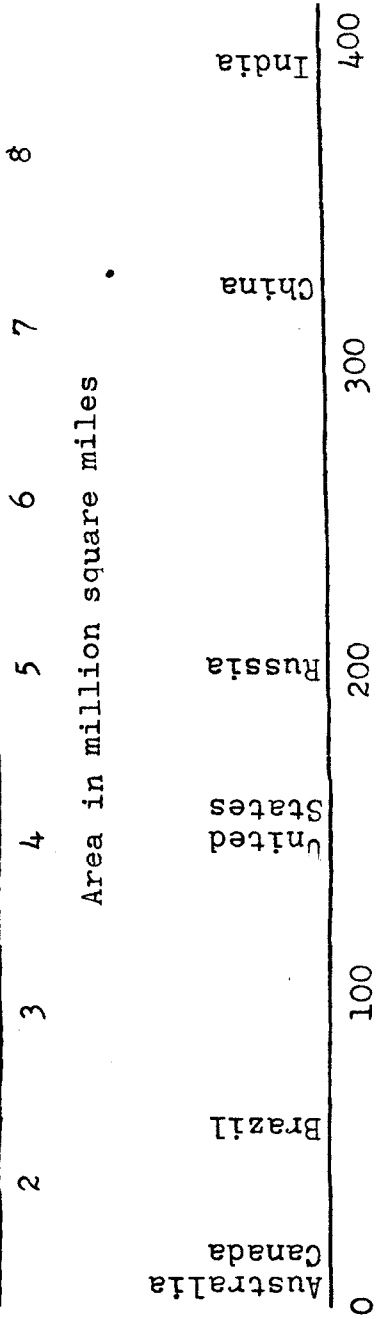
Population - 1-1/2 million square miles;  
nearly 400 million population.  
Increasing at rate of 4 million  
a year.

Russia: 8-1/2 million square miles;  
200 million population.

Area: India, Australia, Brazil, U.S.,  
Canada, China, Russia.

Population: Australia, Canada, Brazil,  
U.S., Russia, China, India.

6 million refugees



# Religion

## Hinduism

Rig Veda and other Vedic influences  
No one leader like Christ, Mohammed,  
or Zoroaster.

Gods: Shiva, Vishnu, Brahma.

Caste

Transmigration

Sacredness of rivers

Burn dead and throw ashes in river

Hinduism is the most confused, confusing  
and distinctive of all religions: it is a  
socio-religious order.

Parsis - followers of Zoroaster; hence  
will not pollute air or earth - hence  
feed dead to vultures - sanitary  
difficulties. (Tata family)

Jains - offshoot of Hindus with leader -  
will not destroy any life, including  
mosquitos.

Moslems - Have a leader, Mohammed - bury  
dead and build monuments. Shall show  
some. Succession of conquerors.

Buddhists

Sikhs - leader

Christians



## Food

No food or drug laws.

a 6% shortage in food would cause a severe famine.

No carbon being returned to the soil.

Cows eat garbage.

No fertilizers.

Scientific agriculture well under way.

To support the growing population they must have exports of manufactured goods in order to buy food; so industrialization is a very serious matter.

## Education

1. 10% literate.

2. Hundreds of dialects.

3. No public school system.

4. Universities.

5. Books and magazines - Statesman 30,000  
Probably 5 million readers.

## History

Industrial civilization

Other early "

Asoka (273-232) B.C.

Mogul rulers - Taj

Congress party

More walled cities than any other country.

## Communication

Telephone

Radio

Telegraph

Rail

Air

About four hundred  
million to be

fed  
housed  
clothed  
educated  
transported

Taj Mahal - Akbar (1556-1605)  
Jahangir (1605-1627)  
Shah Jahan (1627-1658)  
Aurangzeb (1658-1707)  
buried at Daulatabad

← Five million people in  
Government  
Industry mgmt.  
Tech. & Sci. groups  
Academic insts.

WHAT WAS DONE

Conference  
on  
Standardization  
and  
Quality Control

Under the Leadership  
of  
DR. W. A. SHEWHART  
of  
Bell Telephone Laboratories  
New York, U. S. A.

Organized by the  
Indian Statistical Institute  
and  
Indian Standards Institution

at  
The Indian Statistical Institute,  
Presidency College, Calcutta.

*Eighth to Fourteenth February, 1948.*

## OBJECT OF THE CONFERENCE

India, like many other countries, today, is faced with the need of maximizing the production of goods without lowering standards of quality. To attain this end, it is essential that we make use of the latest developments in the art and science of controlling both the human and physical factors involved in producing goods to satisfy human wants. Certain western countries, particularly the United States, have found that the application of statistical methods in mass production makes possible the most efficient use of raw materials and manufacturing processes, reduces the cost of production, and makes it possible to turn out the greatest quantity of goods of standard quality. Standardizing bodies, several government departments, and many industries in the U. S. are employing the techniques to great advantage.

