

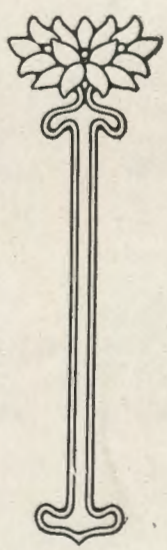
372

623
P-42

~~XLVII~~
~~302~~

Eugenics and Euthenics

J. H. KELLOGG, M. D.



Reprinted from
GOOD HEALTH MAGAZINE
BATTLE CREEK, MICH.
August, 1921

Eugenics and Euthenics

[A paper read before the Eugenics Club of Chicago, May 20, 1921, by Dr. J. H. Kellogg.]

EUGENICS is the science of race hygiene. Euthenics is the science of personal hygiene. The eugenists have heretofore insisted that there is little or no direct relation between the two. They have told us that race hygiene pertains only to the germ plasm, while personal hygiene concerns itself wholly with the soma, which is merely a vehicle for the immortal germ plasm which carries on from generation to generation the determiners of the racial stock, preserving intact their original characters irrespective of the vicissitudes and injuries to which the diseased and dying body which houses it may be subjected. For more than thirty years I have combated this doctrine as untenable in the light of practical human experience. Weismann claimed to have proved that acquired characters are not transmitted to offspring by heredity. He cut off the tails of many successive generations of rats and the last generation grew as long tails as the first. The great biologist overlooked the fact that the tailless state of his mutilated rats was not *acquired* by them, but was forced upon them. If the tails had disappeared by lack of use, as the eyes of the fish of the Mammoth Cave of Kentucky have done, the condition would have been acquired and would have been inheritable. I hope to be able in this paper to establish a definite and important relation between eugenics and euthenics by presenting established facts which prove that somatic characters resulting from changes in the environment of an organism, such as modifications of food or temperature and exposure to the action of bacteria and various poisons, may become permanent, through changes

in the germ plasm, as shown by their appearance in the progeny in accordance with Mendel's law.

The establishment of this fact puts upon each generation the responsibility not only of preserving intact the precious acquirements accumulated by the race during its long upward climb through countless ages of struggle with its environment, but of making contributions to further advancement through achievement and worth-while acquirement.

That the human race is tending downward, no thoughtful and informed person now disputes. For the last twenty-five years, the evidence that the human race is degenerating has steadily accumulated, until such a mass of pertinent facts has been gathered by scientific observers in various parts of the world that there is no longer room for doubt that we are going down hill at a rapid rate. Some years ago, Tredgold, the eminent English authority, referring to the evidence of race degeneration, remarked:

"It is impossible to avoid the conclusion that at present England contains an increasing number of people who are failing to adapt themselves to the exigencies of the times, who are not keeping pace with the increasing demands which civilization entails, and who are deficient in the capacity to carry on the progress of the nation and of the race. It seems probable, in view of the history of nations in the past, that much of the present social and industrial unrest and of the movements toward communism is also an expression of the same increasing physical and mental incapacity, and of a waning spirit of grit and independence.

"Life on this planet is so constituted

that it can only progress by the survival and propagation of the biologically fit and the elimination of the unfit. In the course of man's evolution a stage has been reached at which this process has been reversed, with the result that the race merely marks time, while successive nations ebb to and fro in a ceaseless rise and fall. I believe that this is but a phase, and that the time will certainly come when the antidote of eugenics will be applied, and man will continue his progress; and I have no hesitation in saying that the nation which first grasps and applies this principle will thereby secure such an advantage in increased efficiency that it will rapidly become the predominant power."

For long we have prided ourselves that in this twentieth century, which completes the sixth millennium of recognized historic time, we have attained the very summit of human intelligence. We overlook the wide difference between intelligence and knowledge. Knowledge is simply the accumulated products of intelligence. Intelligence is the power to discover or create knowledge. The world's great store of knowledge of which we boast is the accumulated wealth of the age-long experience of the human species. The seed thoughts of our greatest modern discoveries were planted long ago, perhaps ages in the past, and after germinating through immeasurable periods of human experience, have come to bloom and fruitage in these modern days. The really great discoveries were made so far back in the distant past that we cannot even guess by whom or how they were made. It required, indeed, a vastly greater amount of intelligence to make the first wagon, the first sailboat, the first algebraic formula, the first geometrical theorem, to formulate the first syllogism, than to make the greatest of our modern so-called discoveries.

