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THE FUNCTION OF INSPECTION ENGINEERING

In recent years much has been written, especially within the Bell System, about inspection engineering. The present series of memoranda, for example, deals with many specific problems of quality control, presumably from the viewpoint of inspection engineering. In reading all of this material there is a very real danger that so many separate problems may become trees which obscure the forest through which we are traveling.

What is it that knits such discussions together? The answer is: Such discussions constitute units in the development of a science and art of fulfilling a function served by inspection engineering that is not served by any other field of engineering. The discussion of inspection engineering problems without a clear-cut statement of such an objective or function is like a ship without a rudder. The object of the present memorandum is to state briefly the concept of the function of inspection engineering that constitutes the present basis for the development of the science and art of inspection engineering.

In the production of goods to satisfy human wants there are three distinctly different and coordinate problems:



1) to determine and specify the quality of a thing wanted, 2) to make a thing that will have the quality wanted, and 3) to determine whether or not the thing when made has the quality wanted. The first step is legislative in character and must be prior to the act of making the thing; the second step is an execution of the specified process of making the thing; and the third step is judicial in character.

Stated in another way, for each piece of product made there is presumably a quality mark which the quality of that piece is to hit if it is to be considered satisfactory, adequate, dependable, and economic. The quality thus established as a standard is, to a large extent at least, the quality that the thing will exhibit after it has entered service. Hence it is that at the time the piece of product is ready to go into service we cannot be sure that it will hit the quality mark or standard. Furthermore, as I have shown elsewhere, there are certain unsurmountable difficulties in specifying in an objective verifiable way, once and for all, this standard of quality. Under such conditions, there are two definite functions of inspection engineering:

1. To interpret specifications, custom, precedent, authority, and natural law, and upon the basis of this interpretation to shape or determine the standard of quality existing for each thing at the time it goes into service.

In much the same way that every law, whether it be constitutional, legislative, or common, is what the judge interprets it to be, so likewise, the standard of quality pertaining to a particular piece of apparatus at a particular time is what the inspection engineer acting as a judge of quality interprets it to be.

2. To judge whether or not a piece of product at the time it goes into service is of standard quality and to adjudicate each complaint arising as to the quality of a thing in service upon the basis of findings as to whether or not the quality of this piece differs significantly from the appropriate standard.

In carrying out this second function each piece of product constitutes in effect a case to be tried. Inspection engineering is responsible for collecting adequate evidence for each and every case and for rendering a rational judgment upon the basis of this evidence to determine whether or not there is adequate assurance that the piece of product in question is of standard quality.¹

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1. Every act of our present inspection engineering department falls into its proper pigeonhole when viewed in the light of these functions.

