

How Can Genius Be Discovered?

Psychology

Thomas A. Edison, master inventive genius of his age, is looking for a successor. Forty-nine promising youths, scholastic science leaders of their states, will be nominated by governors and sent to Mr. Edison's laboratory to be subjected to one of the famous Edison questionnaires. A scholarship will be given to the winner.

Six of America's leading psychologists, students of human abilities, have been asked by Science Service to comment on genius and tell how they would pick budding Edisons. Their suggestions, the results of years of study, should aid Mr. Edison and others in locating exceptional individuals and affording them opportunities.

National Search Urged

By LOUIS M. TERMAN

Professor of Psychology, Stanford University, and Author of "Genetic Studies of Genius"

The prospect for a nation-wide search for scientific genius grips the imagination. Mr. Edison's provision for this search is one of the most creative, challenging, and daring of all his undertakings.

True, neither science nor common sense has yet solved the riddle of genius, but psychology has made a beginning. There is nothing about genius that is not amenable to scientific investigation. Sometime the budding geniuses in every intellectual and artistic field will be discovered early, tended and looked after as the most prized asset of the nation. Even now the search need not be a blind one. It is possible to identify with considerable certainty the youth who is endowed with scientific talent.

The search should be in charge of a small committee composed of psychologists and physical scientists with a similar cooperating committee in each state. Every high school senior class in the country should be sifted. In this the universal and enthusiastic cooperation of the schools could be expected.

No single technique exists which would be adequate by itself. The principle of progressive sifting should be adopted. First, one or more batteries of intelligence tests should be used. Those rating high in intelligence should be given the David Zyve or a similar test of scientific aptitude. Those surviving this test should be given the E. K. Strong or similar test for measurement of scientific interests. Tests of character

and personality traits should follow. Survivors to this point should be rated by competent judges for such traits as industry, persistence in the face of difficulty, unselfishness, cooperativeness, objective-mindedness, and health.

The ratings would be based in part upon observation to supplement the test results. Final selection would be improved by giving some weight to a heredity rating based upon the qualities shown by blood relatives including parents, grandparents, uncles, aunts, and cousins.

The greatest mistake, in short, would be to rely too heavily on a single narrow scope of technique. Finally, the whole bet should not be staked on one horse. If the ten most promising are selected and trained Mr. Edison will have a better chance of finding ultimately the one individual he wants.

Highest Tenth Good Material

By KNIGHT DUNLAP

Professor of Psychology, Johns Hopkins University, and Chairman, Division of Psychology and Anthropology, National Research Council

How would I pick a single genius? I wouldn't. To find the most promising group out of a large class of high-school students, I should pick out the quartile of the class making the best school record. As a second elimination contest any good achievement or intelligence test would sort out the highest tenth. But which of these, if any, would prove to be a major contributor to the world's progress no one could predict. Mr. Edison might just as well take the brightest boy in Jersey City or in Lancaster and give him the opportunity of becoming an electrical wizard as to carry the quest through forty-eight states and attempt to pick a potential genius.

Takes Genius to Discover Genius

By ARNOLD GESELL

Director Psycho-Clinic, Yale University, author of many investigations on child development

Genius comes in many different forms, and there is no general type. Edison has one kind of genius, Einstein another, Kreisler still another. Deliberately to go about finding a successor for any great man it would be necessary to make an inventory of the actual qualities desired and to specify the particular combination in which they are preferred. Genius

comes in patterns, not in doses. The qualities would include somewhat general factors like energy, pertinacity, insight, imagination, and the capacity for growth. But they would also include specific habits of work, modes of thought, fields of interest, likes, dislikes, motivations. They would include forms of skill, technical training and knowledge.

An informational questionnaire may measure directly some aspects of intellectual equipment. Only very imperfectly such a questionnaire discloses characteristics which are frequently, but not necessarily associated with certain kinds and degrees of inventiveness.

Science is making definite progress in the measurement of mental ability. Capabilities of the highest order, however, cannot be adequately measured by any known device. They cannot even be justly estimated except by thorough-going and judicious appraisal of numerous factors. The capacity for sustained growth is one of the most important but most difficult to assess.

It almost takes a genius to discover a genius, especially a young one.

Personnel Expert Tells How

By WALTER V. BINGHAM

Director, Personnel Research Federation, and President, Psychological Corporation

There can be no successor to Edison. In his place there will be a whole group of investigators working together. The day has passed when one inventor, no matter how brilliant, can outstrip the organized cooperative efforts of a great research laboratory.

But such laboratories need young men of precisely the type Edison is seeking. When the candidates are brought to Orange in order to select the most promising from the entire country, at least two or three days should be allowed for the examinations. The competition might well make use of some of the well standardized tests of scientific and mathematical ability, mechanical ingenuity, logical memory, and constructive imagination or inventiveness. The battery of tests should include Zyve's tests of scientific aptitude, Thurstone's tests of special thinking, and the Minnesota mechanical ability tests together with such measures of ingenuity as the Carnegie imagination test, Ruger's puzzles, and O'Connor's block assembly. (*Turn to next page*)

Opportunities

Education

While scientifically inclined youths throughout the country make ready to compete for the privilege of training to succeed Thomas A. Edison, a survey indicates that thousands of opportunities await the ambitious and gifted student.