Carlyle once said that the population of England were "mostly fools," and Galton declared that intelligence of the average

citizen was barely above the level of imbecility; while Davenport startled us some years ago by the assertion that mental defectives constitute one per cent of the population of the United States.

For many years the writer has been calling attention to these and other facts as evidences that the human race is degenerating; and that while modern intelligence, aided by our vast accumulations of knowledge, is able to accomplish now and then a brilliant achievement, the actual average intelligence of the race is sinking, just as vital stamina is lowering, notwithstanding the increase in average longevity.

The application of intelligence tests to tens of thousands of young men in the war examinations (1,600,000) shows not only that the statements of Carlyle, Galton and Davenport were true, but that the facts are even worse than they made them out to be. The psychologists describe three classes of congenital defectives,—idiots, imbeciles and morons. The idiot has less intelligence or sense than a child of three years; an imbecile has the mental equipment of a child of three to eight years; while an adult having only the intelligence of a child of eight to eleven years is a moron. Grown-ups having only the intelligence of a child of eleven to thirteen years might well fall into Carlyle's class of fools.

Now, what did the army tests demonstrate? A careful analysis of a hundred thousand of these tests shows that the average intelligence of the young men of the country between the ages of twenty-one and thirty-one years, including college students, teachers, bankers, lawyers—men of all classes, but excluding the obviously defective, the insane, imbeciles and idiots—is only equal to that of a normal child of thirteen years. It is evident that if the minority possessing superior intelligence were taken out of the group, the great mass left, probably more than three-fourths of the whole,

would fall much below the intelligence of a normal child of thirteen. In other words, Carlyle was literally right. Not only the population of England but that of the United States and of all other civilized countries is made up of "mostly fools."

Equally startling is the observation that 2.6 per cent of the entire mass show a degree of intelligence less than that of a normal child of ten years. In other words, one in thirty-nine of the men examined were found to be morons, or just a grade above imbecility.

When we take into consideration the fact that those obviously defective mentally were excluded before these tests were applied, it is evident that the proportion of mental defectives in the United States—that is, those whose minds are definitely below the level of ordinary intelligence—is without doubt considerably greater than three per cent, which shows the situation as regards our national intelligence to be three times as bad as Dr. Davenport announced some years ago.

It would also appear from the army examinations that no more than ten per cent of the population may be regarded as capable of profiting fully by a college education. Of these not more than one-fifth actually attend college.

The evidence is certainly too plain for any intelligent person longer to doubt that the trend of civilization is downward. Brain and mind are deteriorating, as well as other bodily structures and functions. If we continue to fail at the present rate, by the end of the century we shall all be lunatics or idiots; and so it may be fortunate if Professor Cattell's prediction comes true, that, through the rapidly-lowering birth-rate, by the year 2000 not a child will be born.

The military examinations made of our young men under the Selective Draft Act showed that one-third were unfit for any sort of military service, and only one-half

were capable of being trained for full military duty.

So long ago as 1904, according to Max Gruber, President of the Royal Hygienic Institute of Munich, 40 per cent of the young men of Germany were unfit for military service, and a large per cent of German young women were unable to nurse their children. Life expectancy for the new-born boy in Germany was then but 42 years, and for the girl, 46 years.

In every civilized land, it is remarked that very few representatives of old city families are to be found. In Germany, all but 5 per cent of noted families living five or six hundred years ago are now extinct. In England, only three of the ducal families of the time of Charles II have living representatives. The few which remain owe their existence to the infusion of new blood from the rural districts. City life is fatal to the longevity of families as well as of individuals.

We are obliged to admit that notwithstanding the increase in the average length of human life, the real stamina of the race is depreciating. On the whole, this downward tendency seems to have been advancing almost steadily from the palmy days of Greece down to the present time. It is not to be forgotten that within the space of two generations, the small city of Athens produced more men of supreme genius than have been produced by all the rest of the world in the two thousand years that have since elapsed.

When we look around for the causes of this degenerative tendency, we are bound to recognize the fact that whatever they are, they must be cumulative. Race life, race character—all racial attributes—reside in the germ plasm. It must be, then, to heredity that we are to look for the means by which race degeneracy is operative.

