backward in democratic organization as men of science; there is no other in which conditions make the right kind of organization more necessary. . . . Science has not only supplied the economic basis for our civilization; it has not only made economic slavery wanton and intolerable; it has freed us from superstition and unreason; it is in itself the most perfect art and the best religion, the force not ourselves that makes for truth and righteousness."

He maintained that the workers in science should share in the profits of their own discoveries and he strongly favored the taking out of patents on scientific discoveries, so that profit might go for the promotion of research rather than for the enrichment of capitalists. In 1921 he organized the Psychological Corporation for the purpose of selling the services of psychology and psychologists to the public—all income and profits to be used for the promotion of psychological research. He always stood firmly for the rights of the workers in any field and against those persons and agencies that would exploit the workers.

His criticisms of university organizations which placed great power over professors in the hands of deans, presidents and trustees was unsparing. He wrote, "The department or group should name its head and those to be added to it. The teachers or professors should name their deans and their president should be responsible to them. The trustees should be trustees, not regents or directors." In 1912, 1913 and again in 1914 he proposed that there be organized "an American Association of University Professors, similar to the medical and bar associations, which would be an influential force in improving the conditions under which our work is done," and he later took an active part in founding and promoting this association.

He feared "the Greeks bearing gifts and then taking them away," and he did not hesitate to criticise severely the policy of the Carnegie Foundation for the Advancement of Teaching, pointing out that the income of that Foundation would not be sufficient to pension, on the plan first proposed, the retiring professors in a single large university at the end of forty years. His estimates were later found to be much more nearly accurate than those of the actuaries who had advised the Foundation.

He always had the courage of his convictions and did not hesitate to advocate any action he considered right or to condemn any he thought wrong, however unpopular his position might be. This quality sometimes got him into trouble with university or public authorities, but he was so generally right that he usually won his fight in the end. He occupied a unique position among American men of science and he did more than any other man of his generation to bring about the organization of science in America.

CONTRIBUTIONS TO PSYCHOLOGY AND EDUCATION

By Dr. EDWARD L. THORNDIKE

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CATTELL graduated from college in 1880. From then until 1894, when he became editor of SCIENCE, his life was devoted exclusively to study, teaching and research in psychology. In those years he made and published important contributions on psycho-physics, reaction time, perception and association. Much of his work during this period consisted in doing what other psychologists had done, but with more ingenuity, precision and wisdom. He was notably successful in exposing artificialities, pedantries and loose thinking in the work of others and avoiding them in his own. He also opened up new lines of psychological investigation. Among these was the adequate treatment of individual differences in mental abilities, propensities and forms of behavior. Galton had already shown the importance of such differences, but psychologists still tended in general to hide human diversities in averages or even to discard them before computing the averages. In his very first published research, Cattell exemplified the proper treatment of them. In his paper of 1890 on "Mental Tests and Measurements" and in the systematic collection of measurements of individuals begun at Pennsylvania and continued at Columbia, he led the way in what has become a very large part of psychology. His abilities and achievements won early recognition in the form of a professorship in the University of Pennsylvania at the age of twenty-eight, the headship of the department of psychology at Columbia at thirty-one, and the presidency of the American Psychological Association at thirty-five.

In the ten years after his assumption of editorial and financial responsibility for SCIENCE, Cattell was a thorough student of psychology and a competent guide to investigators in the Columbia laboratory; but he relaxed his own investigations and his original contributions were limited to two reports: "On Relations of Time and Space in Vision" in 1900 and "The Time of Perception as a Measure of Differences in Intensity" in 1902. From 1905 on he was increasingly a man of

science in general rather than of any one science, an editor rather than an experimenter, an organizer and manager rather than a student.

It is interesting to speculate on what would have happened if he had stuck as closely to psychology as his teacher Wundt did in Germany or his friend and contemporary, Jastrow, did in America. I think that the methods of experimental psychology, educational psychology and social psychology would have been sounder and that their progress would have been along somewhat more desirable lines than has been the case. At the turn of the century Cattell was by far the most likely candidate for active leadership in American psychology. If he had been such an active leader for thirty years or more, certain schools of psychology might well have been less bigoted and many individuals saved from one or another pedantry or folly.

He chose to become both a leader and a servant, and of American science as a whole rather than of only psychology. And nobody should regret his decision. Take only one aspect of his work—the provision of an impartial journal in which for a half century any reputable man of science could set forth any honest opinion about any matter of importance to science, from the most specialized and technical to the most general or controversial—and ask what services as a psychologist could have equalled that.

During the last half of his life Professor Cattell's investigations in psychology consisted chiefly of certain measurements taken of himself, and not yet published and of statistical studies of the data gathered for successive editions of "American Men of Science." He resigned from co-editorship of the *Psychological Review* in 1904. He did not cease to be a psychologist, even after he was the editor and publisher of four important periodicals, two of them weeklies, but his leadership was in psychological affairs rather than in psychological thought and experimentation.

He was made president of the International Congress of Psychology held in this country in 1929. In 1921 he founded the Psychological Corporation, a unique organization to promote applied psychology, and was its president for many years and later the chairman of its board of directors.[1]

Cattell believed in the possibility of a science of education and was on the lookout for educational implications in his experiments on perception, association and individual differences. He had theories about the educative process, notably the theory that a home with many children of different ages was in certain respects superior to a classroom filled with children as nearly alike as possible. He had pronounced views about the management of universities, as shown in his volume of 1913 on "University Control." His most valued work for education was as organizer and editor. He induced the American Association for the Advancement of Science to establish the Section on Education, and worked to make it a success. He devoted much time and thought to the better education of the public in matters of science through the newspapers, in connection with the administration of the Scripps bequest, and was the president of Science Service from 1928 to 1937. In 1915 he founded *School and Society* as a dignified weekly journal for education in all its aspects, was its owner and editor until a few years ago, and arranged for its continuance under suitable auspices.

AS I KNEW HIM IN THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

By Dr. BURTON E. LIVINGSTON

THE devoted interest of J. McKeen Cattell in the organization of men and women of science in this country and Canada entered upon a new phase through the reorganization of the American Association at the end of the year 1919, when the present constitution of the association was ratified at the third St. Louis meeting. That constitution had been prepared by J. McKeen Cattell, E. L. Nichols, H. L. Fairchild and D. T. MacDougal. Among other innovations then introduced, the Executive Committee of the Council was established, virtually replacing the earlier Committee on Policy and the General Committee. To the Executive Committee was allocated a large degree of influence and power. In the years since its organization it has executed commitments from the Association Council, has made recommendations to the Council and has acted legally for the Council in making many important decisions in the interims between association meetings, when the prime body could not take action. Cattell was an influential member of the new committee from its beginning in the spring of 1920 and he became its permanent chairman in 1925, continuing in that office till his resignation in 1941.

[1] A more adequate account of Cattell's work as a psychologist will be found (a) in an article by R. S. Woodworth which will appear soon in the *Psychological Review*, and (b) in a number of the *Archives of Psychology* (No. 30, April, 1914) entitled, "The Psychological Researches of James McKeen Cattell," prepared by his pupils to celebrate his completion of twenty-five years of service as professor of psychology.