Dr. W. A. Shewhart of the Bell Telephone Laboratories, the founder of the "Statistical Quality Control" technique and movement which has become an integral part of industrial standards work is now in this country at the invitation of the Indian Statistical Institute, Indian Standards Institution and the Indian Science Congress Association. He has visited several industrial countries and given several public lectures indicating the advantages that have been attained by industrial groups in America and elsewhere through the application of the principles and techniques of statistical quality control. If India is to make full use of such technique in the immediate future, it is essential that a group of young technically trained men representing some of our major industries be given the opportunity of finding out not only what has been done elsewhere but also of finding out enough about the methods themselves so that they can more adequately

## WHAT WAS DONE

In addition to Dr. Walter A. Shewhart, the following are expected to give lectures during the course of this Conference :

PROF. P. C. MAHALANOBIS,  
*Indian Statistical Institute.*

DR. LAL C. VERMAN,  
*Director, Indian Standards Institution.*

DR. A. V. SUKHATME,  
*Statistician, Tata Iron & Steel Works.*

MR. G. D. MATHUR,  
*Office of the Economic Adviser, Government of India  
(formerly of Calico Group of Mills, Ahmedabad)*

MRS. CHAMELI BOSE

MR. N. T. MATHEW

MR. TARAPADA CHOUDHURY

MR. PROSAD K. BANERJEE

} *Indian Statistical  
Institute.*

## GENERAL

In forwarding applications for admission to the Conference, industrial firms, government agencies, academic institutions and other organizations may bear in mind that in order to take full advantage of the opportunities afforded at the Conference, it will be desirable to select either statisticians familiar with technical aspects of the industry or technical men in industry with at least the knowledge of differential and integral calculus. While every effort will be made to accommodate all those who are so nominated, in case of heavy demand, a selection may have to be made of more qualified applicants for admission. A nominal fee of Rs. 20/- per head will be charged to cover incidental expenses of the Conference.

## APPLICATION FOR ADMISSION

Enclosed application blank may be used for convenience or copied out, if additional copies are desired. Applications, together with the fees, must reach either

THE INDIAN STANDARDS INSTITUTION,  
P Block, Raisina Road, New Delhi

before 25th January, 1948,

or

THE INDIAN STATISTICAL INSTITUTE,  
Presidency College, Calcutta,

before 31st January, 1948.

Those attending the Conference will have to make their own arrangements for accommodation, transport, etc.

## WHAT WAS DONE

1. Travelled 10,000 miles.

Bombay, New Delhi, Calcutta, Patna (via Benares), Jamshedpur, Hyderabad, Bangalore, Mysore, Trivandrum, Cape Comorin.

2. 2-1/2 days in five committee meetings.

Indian Standards Institution  
General Council  
Quality Control Committee  
Indian Statistical Institute  
Quality Control Society.

3. One week conference on standardization and quality control at Presidency College.

4. 30 public lectures

Ministry of Supply conference  
Indian Science Congress  
Institute of Statistics  
Institute of Metals  
Institution of Engineers  
Engineering Association  
Indian Council of Agricultural Research  
Indian Textile Association  
Telecommunications Engineers Association  
Bombay Mill Owners Association  
All India Mfrs. Assn.  
School of Economics  
Universities  
Rotary Clubs

5. Fourteen large conferences.

Indian Standards Institution  
All India Mfrs. Organization  
Hirachand companies - directors  
Kamani Metal Works - officers  
National Radio Company - officers  
Khatau Mills - officers  
Indian Chemical Mfrs. Assoc.  
Indian Statistical Institute  
Industrialists and govt. off., Bangalore  
Industrialists, Trivandrum

6. 28 official dinners.

Nehru  
Governor General, Patna  
Vice-Chancellor of Patna University  
Sir J. J. Ghandy luncheon  
Dr. Verman's luncheon  
American Alumni dinner  
Sir Bhatnagar's tea  
Mr. Joshi's tea, Hyderabad  
Board of Directors, Tata, luncheon  
Taj Mahal dinner - industrialists  
Tea at Khatau mills  
Luncheon, Bengal Chemical & Phar.  
" Pres., Joy Enging. Works  
" Birla group  
" Dr. Mookerjee, Sch. of Med.  
Breakfast on Ganges with paper executives.



