CAN WE FORECAST THE TRAITS OF OUR CHILDREN?

Dr. Kellogg, of the National Research Council, Says That the Day Is Approaching When Science Will Be Able to Answer the Question With Certainty Through the Application of an Old Law

BY WILLIAM ATHERTON DU PUY.

"THE power of prophecy so dear to the scientist and that power so craved by prospective parents, of knowing in advance what manner of children are to be born to them, promise to become realities in view of the rapidly increasing knowledge of the biologist," says Dr. Vernon Kellogg, secretary of the National Research council.

"It looks as though the time were approaching," he continued, "when it will be possible to take two individuals who are about to be married, chart the qualities that they possess and make a table which will show the proportions in which those qualities reappear in their offspring.

"It is impossible to say whether members of future generations will use this information when they come to select their mates, or whether governments wil apply it in forming judgment as to what races they will admit into their citizenship. The facts, however, will be available and an infinite variety of opportunity which cannot now be forecast will present itself for their utilization."

Weight is given the utterances of this man of science because of his position with the National Research council, which is virtually the liaison between the scientific world, represented by the national academy of science, the government and the public. Its purpose is to stimulate research in science on the one hand and its useful application on the other. Dr. Kellogg came to his present post after many collegiate years, chiefly at Stanford university.

"Definite laws of heredity are being established," he continued. "Take this illustration of one such law. I have crossed two varieties of silk worms, one of which spun cocoons that were white. I have found that the first generation of silkworms resulting spun only yellow cocoons. It appeared that the white-spinning silkworms had lost their identity. A second generation was bred by crossing two of these yellow spinners, however and it was found that they were part yellow spinners and part white spinners. The proportions of whites and yellows were always mathematically the same. The white spinners in the second generation produced all white spinners in the third. Certain of the yellow spinners produced always yellow and certain of them produced mixed generations in definite proportions. But the results were always the same. A definite fact of hereditary action is established with relation to these silkworms.

"The law which I was demonstrating with my silk worms was discovered 50 years ago by the Austrian monk, Gregor Mendel, who worked for years crossing contrasting varieties of peas in his monastery garden. It has since been substantiated in hundreds of instances, with plants, with rats, with chickens, with man. It is one of the most definite and greatest biological laws that was ever discovered. Mendel is just coming to be appreciated as a scientist to be mentioned in the same breath with Darwin. It is only in this generation that his law has come to be practically applied.

"Luther Burbank depends on the known facts of heredity in his development of new varieties of plants. He knows what to expect when he makes crosses. He can tell the varieties he wants to preserve without waiting for them to come to fruitage. He would have been able to have accomplished twice as much in his life had he known the Mendelian law from the beginning.

"Experiment is necessary to determine what will result from different crosses. A certain variety of black chicken crossed with a certain variety of white chicken results in a compromise color between the two parents of blue. But when such blue forms are crossed the brood includes not only blue chickens, but black ones and white ones, and all these in definite proportions."

"If a pronounced type of blonde Scandinavian married an equally pronounced type of brunette Italian," I asked, "what would be the result?"

"That I do not know," Dr. Kellogg answered. "Scientific men have not made sufficient observation in such cases to reach conclusions. It will take longer to establish scientific facts with relation to human beings, because they cannot be experimented with, and the offspring is limited in numbers.

"But here is the important thing: Human qualities are inherited, according to definite laws, both physical and mental qualities, just as the various traits are inherited in plants and animals. We are making rapid strides toward learning what these laws are.

"Now, an interesting question arises when an Englishman marries a Spanish woman: Will the children have the English or the Spanish mentality? Will they fit into the idea of democratic or monarchial government? This is a fact that the students of heredity will some time establish."

"The benefits that such nations as the United States may derive from this knowledge of combinations of races are very obvious. So young is this practical study of heredity that definite facts along this line are only beginning to be well established. It is generally held that when two races intermarry, the resultant generation will be like the more aboriginal. This is because these aboriginal traits are more firmly established than are the civilized traits.

"When an attempt is made to determine what traits in parents are handed down to their children the same principle probably controls. A father may have a Roman nose and a mother a pug nose. The Roman nose may have come down as a family trait for 5000 years. The pug nose may be a characteristic that occurs but spasmodically in the mother's family. The children are more likely to take this feature from the father. It is the same with other personal characteristics."