One school of eugenicists, including perhaps the majority of those who are considered authorities in this science, have maintained that acquired characters can-

not be inherited. The question at once arises, If this is true, what influence can bad habits have on race degeneracy, or good habits on race betterment? The question also arises, When defective forms appear, what is their origin? According to DeVries, they are due to mutation, but mutation is only another word for chance. The mutation theory really explains nothing, unless it be held that the new forms which appear are an effect without a cause, a position scarcely tenable in these enlightened times.

The race degeneration which is evidently taking place in every civilized land must be the result of causes, the effects of which become cumulative through transmission from parents to offspring. Galton elaborated some of the laws of inheritance, and showed that the chance that the son of an eminent man will show great ability is 500 times as great as that the son of an average man will develop such prominence. Galton estimated that one person in every 248 could be certified to be mentally defective. This proportion, as Tredgold has recently pointed out, has greatly increased since 1906, together with a larger class whose capacity for mental development is sub-normal. These people represent, as Tredgold remarks, "a definite retrogression." Evidently the germ plasm is being impaired by some cause or causes *and the inferiority thus acquired is transmitted*. Tredgold says frankly that there are "many facts not to be explained otherwise."

The late Professor Hyatt of Boston University, one of the leading biologists of his time, was an adherent of the Lamarck doctrine, which held to the inheritance of acquired characters. Hyatt maintained that the inheritance of acquired characters was shown by his results upon fossil shells, concerning a certain feature of which Mayer remarks:

"It is hard to escape the conclusion that this is actually an acquired character which becomes hereditary, and finally ap-

pears at a stage earlier than that in which it first developed. Indeed, it is one of the classic instances of an acquired character, and one of the best established cases of this sort in the whole field of zoology."

Hyatt, indeed, believed that degeneration is an essential part of the evolutionary process, "retrogression ending in extinction," always following a period of progressive development. This philosophy leaves no possible room to escape physical degeneracy and race extinction. The race of man must become extinct, as have already most of the races of higher vertebrates who were the contemporaries of man in the Cave-dwelling period. The only escape from this dismal end must be found in a recognition of the danger and a race-wide struggle against race enemies. Through his intelligence man has subdued many of the great forces of Nature, tamed and harnessed them, and made them useful servants. Thus he is able to escape the usual operation of physical law, to defy gravitation, to soar in the heavens like a bird, to dodge the terrors of the thunderbolt, and to harness the lightning and make it pull trains and propel ships. Likewise, by an equally intimate study of the laws of eugenics and eugenics, and by a whole-hearted effort to conform himself to the biologic laws which govern his being, man may escape the destructive influences which have exterminated other races of animals, and which with equal certainty will destroy man unless he intelligently and persistently combats the exterminating cosmic forces to the operation of which every living creature is exposed.

Sir Alfred Wallace maintained that the race has not improved either mentally or morally since old Egyptian times. He insisted, in fact, that considering our possibilities and our opportunities, we are worse morally than were the Egyptians or any other people who have lived before us.

Said the late Professor Charles H. Ward in a notable paper:

"That a retrograde evolution or degeneration of these organs (the teeth) is at work in man is apparent to the student of physical anthropology. To him each upward stride of civilization, of ethnic superiority, is associated with indubitable evidences of structural inferiority; so that the evolutionist's prophetic vision of the 'coming man' as a bespectacled, bald-headed, and edentulous individual of infantile proportions but preternatural intelligence, appeals to him as a not impossible result of modern life."

Our native stock is certainly running out. Professor Wilcox showed some years ago that at the beginning of the century there were in this country practically one child under five years of age for every woman between the ages of fifteen and forty-four years, the child-bearing period. Since the beginning of the century, however, the decrease of children has been so great that by the end of the century there will be no children if the decrease continues at the same rate; and a most ominous fact is that the decrease in the birth-rate has been most marked in the native population. For example, in 1910, the native stock had a birth-rate of 14.9 in the State of Massachusetts, whereas, the foreign born birth-rate was 49.1, three and a half times as great. During the same year the native death-rate was 16.3 per thousand, while the foreign death-rate was only 15.4. In brief, the native stock is dying out, since the birth-rate is less than the death-rate, whereas the increase among the foreign-born population is very marked. The number of children per family was for the native-born population 2.7 per cent, whereas for the families of foreign-born persons the number of children was 4.1 per cent. Statistical authorities tell us that there must be at least four children to each family to prevent a decrease of

population,—two to replace the parents and two more to provide for deaths, infertility and failure to marry.