## Factories visited

3 textile mills  
2 chemical and pharmaceutical  
Chemical and fertilizer  
jute mill  
paper mill  
radio manufacturing  
2 telephone mfg. and repair  
Electric fan  
tobacco  
glass  
porcelain  
bicycle  
sandal oil  
salt field  
pressed metal, sheet metal  
2 electrical products  
tool  
aircraft  
silk mill  
steel mill  
locomotive  
handicraft

Also talked with managers or owners of  
3 sugar mills, a mica factory, a ship-  
building, munitions, electric battery,  
and several chemical factories, and  
with mintmaster.

Laboratory, Inst. of Statistics, Calcutta  
Chemical Dept., Bombay University  
Inst. of Psychological Research, Patna  
Engineering Research Laboratory, Hyderabad  
Museum - Osmania University  
Textile Technical Institute  
Forest Research Laboratory                      Silk Farm  
Mental hospital  
Chemical Laboratories - CSIR  
Shri Chamarajendra Tech. Inst., Mysore  
Tapioca research farm                      Occupational Inst.  
Indian Institute of Science

What was accomplished

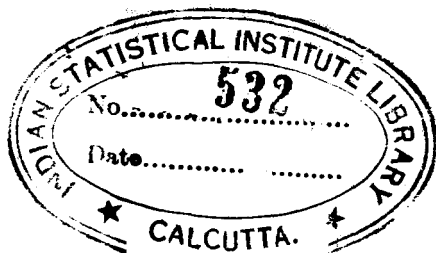
1. Quality control committee of Indian Standards Institution

Textile Committee of ISI

2. Quality control society.
3. Committee for Scientific Research and Development.
4. Quality control in Indian Statistical Institute.
5. Industrial Finance Corporation and Quality Control - The Reserve Bank of India suggests "that when the technical advisory committees are set they should be asked by the Industrial Finance Corporation to regard the existence of scientific quality control systems as one of the important criteria for judging applications".

PCM and Verman came to America to study situation here.

*Courses are being given since 1947.*





AMERICAN SOCIETY FOR QUALITY CONTROL  
METROPOLITAN NEW YORK SECTION

- ANNOUNCES -

As its first gathering of the 48-49 season  
a dinner meeting you cannot afford to miss.

**TOPIC:** Statistical Quality Control in India and Its Future in the United States

**SPEAKER:** Walter A. Shewhart, Ph.D.

*Lecturer and writer on quality control for past quarter century,  
Member - Technical Staff, Bell Telephone Laboratories,  
Past President of American Statistical Association, and  
Honorary Fellow of the American Society for Quality Control*

**SPEAKER WILL BE INTRODUCED BY:** Dr. Hugh Smallwood, Director  
of Research and Technical Development - U. S. Rubber Company

**SPECIAL FEATURE:** Dr. Shewhart will present colored slides prepared during his lecture tour in India.

**Time:** 6:30 P.M.  
Tuesday  
October 5th, 1948

**Place:** Builders Club, 26th Floor  
2 Park Avenue  
New York City

**ADMISSION BY RESERVATION**

Fee (Including Dinner and Gratuities)

**Members \$3.25      Non-Members \$4.25**

Forward admission fees to Mr. Charles J. Tantillo,  
706 60th Street, Brooklyn, N.Y., by September 24th. Make  
checks or money orders payable to METROPOLITAN NEW YORK  
SECTION, AMERICAN SOCIETY FOR QUALITY CONTROL.

- FUTURE MEETINGS -

October 28th, Essex House, Newark, New Jersey  
**Topic:** What Quality Control Can Do For You

November 19th, Engineering Societies Bldg., NYC  
**Topic:** Where Quality Control Fits Into Management

\* \* N E W S - M E M O \* \*

TO: All Members  
FROM: Secretary-Treasurer

September 8, 1948

SHEWART DINNER MEETING

The announcement on the reverse side heralds the opening of our 48-49 season. Dr. Shewart is going to relate his observations of statistical quality control in India based on his trip there early this year. He will also give us his views of the current and future quality control situation here in the United States. Please follow the instructions at the bottom of the reverse side in making reservations. If any of your acquaintances wish to attend, advise them to submit their reservations to Mr. Tantillo.

DUES REMINDER

Statements for 48-49 dues were sent to all members during July. If you have not received yours, please let me know without delay. Incidentally, about half of the membership is not yet paid up. It is urgent that this delinquency be eliminated if we are to meet our financial obligations. We have very little carry-over of funds from one year to the next and each year's expenditures come out of that same year's income.

EXECUTIVE MEETING

Your officers and committee chairman are to meet on September 17th to discuss, among other things, the budget for this year and the educational clinics to inaugurate. The budget will be published and circulated to all members as soon as possible.

