

misunderstood, but, on the contrary, is appreciated and utilized as it never has been, due to an understanding of, and ability to meet individual demands and capabilities.

Presumably because some engineers have been thought to be lacking in training in psychology and other sciences that concern the human element, and because industry devotes so much attention to material output, this point has often been overlooked. When it is realized that the engineer's training is primarily in measurement and that the industries offer opportunities which no other field of activity can offer, a new aspect is given to the entire matter. Those outside industry do not always realize that leaders in psychology and other human sciences are today, and have been for years past, devoting themselves to investigations and installations in the industries,¹ and that psychology is increasingly devoting attention to industrial problems. This is well exemplified by the splendid work of the Institute of Vocational Guidance of Barcelona, which recently acted as host for an International Conference of Psychologists, which discussed many practical aspects of the relation of Psychology to Industry.² It is also exemplified by such new publications as the "Journal of the National Institute of Industrial Psychology, Founded in 1921 for the Application of Psychology and Physiology to Industry and Commerce,"³ which aims, as it states in the first editorial, to "describe in non-technical language the methods and results of applying scientific knowledge to the human aspects of industry and commerce." Those in the industries do not always realize that their strength lies not in adhering absolutely to tradition but in adapting the new methods and devices at their disposal to meet the increasing demands of the human element for opportunities and development.

Significance From the Psychiatric Standpoint.

Psychiatry, which has so much to do with the study of human likenesses and differences and with adjustment, has a great interest in the development of superstandardization. The psychiatrist has discovered many types in the industries which for one reason or another are mal-adjusted. This does not mean simply the round peg in the square hole, and does not apply

¹ See Psychology of Management, MacMillan Co., N. Y., V. D. I. Berlin.

² *Annals de L'Institut d'Orientacio Professional*, also "The Place of the Psychologist in Industry," presented at the 2nd International Conference of Psychotechnic, Barcelona, Sept., 1921.

³ Pub. by Natl. Inst. of Industrial Psychology, 329 High Holborn, London, W. C. I.

merely to those among the lower grades of employees.⁴

For example, there are two types in the industries differing greatly in some respects from the normal, one of which seems unable, without great difficulty, to acquire automaticity, the greatest of free assets of the normal worker. As a result, he actually has abnormal difficulty in performing an activity twice alike. Another type is that which craves routine and is with difficulty persuaded to attempt to learn or to be changed to another activity, even if such work has better prospects for promotion, or more constant and continuous employment.⁵

Superstandardization of method and of work, or of activity, as some of the modern psychologists prefer to call it,⁶ is of greater assistance and value in handling these types. It cannot be too often said that superstandardization, like standardization, aims in no wise to do away with initiative or with individual planning of details in work. It conforms to the principle of separating the planning from the performing, with the best planners in the planning department, and having others who may have to do planning start where the best planners finish. It classifies activity according to the amount of planning that can be done before the activity is started, or according to the amount that must be done during the period of the activity itself. It considers not only all subdivisions of processes involved in the activity down to and including the cycles of motions, but their therbligs.⁷ It thus furnishes endless opportunity for investigation of and improvement in detail such as will satisfy the most ambitious inventor, while at the same time it sets aside certain work as within the capability of even those of comparatively low mental calibre, or of abnormal mental activity, and furnishes a market for their ideas, or any self-expression that they may have pertaining to super-skill in their narrow fields.⁸

Relation to Fatigue.

Superstandardization eliminates fatigue both directly and indirectly. As applied thru Fatigue Study, it measures all those things that have to do directly with fatigue—and standardizes the best available. This

⁴ E. E. Southard, "The Mental Hygiene of Industry," Engineering Foundation reprint, Series No. 1, Feb., 1920. "The Modern Specialist in Unrest—A Plan for the Psychiatrist in Industry," *Journal of Industrial Hygiene*, II, 11-19.

⁵ "Psychiatry in Industry," *Independent*, March, 1920.

⁶ Eric Farmer, "Time and Motion Study," Pg. 16.

