c. The group represented by Dewey and Mc Dougall, who hold that conduct is the biologically purposive self-expression of an organism, and that in addition to mechanical, physical-neural reflexes there are operative inherited instincts or impulses and a capacity for consciousness independent of but utilizing the individual's mechanical equipment.

d. The psychoanalist group, influenced by Freud and Jung, whose concepts are not yet clearly formulated and whose contribution cannot yet be definitely measured, but who have undoubtedly made an important contribution to psychology. This group attaches great importance to instincts and emotions, and especially to the suppression of instincts and emotions, as the key to the explanation of the varieties of human conduct.

3. That notwithstanding the differences among psychologists with respect to the nature and origin of conduct and with respect to methodology, interest has focused largely on investigation of instincts, habit and intelligence—whatever their origin—both as causes and manifestations of behavior; and there seems to be agreement that a better understanding of these is essential to the formulation of principles relating to the interpretation and control of conduct.

4. That under the direction given by James, psychology is becoming an empirical and positive science: "'empirical' to mark the fact that psychology relies upon the great method common to all natural sciences, namely, observation of concrete facts and the induction of general rules or laws from these concrete particulars, rather than upon deduction from any *a priori* principles; 'positive' to mark it as the science of mind as it actually exists and operates, to distinguish it from the sciences primarily concerned with the ideals, norms, standards, or rules of right thinking and conduct."[7]

5. That as an empirical and positive science psychology has so far been compelled to conduct its research principally in laboratories, in the controlled observation of animals, and in a very limited way in the less controlled observation of humans; secondarily in public institutions in more or less controlled observation of defectives; and to a limited extent in the schools, in more or less adequately controlled observations of young people.

6. That as an empirical and positive science, psychology has had too little opportunity to conduct controlled research in industry with respect particularly to the special characteristics of *adult* behavior following employment—industry's vital concern.

7. Finally, that most psychologists are conservative in their claims with respect to present achievements, although they are confident of ultimate results; that the most they claim is to have discovered a few basic principles—such as that of great differences in the inherited characteristics and aptitudes of individuals—differences which, however measured, tend to cluster about the norm; to have devised and begun the verification of certain tools for the use of society—such as intelligence tests; and to have acquired a new point of view and a new technique of research.

IV.

Our particular interest is in industrial psychology, and because experience makes us more competent to appraise results in that field, we are likely to come away from our preliminary survey with more definite impressions concerning industrial psychology, perhaps somewhat as follows:

1. That the actual results of research in the field of industrial psychology during the past fifteen years have been relatively meager. It must be acknowledged that to have made a beginning is of greatest significance; but it must be acknowledged also that that beginning has been but a beginning, a scratching of the surface of the problem. Certain limited researches in the field of selling and of advertising; certain limited researches with respect to the determination of special aptitudes for special operations; and certain researches with respect to the construction, verification and valuation of general intelligence tests;—these about complete the list. We have *discussed* imitation, monotony, automaticity, instincts of self-expression, creative effort, and so on; but there have been practically no controlled researches in industry with respect to these, and most of our talk has consisted of hypotheses based on an as yet incomplete psychology of animals and of children.

2. That most, although not all, of these achievements have been in the nature of probability formulae or correlations resulting from quantitative measurements; and while these are of utility under special conditions, they have not led to the discovery of causes of conduct or fundamental laws for the guidance of management in influencing conduct.

3. That most of the achievements in industrial psychology have pertained to very special aspects of management, such as the selection of workers; and have not yet touched the real management problem,

[7]McDougall, "Outline of Psychology," p. 38.

that of inspiring interest, understanding, initiative, effort, precision, and personal effectiveness in cooperative activity.

In fact, we cannot yet say we have an industrial psychology. I would not be understood as unappreciative of the value of tests—intelligence, special aptitude and other; or of the value of probability formulae pertinent to the reaction of consumers to color, type, format, and other features of advertising copy; or of the psychological characteristics of attention, attraction, persuasion and the dynamics of getting the signature on the dotted line. But my mission this evening is to help to establish a correct perspective, and particularly to impress our membership that industrial psychology is only in its infancy, and that the problem of this society is not the simple one of calling upon psychologists to deliver at once usable laws and principles, but the serious one of determining how we can cooperate in affording facilities for further research.

V.

In appraising the contributions of psychology to industry we must distinguish between the contribution of *tools to use* in management and the contribution of *principles to assist in the art* of management.[8] It is interesting that the contribution of those psychologists who claim to be most scientific—who use the laboratory and the method of quantitative measurement—is tools to use in certain definite managerial operations, such as intelligence tests in selection and measurement of reactions to copy, type and color in advertising; while the contribution of those psychologists who are rated less scientific[9] by those of their colleagues who interpret the word scientific in a narrow way, offers most with respect to general principles to assist in the art of management. General psychology has already discovered much of value for the executive which has not been translated into the language of industrialism. The problem of management is essentially the problem of inspiring, leading and teaching men in cooperative effort; it is concerned only to a limited extent with definite unit reactions to definite unit stimuli; it is to a much greater extent concerned with organic reactions to composite stimuli. Psychologists like James, Dewey, Woodworth and Tansley and social scientists like Wallas, Cooley and Ross have furnished industry, in psychological and sociological literature, some of the best textbooks on management. In these books may be found a wealth of hypotheses and even of principles which will prove to be of great value to industrial executives in solving what they consider the major problems of management.

VI.

In that more extensive and intensive research which I should like to see this Society inspired to promote, I hope the psychologists will be able to give more attention, because of facilities to be offered by industry, to what I call adult psychology. I recognize that psychologists generally are not likely to sanction a distinction between animal and youth psychology on the one hand and adult psychology on the other hand, which has been suggested several times in this paper. Their attitude generally is that of one psychology for all animal life. To quote an eminent authority: "It seems probable that mind has the same nature wherever and whenever it exists or manifests itself, whether in animals, men, or superhuman beings, whether in the new-born infant, the fool, or the wise man."[10] Yet the psychologists who have that point of view seem generally to agree that in the minds of human beings intelligence and consciousness are sufficiently different, qualitatively or quantitatively, from those same elements of the animal mind as to make them matters of special consideration. Similarly it seems to me to be an interesting and important question whether there are not differences between the infant and the adult human with respect to the relative parts played in conduct by instinct or impulse, habit, and intelligence. If research should prove that there are such differences, it would be of the greatest importance to management. For management is concerned, in its day-to-day problems, much more with adults than with the young—adults who have established habit patterns under a great variety of chance conditions and who by chance have been brought together into cooperative activity.

Most psychologists seem to overemphasize the part played by instincts and underemphasize the part played by habits.[11] This may be because research and experiment have been principally with animals, in which instincts are relatively few and conspicuous, and with

[8]This distinction was called to my attention by Mr. E. D. Smith, Dennison Manufacturing Company, Framingham, Mass.

[9]I do not subscribe to this rating.

[10]McDougall, "Outline of Psychology," p. 35.

[11]e.g.—"Habit too much used as an explanatory principle," McDougall, "Outline of Psychology," p. 177. However, this was not true of James and is not true of Dewey.