

Marx Hardy Machiavelli Joyce Austen
Defoe Abbot Melville Montaigne Cooper Emerson Hugo
Stoker Wilde Christie Maupassant Haggard Chesterton Molière Eliot Grimm
Garnett Engels Byron Schiller
Goethe Hawthorne Smith Kafka
Cotton Dostoyevsky Hall
Baum Henry Kipling Doyle Willis
Leslie Dumas Flaubert Nietzsche Turgenev Balzac
Stockton Vatsyayana Crane
Burroughs Verne
Curtis Tocqueville Gogol Busch
Homer Tolstoy Whitman
Darwin Thoreau Twain
Potter Zola Lawrence Dickens Plato Scott
Kant Freud Jowett Stevenson Andersen Burton Harte
London Descartes Cervantes Wells Hesse
Poe Aristotle James Hastings Voltaire Cooke
Hale Shakespeare Bunner Chambers Irving
Richter Chekhov da Shaw Benedict Alcott
Doré Dante Swift Pushkin Newton
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Psychology and Industrial Efficiency

Hugo Münsterberg

Imprint

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PREFATORY NOTE

This book corresponds to a German book, which I published a few months ago, under the title *Psychologie und Wirtschaftsleben: Ein Beitrag zur angewandten Experimental-Psychologie* (Leipzig: J.A. Barth). It is not a translation, as some parts of the German volume have been abbreviated or entirely omitted and other parts have been enlarged and supplemented. Yet the essential substance of the two books is identical.

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INTRODUCTION

I

APPLIED PSYCHOLOGY

Our aim is to sketch the outlines of a new science which is to intermediate between the modern laboratory psychology and the problems of economics: the psychological experiment is systematically to be placed at the service of commerce and industry. So far we have only scattered beginnings of the new doctrine, only tentative efforts and disconnected attempts which have started, sometimes in economic, and sometimes in psychological, quarters. The time when an exact psychology of business life will be presented as a closed and perfected system lies very far distant. But the earlier the attention of wider circles is directed to its beginnings and to the importance and bearings of its tasks, the quicker and the more sound will be the development of this young science. What is most needed to-day at the beginning of the new movement are clear, concrete illustrations which demonstrate the possibilities of the new method. In the following pages, accordingly, it will be my aim to analyze the results of experiments which have actually been carried out, experiments belonging to many different spheres of economic life. But these detached experiments ought always at least to point to a connected whole; the single experiments will, therefore, always need a general discussion of the principles as a background. In the interest of such a wider perspective we may at first enter into some preparatory questions of theory. They may serve as an introduction which is to lead us to the actual economic life and the present achievements of experimental psychology.

It is well known that the modern psychologists only slowly and very reluctantly approached the apparently natural task of rendering useful service to practical life. As long as the study of the mind was entirely dependent upon philosophical or theological specula-

tion, no help could be expected from such endeavors to assist in the daily walks of life. But half a century has passed since the study of consciousness was switched into the tracks of exact scientific investigation. Five decades ago the psychologists began to devote themselves to the most minute description of the mental experiences and to explain the mental life in a way which was modeled after the pattern of exact natural sciences. Their aim was no longer to speculate about the soul, but to find the psychical elements and the constant laws which control their connections. Psychology became experimental and physiological. For more than thirty years the psychologists have also had their workshops. Laboratories for experimental psychology have grown up in all civilized countries, and the new method has been applied to one group of mental traits after another. And yet we stand before the surprising fact that all the manifold results of the new science have remained book knowledge, detached from any practical interests. Only in the last ten years do we find systematic efforts to apply the experimental results of psychology to the needs of society.

It is clear that the reason for this late beginning is not an unwillingness of the last century to make theoretical knowledge serviceable to the demands of life. Every one knows, on the contrary, that the glorious advance of the natural sciences became at the same time a triumphal march of technique. Whatever was brought to light in the laboratories of the physicists and chemists, of the physiologists and pathologists, was quickly transformed into achievements of physical and chemical industry, of medicine and hygiene, of agriculture and mining and transportation. No realm of the external social life remained untouched. The scientists, on the other hand, felt that the far-reaching practical effect which came from their discoveries exerted a stimulating influence on the theoretical researches themselves. The pure search for truth and knowledge was not lowered when the electrical waves were harnessed for wireless telegraphy, or the Roentgen rays were forced into the service of surgery. The knowledge of nature and the mastery of nature have always belonged together.