"From which parent does the child inherit most?" I asked.

"There is nothing to indicate that either has the advantage in controlling characteristics," the biologist replied. "Here is another interesting point that seems to be established. The child of a blond mother and a brunette father may be a pure blond. That does not mean that it is more likely to possess other characteristics of the mother. If it gets 12 traits from its parents it fights out the dominance of each of hose traits separately. This blond child might inherit its mental characteristics from its brunette father. It might get a talent for painting from its mother, stubborness from is father, a round skull from its mother, a susceptibility to tuberculosis from its father. Each of its characteristics would fight the battle out for itself. The depth to which that characteristic or its opposing quality is rooted would be the determining factor. It is likely that one parent would win in certain cases and the other in certain cases."

"Is intellectuality inherited?" I wanted to know.

"An Englishman by the name of Francis Galton, a cousin of Darwin, has made some very interesting studies of honor men at Otford. He finds that to a surprising degree these honor men occur in the same families. Superior mental equipment is inherited.

"An American named Goddard, superintendent of an institution for the feeble-minded, has studied the family history of deficients. His studies and those of others prove that feeble-mindedness is hereditary. He developed the remarkable record of the progeny of a normal man who married a feeble-minded woman. In the five generations that followed there were some 400 children and 14.3 per cent of them were known to be feeble-minded. This same man married a second time, this time to a woman of normal intelligence. Out of an approximately similar number of progeny in a similar number of generations but one child was feeble-minded.

"One hears constantly reiterated the assertion that anything is possible to any man. It is the slogan that many educationists and prison reformers and settlement workers keep uttering. But there are very few biologists who believe that it is true. The biologist-student of human life believes that while environment, good or bad, and education, or the lack of it, can have much to do with determining the fate of a human individual, biological inheritance may have even more to do with it. When an individual is inherently incapable, is born with certain physical and mental limitations—and such individuals are being born all the time—no environment or education can carry him in the development of his capacity beyond some certain given point. On the other hand, to the individual blessed at birth with a large potential capacity and ability, given good environment, good education and good opportunity, the road to great accomplishment is open.

"More and more, psychologists are recognising, and are becoming able to determine with much accuracy, by ingeniously devised and carefully arranged mental tests, great variations in inherent mental ability. The schools are beginning to take advantage of this scientific knowledge. Not only are classes arranged for backward students, but the schools are beginning to arrange for special classes for the more forward, gifted pupils, and the colleges and universities are also recognizing the great importance of giving special attention to the gifted student. In a democracy, as in any other form of government—perhaps especially in a democracy—we need to insure the best development and to make best use of the best brains. Modern psychology, which is simply a special development of modern biology, is pointing out more and more opportunities for making practical use, for the benefit of the individual and the nation, of scientific knowledge of man.

"When it is asserted that men are born equal it should be remembered that reference is not made to their capacities but to their rights. The intellectual capacities of men are no more equal than their physical capacities, and it is obvious that some men are naturally stronger than others.

"The great advantage of general education is that it gives every intelligence an opportunity to assert itself. The individuals especially endowed come to the front. It is coming to be recognized that our schools have been conducted on a basis of special attention to the pupils of average intelligence; the specially gifted student has been held back to him. The new idea is that this outstanding individual should be given unusual attention, that he is the man in whom great possibilities lie. Those possibilities are in him, not because of his environment, for it has been the same as that of his fellows, but because of quality that came down to him from his ancestry. Heredity has been unduly discredited.

"The colleges are also beginning to take note of that individual who is the sport, the unusual offshoot of his heredity, who is the phenomenal individual, the genius. Genius is often a thing quite apart from intellectuality. If one has genius for music it is not based on his mental capacities. It is a thing apart. A genius for music runs in families. In the Bach family there were 20 musical geniuses. It is obvious that the genius should be given his opportunity.

"Biologists are all evolutionists—they all, with very rare exceptions, look on man as derived from lower animals—as, indeed, the highest of animals, something outside of or above nature. So they believe that man is subject, just as other animals are, to a certain control of natural law—that his evolution, gradual progress as a species, is caused or governed to a greater or lesser degree by the same natural factors that produce and direct the evolution of lower animals.