QC MEN MAKE GOOD REPORTERS?

We would like to make these NEWS-MEMOES as interesting as possible. Success in that objective, however, depends on active participation of all members. If members don't contribute news items, we can't print them. With the enrollment of our Section so widely scattered, it is difficult for each of us to know his fellow-members as well as he should. We can partly overcome this handicap through personal notes in these NEWS-MEMOES. So ---- drop me a line if you have anything to report such as a change of job, promotion, new application of quality control, articles you are publishing, etc.

MEMBERSHIP DRIVE

As you know, our Section is conducting a membership drive. Each member should be on the alert for potential enrollees. If any of your acquaintances wish to apply, send their names and addresses to the Chairman of our Membership Committee:

Mr. John J. Gordon  
c/o Western Electric Co., Inc.  
100 Central Avenue  
Kearny, New Jersey

Mitchell 2-7700

Ext. 3931

SPEAKERS' TABLE

W.A. Shewhart, BellTel Labs  
H.M. Smallwood, U.S. Rubber  
J.F. Andrews, General Cable  
J.A. Davidson, Merck & Co  
B.L. Clarke, Merck & Co

TABLE 1

Don Loeber, Eclipse-Pioneer-Bendix  
Elizabeth Label, BellTel Labs  
S.B. Littauer, Columbia University  
E.B. Ferrell, BellTel Labs  
Stewart Sterns, Merck & Co  
Frances Pfeiffer, Merck & Co  
                                , Johnson & Johnson  
P.S. Olmstead, BellTel Labs

TABLE 2

                                , Johnson & Johnson  
Gilbert Peakes, Bakelite Corp  
C. Scott, Merck & Co  
Philip Proctor, Johns-Manville  
Carl House, Merck & Co  
Seymour Male, Empire Brush  
Meyer Levine, Empire Brush  
A.G. Ashcroft, Alex. Smith & Sons

TABLE 3

A.G. Popowski, E.I. duPont  
Guest of Mr. Popowski  
Anne Messerve, Merck & Co  
O.P. Beckwith, Alex. Smith  
Anne Raimond, Merck & Co  
M.W. Baldwin, BellTel Labs  
Matthew Baranski, Western  
Charles J. Tantillo, U.S.

TABLE 4

Richard M. Auer,  
Mary M. Torrey, BellTel Labs  
C.G. Wurth, Western Electric  
Walter P. Koechel, Tung-Sol Lamp  
Guest of Mr. Koechel  
Alice Loe, BellTel Labs  
P.M. Dickerson, Westinghouse  
George Schleck, Merck & Co

TABLE 5

W.S. MacCrehan, N.Y. University  
 Helen Quick, BellTel Labs  
 Mr. George C. Campbell, Met. Life Ins.  
 Mrs. George C. Campbell  
 Harry Romig, BellTel Labs  
 Margaret Packer BellTel Labs  
 John Major, Personal Prods. Corp.  
 David Durand, Nat'l Bureau of Economic Res.

TABLE 7

John Tukey, Princeton Univ.  
 H.D. Doane, BellTel Labs  
 Dorothy T. Angell BellTel Labs  
 Frank J. Billiams, General Inst.  
 J.J. Gordon, Western Electric  
 W.M. Kimball, Merck & Co.  
 Geraldine Ducca, Merck & Co.  
 ,Johnson & Johnson

TABLE 6

Gardner M. Albro, E.I. duPont  
 Samuel Skolnik, Hq. Quartermaster Corp.  
 D.H. Schwartz, Hq. Quartermaster Corp.  
 Miriam S. Harold, BellTel Labs  
 H.A. Frediani, Merck & Co.  
 Sam Wilks, Princeton Univ.  
 Ellis Ott, Rutgers Univ.  
 Gertrude McAndrews, Merck & Co.

TABLE 8

T.S. Taylor, U.S. Testing Co.  
 E.B. Stumpf, Merck & Co.  
 E.G. Andrews, BellTel Labs  
 Robert S. Miller, BellTel Lab  
 J.A. Wells, Merck & Co.  
 H.W. Stuart, U.S. Pip & Fd'  
 H.H. Steiner, Western Elec

TABLE 9

Keth W. Halbert, Amer Tel & Tel  
 Roger I. Wilkenson, BellTel Labs  
 John Enell, N.Y. University  
 P.S. Baumgarner, Merck & Co.  
 , Johnson & Johnson  
 Mr. Felts, Teague, Walter Dorwin  
 , Teague, Walter Dorwin  
 , Teague, Walter Dorwin