⁷ *June Bulletin Taylor Society*, 1921, Pg. 128.

⁸ "Motion Study of Epilepsy and Its Relation to Industry," a paper presented before the "National Association for the Study of Epilepsy," June, 1920. "Motion Study for the Handicapped," Dutton & Co., New York.

covers length of work and rest periods, working conditions, tools and equipment, desks, work benches, chairs, posture—all that effects efficient work from the fatigue standpoint.¹

As applied thru Motion Study, the improved methods induce efficient habits, reduce to habit all repetitive activities that require no individual decisions, and utilize the finest, most carefully taught type of automaticity. This reduces unnecessary fatigue to the minimum, and leaves time and unwearied attention for those decisions that are necessary and interesting.

Relation to Skill.

Since it concerns itself primarily with elements of motions, as applied to study of methods, superstandardization greatly facilitates the transference of skill. It induces confidence in its results, and determines not only the One Best Way to Do Work, but the One Best Learning Process by which to teach it. This is vital as it affects the problem of industrial education.

Need for Such Superstandardization.

A most superficial knowledge of present day conditions makes clear the need for such superstandardization. The world in general and industry in particular is going thru a period that is extremely critical. The need for increased production, the need for the maximum elimination of waste, the need for stability are everywhere evident. The relation of superstandardization to stabilization of industry and employment is, perhaps, least appreciated. Only one who has many times gone thru the experience of entering a plant that has absolutely no stability or system, and later seeing the changes that have actually been made by carefully installed standardization, can appreciate its benefits. The effects of superstandardization are similar but more intensive, since the changes made are based upon accurate measurement and are much better founded and carry more weight, as anything known to be absolutely accurate must.

Perhaps the least appreciated benefit resulting from national superstandardization is its effect upon stabilization of employment, for in times of panic manufacturers will be far less timid in manufacturing national standards, knowing that their product will surely be salable at some later date, thus turning their raw stores into assets of greater value, and meanwhile, keeping their labor turnover at a minimum figure.

There has been too much unnecessary and wasteful change in this country based upon nothing but a desire

¹ "Fatigue Study," MacMillan & Co., H. M. Vernon. "Industrial Fatigue and Efficiency," Dutton & Co.

for novelty, and embodying no element of permanence. The losses due to frequent and unnecessary change, for no reason, from one kind of work to another are not realized or appreciated by those who have not had intimate connection with a chart department recording intensive outputs and their causes for fluctuation hourly. The true causes of small outputs, high costs and low wages are never properly known by those who have not investigated the psychological factors affecting change. This does not necessarily mean that there should be no change, or less change; it may mean more change. It means less unnecessary change. Changes cost time and money. They may, under certain conditions, be worth the money, but the fact remains, as Adam Smith emphasized nearly 150 years ago, that the great cost of changing from one kind of work to another is almost universally unappreciated. Superstandardization maintains what has proved itself of greatest value, always aiming consciously at the ideal of the One Best Way, giving it the stamp of approval of permanence, and making changes that are definite, progressive and stabilizing, and that will pay in money or in durable satisfaction.

Much work in standardization has been done both in this country and abroad, but this standardization has not applied to methods and has not had in mind the One Best Way to Do Work. A careful investigation of the work of the Bureau of Standards and of the most excellent publications of the American Engineering Standards Committee illustrates this. It is an important aim of superstandardization to bring to the attention of our research bodies the necessity for standardizing the *methods* of industry as well as the *equipment*. There has not been in this country to any such extent as abroad a widespread popular interest in standardization and in the work of those bodies that handle this subject, and it is a second aim of superstandardization to arouse this interest, to foster the work already being done, and thus lead to a more rapid advance in this type of work.

Standardization in Europe.

Europe has made the most astonishing progress in standardization during the past few years because of the realization of the importance of the subject and the general cooperation in its development.

For example, in 1917 the Verein Deutscher Ingenieure, at the suggestion of the German government, organized a central national body, called the Normenausschuss der Deutschen Industrie. Its members are engineering societies, manufacturing concerns, indus-