

Experimental Psychology in Personnel Problems¹

Emphasizing the Need of Additional Quantitative Analysis in Such Problems as Learning Curve and Wages, Individual Differences, Employment and Turnover

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A FELT difficulty consciously observed is the beginning of thought. More often, we are told by the historians of our science, events that might result in epoch-making discoveries arise to the level of felt difficulties and then sink without stimulating thinking. They pass by us without our realization of their importance. Unless we are artistically tempered, most of our observations of activities and phenomena disappear without analysis in this manner. It requires the artistically minded to see that all occurrences have meaning; that there is picturesqueness in them; that thinking about occurrences in some peculiar manner gives new and satisfying meanings to what were previously merely happenings. The artistically minded and the orderly minded blended in the same person gives us the scientist. To him we look for new insights and for explanations as well.

Popular psychology is well filled with examples of theories developed by one or the other of these types of mind. Phrenology, astrology, the unconscious, the censor, are artistic conceptions with little or none of the scientific intermingled. Our purely orderly minded persons develop complicated methods of wage payment, wonderfully wrought-out welfare plans, detailed regulations and laws, and complex training methods, which bear no relation to an artistic whole or to the human being to be benefited. We have recently been well supplied with answers to the question, "What does the worker want?" These answers have been "artistically" conceived, or "scientifically" wrought out. Few answers have had the two characteristics combined.

No serious cause for action can lie against those who have sought these answers in separate ways.

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Even to be able to ask the question, "What's on the worker's mind?" is an advance over great thinkers of other days. In 1675, Malebranche wrote that the total heterogeneity of the two substances, body and mind, did not permit direct knowledge of body by mind. Earlier, Geulinx had written that the mind cannot cause bodily movements; no one knows how he sets to work even to raise his arm. In 1781, Kant held that any science of nature was possible "only so far as we can employ mathematics; he specifically excluded psychology and chemistry from the natural sciences as being merely descriptive disciplines."³ Chemistry has long since taken its place among the natural sciences. We may, therefore, hopefully look forward to the time when the problems of selecting, working with and influencing men are no longer merely intuitive arts but are skillfully done because of successfully combined art and science.

To the unreflecting mind the desire for numerical orderliness and the "artistic touch" have always seemed to arise from different sources. It has been easier to say that the characteristics of man's behavior are infinite in variety than to enumerate and hold fast, for experimental purposes, to a few of them. From the viewpoint of the artistic unity, Taylor grasped the basic principle when he said in his lecture at Harvard, "The working man and the college professor have fundamentally the same feelings, the same motives, the same ambitions, the same failings, the same virtues."⁴ Such a principle does not permit us to put the question, "What does labor want?" for it recognizes two fallacies in the question at once: first, the substitution of an abstract term for living persons; second, the assumption that these people are different from others presumably not included in the class.

³Winfelband, Wilhelm, "History of Philosophy" (Translated by James Hayden Tufts), Macmillan, 1901, page 546.

⁴Copley, F. B., "Frederick W. Taylor," Harper, 1923, Vol. I, page 188.

It is not enough to recognize essential similarities among humans. After a struggle with his men, Taylor, reporting it in his testimony before the Industrial Relations Commission, said: "The main trouble with this thing is that you have been quarreling because there have been no proper standards for a day's work. . . . We make a bluff at it and the other side makes a guess at it; then we fight."⁵ He not only felt the urge that makes us kin, but also analyzed this urge into its dynamic factors. The scientific spirit led him to investigate, to think, and finally to know. When something is wrong; it is the artist in us that feels the wrong. When a complicated situation that is wrong is righted, it is due to the clear and penetrating vision of the courageous investigator who reveals the cause of the wrong.

This problem has been set us: to feel artistically and justly; to search methodically until the factors that hinder feeling are found and adjusted. Doubtless all of us feel there are specific difficulties sufficiently numerous to engage the attention of all scientifically minded men. One quotation will suffice to apply more concretely the two thoughts I have thus far had in mind.

S. N. D. North in section V of his address "Seventy-five Years of Progress in Statistics, 1839-1914," says:⁶

I have reserved reference to industrial statistics, because they are *sui generis*. They are the touchstone of the new social era upon the outskirts of which we are hovering. . . .

There is no more difficult statistical field, and none more important. The Census Office, in dealing with manufactures, has been appalled by the wage problems of the day rate, the weekly rate, the piece-price rate, often utilized side by side in the same mill—a problem in which every separate occupation in every industry may represent a different wage, in which the degree of non-employment varies constantly; in which a thousand factors enter to invalidate conclusions as to the average number of employees in a given industry, the average earning, and the actual relative share of employer and employee in the increment of industry. It is the most intricate riddle which confronts statistician and economist. Colonel Wright once remarked that "we cannot get at it by any scientific method." The answer is, that the method must be found; for the live wire of today leads into the heart of these questions.

And lo, the solution is at hand; for the statistician has appeared, and behind him is an educated public opinion, which demands that equity shall be the basis of compromise, and trusts the statistician to prove mathematically where equity lies.

⁵Op. cit., page 216.

⁶"The History of Statistics," John Koren, Editor, Macmillan, 1910, pages 39-40.

II

The struggle to introduce quantitative analysis into psychology has been a long one. I have referred above to one eighteenth century attitude toward the problem. At almost the same time, 1776, Eberhardt wrote that "the comparison of the values of images according to the degree of clearness leads to a mathematics of the soul. In the comparison of sensations with each other the unit measurement would have to be an unnoticed image which, of course, would be useless for this purpose just because it is unnoticed." In 1760, Lambert⁷ showed that this unnoticeable difference, in the field of photometry, mathematically differed but slightly from the "just noticeable difference" in brightness. Bernoulli in 1738 formulated the vague but interesting principle that the value of external possessions is to be measured by the increase which accrues to the possessor. Almost one hundred years later, in 1834, Weber formulated his law "that the recognition of the just noticeable difference is dependent entirely upon the relation of the difference to the total value."

Let the orator in the midst of a polished peroration use the colloquialism "ain't," and it strikes us with a force all out of proportion to its size or volume of sound. The quarrel between painter and plasterer as to which shall "shoot" cement on the walls of our house seems trivial in comparison with the completion of our home. The introduction of piece-rate payment frightened the employer when he calculated the money payments to be made under the new method; cutting the rate, limiting the raw material supply, shifting the extremely rapid workers to other tasks aroused a "noticeable" difference in the worker's mind and "loafing on the job" or "systematic soldiering" became a recognized though temporarily unexplainable phenomenon.

The extension and elaboration as well as the naming of Weber's law are the work of Fechner. He developed the principle and formulated the mathematical rules describing it. Since then it has been applied in various ways in the field of psychology and its theoretical aspects have even tempted the economist. Observations consonant with this generalization are often made, as I have indicated above, but the painstaking work necessary to test the assumptions are avoided. Titchener calls attention to the

⁷Klenn, Otto, "A History of Psychology," (translated by Emil Karl Wilm and Rudolph Pintner), Scribner, 1914, page 234.