The persistent hesitation of the psychologists to make similar practical use of their experimental results has therefore come from different causes. The students of mental life evidently had the feel-

ing that quiet, undisturbed research was needed for the new science of psychology in order that a certain maturity might be reached before a contact with the turmoil of practical life would be advisable. The sciences themselves cannot escape injury if their results are forced into the rush of the day before the fundamental ideas have been cleared up, the methods of investigation really tried, and an ample supply of facts collected. But this very justified reluctance becomes a real danger if it grows into an instinctive fear of coming into contact at all with practical life. To be sure, in any single case there may be a difference of opinion as to when the right time has come and when the inner consolidation of a new science is sufficiently advanced for the technical service, but it ought to be clear that it is not wise to wait until the scientists have settled all the theoretical problems involved. True progress in every scientific field means that the problems become multiplied and that ever new questions keep coming to the surface. If the psychologists were to refrain from practical application until the theoretical results of their laboratories need no supplement, the time for applied psychology would never come. Whoever looks without prejudice on the development of modern psychology ought to acknowledge that the hesitancy which was justified in the beginning would to-day be inexcusable lack of initiative. For the sciences of the mind too, the time has come when theory and practice must support each other. An exceedingly large mass of facts has been gathered, the methods have become refined and differentiated, and however much may still be under discussion, the ground common to all is ample enough to build upon.

Another important reason for the slowness of practical progress was probably this. When the psychologists began to work with the new experimental methods, their most immediate concern was to get rid of mere speculation and to take hold of actual facts. Hence they regarded the natural sciences as their model, and, together with the experimental method which distinguishes scientific work, the characteristic goal of the sciences was accepted too. This scientific goal is always the attainment of general laws; and so it happened that in the first decades after the foundation of psychological laboratories the general laws of the mind absorbed the entire attention and interest of the investigators. The result of such an attitude

was, that we learned to understand the working of the typical mind, but that all the individual variations were almost neglected. When the various individuals differed in their mental behavior, these differences appeared almost as disturbances which the psychologists had to eliminate in order to find the general laws which hold for every mind. The studies were accordingly confined to the general averages of mental experience, while the variations from such averages were hardly included in the scientific account. In earlier centuries, to be sure, the interest of the psychological observers had been given almost entirely to the rich manifoldness of human characters and intelligences and talents. In the new period of experimental work, this interest was taken as an indication of the unscientific fancies of the earlier age, in which the curious and the anecdotal attracted the view. The new science which was to seek the laws was to overcome such popular curiosity. In this sign experimental psychology has conquered. The fundamental laws of the ideas and of the attention, of the memory and of the will, of the feeling and of the emotions, have been elaborated. Yet it slowly became evident that such one-sidedness, however necessary it may have been at the beginning, would make any practical application impossible. In practical life we never have to do with what is common to all human beings, even when we are to influence large masses; we have to deal with personalities whose mental life is characterized by particular traits of nationality, or race, or vocation, or sex, or age, or special interests, or other features by which they differ from the average mind which the theoretical psychologist may construct as a type. Still more frequently we have to act with reference to smaller groups or to single individuals whose mental physiognomy demands careful consideration. As long as experimental psychology remained essentially a science of the mental laws, common to all human beings, an adjustment to the practical demands of daily life could hardly come in question. With such general laws we could never have mastered the concrete situations of society, because we should have had to leave out of view the fact that there are gifted and ungifted, intelligent and stupid, sensitive and obtuse, quick and slow, energetic and weak individuals.

But in recent years a complete change can be traced in our science. Experiments which refer to these individual differences them-

selves have been carried on by means of the psychological laboratory, at first reluctantly and in tentative forms, but within the last ten years the movement has made rapid progress. To-day we have a psychology of individual variations from the point of view of the psychological laboratory. [1] This development of schemes to compare the differences between the individuals by the methods of experimental science was after all the most important advance toward the practical application of psychology. The study of the individual differences itself is not applied psychology, but it is the pre-supposition without which applied psychology would have remained a phantom.