"To understand as much as they can of man's evolution they try to trace his existence in this world as far back as they can in geologic time. They hunt for human fossils and the results of human handiwork in the different geologic strata of the earth's surface, and when they find these relics they try to reconstruct the type of being early man was and the kind of life he led. Out of this man and his life, present man and his life have come, and clues may be found in the life of early man to present human capacity and behavior.

"More has been learned about prehistoric man since the beginning of this century than had been learned in all time before. We know now that man in one form or another has existed on this earth ever since the beginning of the present, or Pleistocene age. This beginning was certainly 500,000 years ago. It is probable that man dates from the age before, which would carry human existence back to perhaps a million years ago. In all that time he had been undergoing a slow, progressive evolution—very slow in the earlier hundreds of thousands of years—more rapid in the later ten thousands.

"There is no doubt that man of today is a very different creature—we may call him a much better creature—than man of 200,000 years ago, in his physical and mental make-up. But there is also little doubt that this biological evolution of man has advanced little, if any, since the days of earliest historic man, say 5000 or 6000 years ago, even, probably, since the later prehistoric, or so-called Neolithic days 10,000 to 20,000 years ago. That is, man as an individual had as good a biologic inheritance in the days of Greek and Roman greatness or in the earlier days of Egyptian and Mesopotamian and Cretan greatness, or even in the late Neolithic and early metal ages, as he has now. But now he is the inheritor, by social inheritance, of a vast accumulation of knowledge and of scientific method and technique, which gives him a great advantage over his ancestors of earlier days.

"Nevertheless, with all this advantage, he still has the same body and is still subject to the same natural limitations and is controlled, in considerable degree, by the same natural laws.

"There is undoubtedly much in individual inheritance and much in race inheritance. The race from which Americans spring has demonstrated ability by its accomplishments. It has within it capacity. It will hand that capacity down to its children. The continent of Africa has offered as favorable conditions as Europe for race development, but there is a great paucity of results. The inherent qualities of accomplishment were not in the people who inhabited Africa.

"Races remain the same as to inherent capacity through the thousands of years. It is probably true that Adam had within him the average capacities of the normal man of today. If he could have been lifted out of his environment as a child and set down at the beginning of the 20th century, he would have made as good man as you or I. He was of good race.