It is estimated that at least 10,000 scholarships are offered annually by American universities and colleges to those taking undergraduate work or about to enter college. Some of these offer full tuition, a few provide living expenses as well and many lend a helping hand to the student's own efforts. Such scholarships allow the student to complete his four years of study leading to a bachelor's degree. A large percentage of them are available for study in the sciences.

When the student has obtained his undergraduate degree and desires to do advanced graduate work in science, some 600 scholarships or fellowships await in science subjects. This is estimated to be the number available in American universities.

To carry training further, to afford opportunity for actual research work under favorable conditions in the laboratories of great teachers and scientists here and abroad, the National Research Council, Washington, administers some 125 research fellowships in medicine, physics, chemistry, biology and allied sciences. Committees of leading scientists choose the fellows on the basis of their training and abilities. Some are given an opportunity to work in agriculture, forestry, and other such branches as well as the more theoretical sciences.

About 80 men and women, among them artists and writers as well as scientists, are given fellowships annually by the John Simon Guggenheim Foundation, New York, to carry on work abroad. The National Research Council and the Guggenheim fellowships are for more mature individuals and possession of a Ph.D. degree or the equivalent is a necessary requisite in most cases. These fellowships are sufficiently generous to allow the holders to pursue their studies without financial worries.

Science News-Letter, May 11, 1929

To carry out Tokyo's plans for rebuilding and city planning since its earthquake, many property owners are being forced to give up one-tenth of their land without compensation, for highway construction purposes.

Careers in Science

Education

Any student considering making science his life work needs advice and information in order that he may apply his peculiar abilities to the best advantage. The National Research Council for the past decade has given special attention to the opportunities which are open to the gifted student. In connection with this work several informative pamphlets have been issued. Among those still available for free distribution in limited number to those seriously interested are: "An Open Letter to College Seniors" by Prof. Carl E. Seashore; "The Gifted Student and Research," by Prof. Carl E. Seashore; "Agriculture

Research as a Career," by Dr. E. D. Ball; "The Field for Chemists," by Dr. Wilder D. Bancroft; "Engineering Research as a Career," by Dean A. A. Potter; "Forestry as a Career," by Dean Henry S. Graves; "Geology as a Career," by Prof. James F. Kemp; "Mathematics as a Career," by Prof. C. J. Keyser; "Research in the Medical Sciences," by Prof. Frederick P. Gay; "The Research Career in Public Health," by Dr. David L. Edsall; "Zoological Research as a Career," by Dr. C. E. McClung. Requests should be addressed to the National Research Council, B and 21st Streets, Washington, D. C.

Science News-Letter, May 11, 1929

Search for Genius—Continued

Three hours should be set aside for the Thorndike test of abstract intelligence.

Edison's questionnaires, to judge from those which have been published, are not reliable enough. He seems never to have applied to them the rigorous scientific standard of verification which he imposes on his physical and chemical researches. The separate items in the questionnaires need severe pruning and experimental validation. If an information test were to be included in the battery I would use the Inglis vocabulary test as revised by O'Connor. Strong's interest analysis for revealing engineering aptitude would help. The physique of the candidates should also be compared by measuring their endurance and output of energy. Finally their individual rankings in all the separate examinations should be properly weighed and combined in a convenient and statistically sound manner. If there is a mind like Edison's among the candidates this is the surest way to find it.

Search Will Stimulate Young Inventors

By DONALD A. LAIRD
Director, Psychological Laboratory, Colgate University, and Editor of "Industrial Psychology"

Very few men like Edison appear in a century and it will tax the wizard himself to pick a successor. Even though he may not uncover a genius of his peculiar calibre—and I doubt if he will—he is unquestionably doing a great deal through his search to stimulate the interest of a large number of young men in looking toward

the future inventive developments of our civilization.

It is to be hoped Edison will impress upon the forty-nine most promising the importance in coming years of directing inventive efforts to man's mental equipment, which his own search shows he realizes is vital to carry on our civilization without a lopsided development. His questionnaire will give an approximate measure of the practical general intelligence of the candidates which is important for inventive genius. But how to measure the emotional drives and real desire for achievement which are also important is still a problem. These non-intelligence factors may be more necessary than mere knowledge and intelligence.

Careers Should Be Followed

By L. J. O'ROURKE
Director of Personnel Research, U. S. Civil Service Commission

Mr. Edison's experiment will stimulate general interest in the subject of special aptitudes and individual differences. The 49 different methods adopted by the governors and the District of Columbia commissioners should challenge research students to improve our methods of selecting those with talent.

It would be interesting, though difficult, to follow the contributions to science made by the competitors making high and low scores on the test given by Mr. Edison.

Science News-Letter, May 11, 1929

The magnetic poles are more than 1,000 miles away from the geographic poles.