II

THE DEMANDS OF PRACTICAL LIFE

While in this way the progress of psychology itself and the development of the psychology of individual differences favored the growth of applied psychology, there arose at the same time an increasing demand in the midst of practical life. Especially the teachers and the physicians, later the lawyers as well, looked for help from exact psychology. The science of education and instruction had always had some contact with the science of the mind, as the pedagogues could never forget that the mental development of the child has to stand in the centre of educational thought. For a long while pedagogy was still leaning on a philosophical psychology, after that old-fashioned study of the soul had been given up in psychological quarters. At last, in the days of progressive experimental psychology, the time came when the teachers under the pressure of their new needs began to inquire how far the modern laboratory could aid them in the classroom. The pedagogical psychology of memory, of attention, of will, and of intellect was systematically worked up by men with practical school interests. We may notice in the movement a slow but most important shifting. At first the results of theoretical psychology were simply transplanted into the pedagogical field. Experiments which were carried on in the interest of pure theoretical science were made practical use of, but their

application remained a mere chance by-product. Only slowly did the pedagogical problems themselves begin to determine the experimental investigation. The methods of laboratory psychology were applied for the solving of those problems which originated in the school experience, and only when this point was reached could a truly experimental pedagogy be built on a psychological foundation. We stand in the midst of this vigorous and healthy movement, which has had a stimulating effect on theoretical psychology itself.

We find a similar situation in the sphere of the physician. He could not pass by the new science of the mind without instinctively feeling that his medical diagnosis and therapy could be furthered in many directions by the experimental method. Not only the psychiatrist and nerve specialist, but in a certain sense every physician had made use of a certain amount of psychology in his professional work. He had always had to make clear to himself the mental experiences of the patient, to study his pain sensations and his feelings of comfort, his fears and his hopes, his perceptions and his volitions, and to a certain degree he had always tried to influence the mental life of the patient, to work on him by suggestion and to help him by stimulating his mind. But as far as a real description and explanation of such mental experiences came in question, all remained a dilettantic semi-psychology which worked with the most trivial conceptions of popular thinking. The medical men recognized the disproportion between the exactitude of their anatomical, physiological, and pathological observation and the superficiality of their self-made psychology. Thus the desire arose in their own medical circle to harmonize their psychological means of diagnosis and therapy with the schemes of modern scientific psychology. The physician who examines the sensations in a nervous disease, or the intelligence in a mental disease, or heals by suggestion or hypnotism, tries to apply the latest discoveries of the psychological laboratory. But here, too, the same development as in pedagogy can be traced. The physicians at first made use only of results which had been secured under entirely different points of view, but later the experiments were subordinated to the special medical problems. Then the physician was no longer obliged simply to use what he happened to find among the results of the theoretical psychologist, but carried on the experiments in the service of medical problems.

The independent status of experimental medical psychology could be secured only by this development.

In somewhat narrower limits the same may be said as to the problems of law. A kind of popular psychology was naturally involved whenever judges or lawyers analyzed the experience on the witness stand or discussed the motives of crime or the confessions of the criminal or the social conditions of criminality. But when every day brought new discoveries in the psychological laboratory, it seemed natural to make use of the new methods and of the new results in the interest of the courtroom. The power of observation in the witness, the exactitude of his memory, the character of his illusions and imagination, his suggestibility and his feeling, appeared in a new light in view of the experimental investigations, and the emotions and volitions of the criminal were understood with a new insight. Here, too, the last step was taken. Instead of being satisfied with experiments which the psychologist had made for his own purposes, the students of legal psychology adjusted experiments to the particular needs of the courtroom. Investigations were carried on to determine, the fidelity of testimony or to find methods for the detection of hidden thoughts and so on. Efforts toward the application of psychology have accordingly grown up in the fields of pedagogy, medicine, and jurisprudence, but as these studies naturally do not remain independent of one another, they all together form the one unified science of applied psychology. [2]

As soon as the independence of this new science was felt, it was natural that new demands and new problems should continue to originate within its own limits. There must be applied psychology wherever the investigation of mental life can be made serviceable to the tasks of civilization. Criminal law, education, medicine, certainly do not constitute the totality of civilized life. It is therefore the duty of the practical psychologist systematically to examine how far other purposes of modern society can be advanced by the new methods of experimental psychology. There is, for instance, already, far-reaching agreement that the problems of artistic creation, of scientific observation, of social reform, and many similar endeavors must be acknowledged as organic parts of applied psychology. Only one group of purposes is so far surprisingly neglected in the realm of the psychological laboratory: the purposes of the economic

life, the purposes of commerce and industry, of business and the market in the widest sense of the word. The question how far applied psychology can be extended in this direction is the topic of the following discussions.