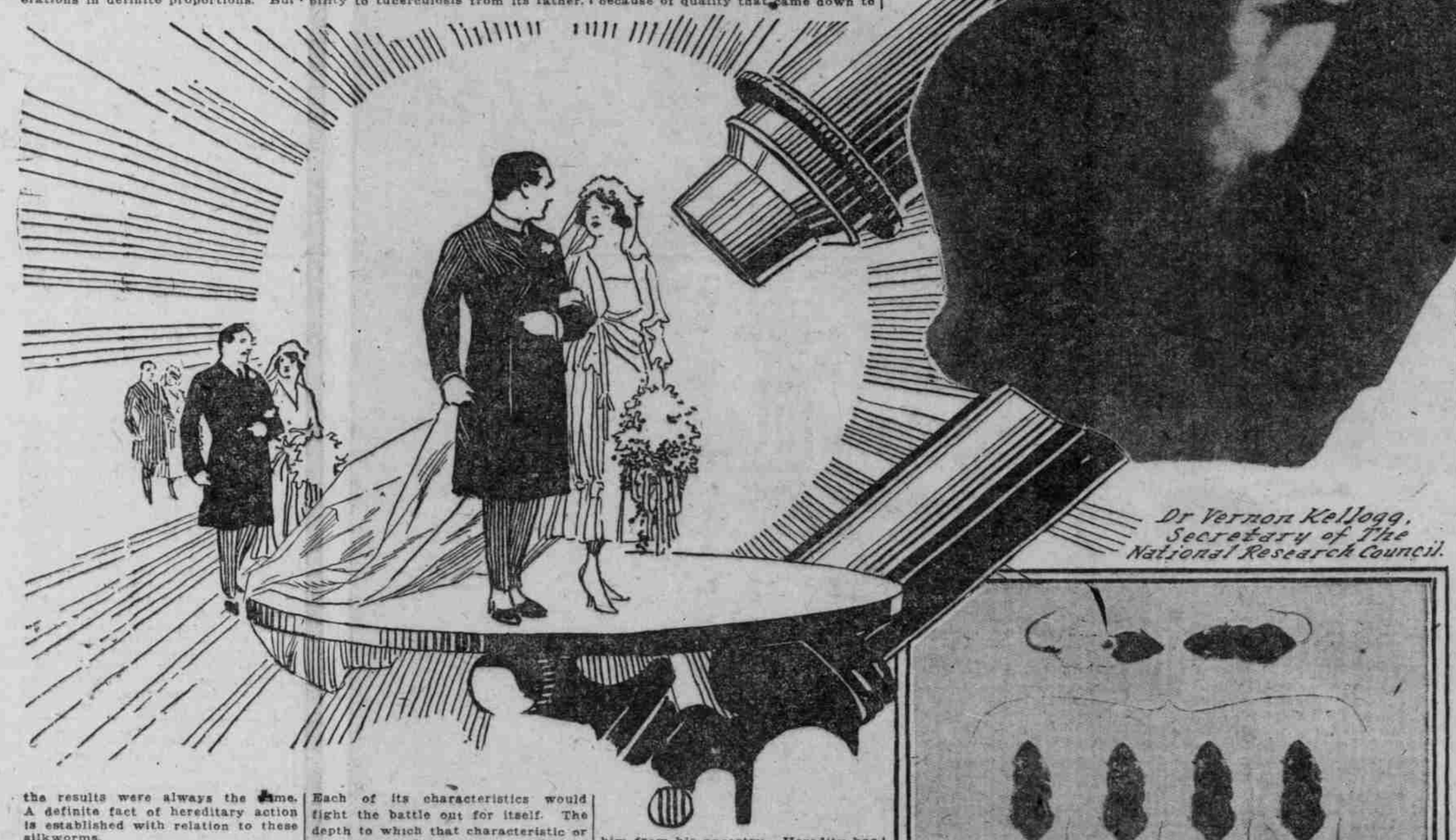
Most of the races on the earth today that have failed to develop have failed because of innate deficiencies. This is not true, however, of some of them. The Maori, of New Zealand, was still primitive when the Europeans went to that island. Some of these tribesmen have been given the opportunities of the children of British descent who inhabit the island. They seem to take an education as well, to become as efficient individuals as the children of the governing class of this island. They had probably failed to develop because of the isolation in which they lived.

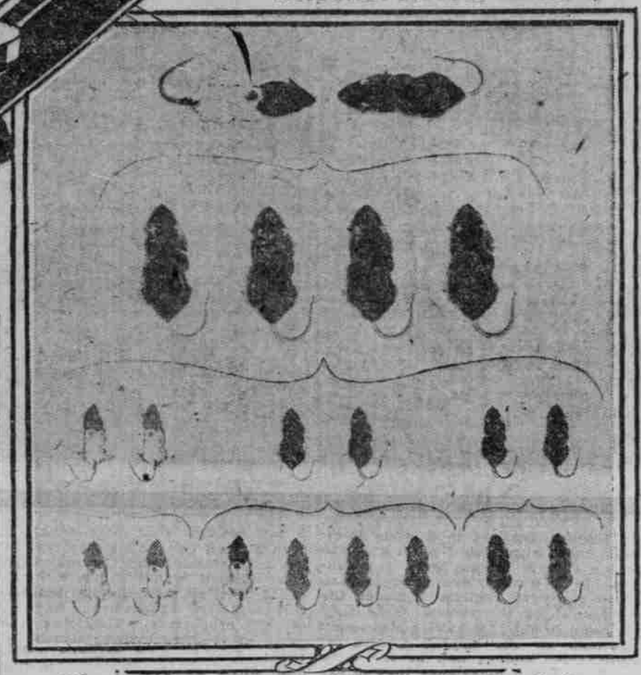
"There is much evidence that is ready for the gathering which will bear upon the results of various race amalgamations. The popular impression is that the Eurasian is a degenerate race. The Japanese have a peculiar race aloofness, and refuse to amalgamate with other peoples. The Chinese, on the contrary, intermarry freely and, according to insufficient evidence, the indication is that the resultant offspring is usually good. Hawaii is a world experiment station in the amalgamation of the races, and these crosses between the Chinese and the whites seem to result in individuals of good quality, and crosses between the Chinese and the Kanaka, native of the islands, is a particularly attractive and interesting type.