III

MEANS AND ENDS

Applied psychology is evidently to be classed with the technical sciences. It may be considered as psychotechnics, since we must recognize any science as technical if it teaches us to apply theoretical knowledge for the furtherance of human purposes. Like all technical sciences, applied psychology tells us what we ought to do if we want to reach certain ends; but we ought to realize at the threshold where the limits of such a technical science lie, as they are easily overlooked, with resulting confusion. We must understand that every technical science says only: you must make use of this means, if you wish to reach this or that particular end. But no technical science can decide within its limits whether the end itself is really a desirable one. The technical specialist knows how he ought to build a bridge or how he ought to pierce a tunnel, presupposing that the bridge or the tunnel is desired. But whether they are desirable or not is a question which does not concern the technical scientist, but which must be considered from economic or political or other points, of view. Everywhere the engineer must know how to reach an end, and must leave it to others to settle whether the end in itself is desirable. Often the end may be a matter of course for every reasonable being. The extreme case is presented by the applied science of medicine, where the physician subordinates all his technique to the end of curing the patient. Yet if we are consistent we must acknowledge that all his medical knowledge can prescribe to him only that he proceed in a certain way if the long life of the patient is acknowledged as a desirable end. The application of anatomy, physiology, and pathology may just as well be used for the opposite end of killing a man. Whether it is wise to work toward long life, or whether it is better to kill people, is again a problem which lies out-

side the sphere of the applied sciences. Ethics or social philosophy or religion have to solve these preliminary' questions. The physician as such has only to deal with the means which lead toward that goal.

We must make the same discrimination in the psychotechnical field. The psychologist may point out the methods by which an involuntary confession can be secured from a defendant, but whether it is justifiable to extort involuntary confessions is a problem which does not concern the psychologist. The lawyers or the legislators must decide as to the right or wrong, the legality or illegality, of forcing a man to show his bidden ideas. If such an end is desirable, the psychotechnical student can determine the right means, and that is the limit of his office. We ought to keep in mind that the same holds true for the application of psychology in economic life. Economic psychotechnics may serve certain ends of commerce and industry, but whether these ends are the best ones is not a care with which the psychologist has to be burdened. For instance, the end may be the selection of the most efficient laborers for particular industries. The psychologist may develop methods in his laboratory by which this purpose can be fulfilled. But if some mills prefer another goal,—for instance, to have not the most efficient but the cheapest possible laborers,—entirely different means for the selection are necessary. The psychologist is, therefore, not entangled in the economic discussions of the day; it is not his concern to decide whether the policy of the trusts or the policy of the trade-unions or any other policy for the selection of laborers is the ideal one. He is confined to the statement; if you wish this end, then you must proceed in this way; but it is left to you to express your preference among the ends. Applied psychology can, therefore, speak the language of an exact science in its own field, independent of economic opinions and debatable partisan interests. This is necessary limitation, but in this limitation lies the strength of the new science. The psychologist may show how a special commodity can be advertised; but whether from a social point of view it is desirable to reinforce the sale of these goods is no problem for psychotechnics. If a sociologist insists that it would be better if not so many useless goods were bought, and that the aim ought rather to be to protect the buyer than to help the seller, the psychologist would not object.

His interest would only be to find the right psychological means to lead to this other social end. He is partisan neither of the salesman nor of the customer, neither of the capitalist nor of the laborer, he is neither Socialist nor anti-Socialist, neither high-tariff man nor free-trader. Here, too, of course, there are certain goals which are acknowledged on all sides, and which therefore hardly need any discussion, just as in the case of the physician, where the prolongation of life is practically acknowledged as a desirable end by every one. But everywhere where the aim is not perfectly a matter of course, the psychotechnical specialist fulfills his task only when he is satisfied with demonstrating that certain psychical means serve a certain end, and that they ought to be applied as soon as that end is accepted.

The whole system of psychotechnical knowledge might be subdivided under either of the two aspects. Either we might start from the various mental processes and ask for what end each mental factor can be practically useful and important, or we can begin with studying what significant ends are acknowledged in our society and then we can seek the various psychological facts which are needed as means for the realization of these ends. The first way offers many conveniences. There we should begin with the mental states of attention, memory, feeling, and so on, and should study how the psychological knowledge of every one of these mental states can render service in many different practical fields. The attention, for instance, is important in the classroom when the teacher tries to secure the attention of the pupils, but the judge expects the same attention from the jurymen in the courtroom, the artist seeks to stir up the attention of the spectator, the advertiser demands the attention of the newspaper readers. Whoever studies the characteristics of the mental process of attention may then be able to indicate how in every one of these unlike cases the attention can be stimulated and retained. Nevertheless the opposite way which starts from the tasks to be fulfilled seems more helpful and more fundamentally significant. The question, then, is what mental processes become important for the tasks of education, what for the purposes of the courtroom, what for the hospital, what for the church, what for politics, and so on.