"Plant breeding has developed into an unquestioned science. Long staple cotton, for instance, resulted from the selection of the fittest plants and crossing them with other fit plants. A race of cotton was established that was the best quality in the world. The grower of this cotton is well aware of the fact that if he admits into his field a few stalks of cotton of inferior grade he will lower the quality of his entire field.

"The race of which the American comes has proved its superiority by the place it has won in the world, by dominance, leadership, accomplishment. Allowing inferior races to come into its domain, to be absorbed by it, produces exactly the result that is produced when scrub cotton is allowed to find a place in the field of long staple. The laws that control heredity in human beings are exactly the same as those which control heredity in cotton plants. The sooner this fact is realized the better it will be for the America of the future."

Dr Vernon Kellogg, Secretary of The National Research Council.





Mendel's Law As It Works Out In Four Generations of Mice.

JAZZ OR PRAYER HYMNS ARE PLAYED ON MUSICAL ROCKS

Strange Formation Puzzles Scientists and Draws Throngs of Curious Who Pay Small Sums to Discoverer to Hear Tunes Played.

MUSICAL rocks are not a common feature on estates, but there is a series of them that has been discovered at Marblehead, Mass. These consist of almost boulders and are laid consecutively, with small rocks placed in between to keep them in place.

In the olden days, when the redmen inhabited the forest, they spent their summers close to running water, and Marblehead was a favorite camping ground, the neck, across from the mainland, taking its name, Nanepashement, from the chief of the tribe, who formerly lived there. Indian relics which have been picked up all along the shore or found when plowing the land show that this was also a burial place.

Not far from the water on one of the many crooked streets that wind up hill and down along the rocky lands stands a small house. It is midway between the crest and bottom of a long hill, the road being so narrow that no two vehicles would be able to pass. It is near enough the shore to support the story which is told concerning these rocks, that they were originally placed here by the Indians, who must have chosen them through careful trying out of their different tones.

The grounds on which they now stand are owned by Alfred Frost, who went there several years ago to build up his health. It was not long after his coming that, while plowing the land, he noticed this pile of rocks, not all together, but divided by a little path. Curious to know what it all meant, he struck one with a stone and was astonished to find that it gave out a musical sound; interested, he tried one after another, and to his astonishment they sounded a whole cord. After experimenting with one thing after another, he found that a hammer produced the best results. The story of the musical rocks spread through the neighborhood, but even the oldest inhabitants were unable to tell anything about them. In fact, there were very few who had thought anything about it and scarcely one who knew that music could be produced from them.

Visitors from far and near came to visit the estate, so he put up a rustic shelter to make it more picturesque and for the sum of 25 cents he would play tunes that really were musical and in accord with what a violin and piano could produce. No one has been able to discover that they are made of any other material than just common stone.

Yet the fact remains that they can give out tunes, playing the popular jazz music of the day, or a psalm tune just as the player strikes them. It took him over a year to learn how to do this and he even took lessons on the piano that he might learn tunes more thoroughly, and now during the summer season especially he makes quite a handsome sum of money by displaying his rocks to the tourists. So popular have they become that some day as many as 50 to 60 visit the grounds, and he has to keep a careful watch lest some curious person carries off a little stone as a memento.

Mr. Frost claims that he is afraid to disturb any one of the rocks, lest by so doing discord is brought about. Be that as it may, it is certainly a unique find and one that scientists are studying to try to solve what seems to be an unknown problem in the habits and customs of the aborigines.

It is claimed by some that the situation has something to do with it, for being situated in a hollow, sound reverberates and is intensified. The other rocks which are in close proximity have been tried, but they give forth only a dull sound.

Robert M. Lovett Now Editor.

CHICAGO.—Professor Robert Morss Lovett, of the department of English at the University of Chicago, who was editor of The Dial in 1919, has recently become a member of the editorial staff of the New Republic, and will be absent from the university till the winter quarter of 1922. Professor Lovett, who is a member of the National Institute of Arts and Letters, is the joint author, with William Vaughn Moody, of "A History of English Literature," and has written several novels and a play. He has also been especially interested in the work of the poetry club at the university and has recently given to the university library the manuscript of a sonnet by William Vaughn Moody, who was once a member of the English department.