A professor of Economics, writing some years ago in *The Popular Science Monthly*, showed that the native-born population of the United States in the year 1800 was doubling itself by natural increase every twenty-five years. A continuation of this ratio would have made the native-born population in 1900 about 100,000,000. The same rate of increase continued would have made a population of 800,000,000 by the year 2000 A. D., and by the year 2100 A. D. the native-born population of the United States, by natural increase, would have reached the number of 12,800,000,000. However, the native-born population in 1900, instead of being 100,000,000, was only 41,000,000. An examination of the census figures from decade to decade show a steady decline in the rate of increase of the native population until, during the last decade of the century, the native population of the United States increased only 18 per cent.

That the germ plasm may be so influenced by environment that acquired characters are transmitted to progeny, has been experimentally shown quite convincingly by numerous observers during the last few years. McDougal, for example, claims to have produced mutations, that is, created new species by injecting chemicals into the ovary of a plant. Tower, using heat as a stimulus, produced a beetle of a very light color. He proved that this character had become fixed by crossing with a beetle of normal color. Starvation of insects in the larval stage has been shown to produce dwarfs in later generations.

Kammerer, of Vienna, has conducted in the Laboratory of the Institute for Experimental Evolution, a great number of experiments for the purpose of determining the possibility of the transmission of acquired characters, and with some most remarkable results. Frogs have been produced which retain tadpole characteristics and transmit

them to their progeny in a manner which would be expected from Mendel's law.

Dr. W. E. Agar produced very marked changes in the structure of the water-flea by special feeding. The change induced, appeared in the young even though the animals were placed in normal conditions before the eggs were laid. Dr. Agar believed the changes observed to be due to modifications of the products of metabolism induced by the special feeding. The conclusion reached by this investigator was that whenever the environment acts simultaneously on body and germ plasm, corresponding alterations occur in both the body and the germ plasm.

By exposure of the pupæ of moths and butterflies to abnormally high and low temperatures, Fischer and others have produced changes in color in the fully developed insects which persisted in the offspring. A dark color was induced by a low temperature (47° F.). Weismann admitted the significance of these observations and allowed that long-continued cold may result in producing dark colored races as seen in the natives of Arctic regions.

Guyer and Smith, of the University of Wisconsin, have shown that a special serum prepared from the crystalline lens of the eyes of rabbits, when injected into mother rabbits, gives rise to their young having defective eyes. Among the defects were abnormally small eyes, cataracts and other very pronounced abnormalities. These defects were reproduced in the offspring through six generations, becoming more and more pronounced in successive generations.

These experiments clearly show that conditions of environment which impair the body structure of an animal may also damage the germ plasm. It is entirely reasonable to believe that some of these injurious influences may act in so subtle and gradual a manner that their effects may not become apparent in one or two generations, although their influence may be none the less definite and certain in finally undermining racial stamina. It seems wholly reasonable to be-

lieve that the long-continued operation of such causes may be the explanation of the great physical and mental depreciation found in certain tribes of savages who have reached a state of degradation but little above the level of the beasts of the forest. And the same explanation may apply to the pronounced deterioration noted in certain centers of civilization, such, for example, as the Manchester district of England and the east part of London, where the average development, both mental and physical, is very far below the general average of the English people.

The hereditary effects of alcohol have long been recognized. Bunge has shown that the daughters of inebriate fathers, if not sterile, are unable to nurse their children.

Bezzola found by a study of the monthly birth-rate in Switzerland that the origin of a large preponderance of idiocy could be definitely traced to the influence of the Easter festival and the wine-making period, at which times the use of alcoholic liquors by both men and women is greatly increased.

The biologic facts brought out by these and other experiments show clearly the possible influence of various poisons to which the human germ plasm is exposed as the result of disease and erroneous habits of life. Certain metallic poisons, particularly lead and mercury, are known to damage the germ plasm in such a way as to impress their effects upon the progeny, giving rise to stunted and wizened children with such certainty that in some countries laws have been enacted forbidding women to engage in occupations involving contact with lead and mercury. The influence of the poisons produced by the parasites of malarial fever and syphilis upon offspring is well known. Congenital weaknesses of many sorts, deformities, and especially susceptibility to tuberculosis and other maladies, are among the well-determined effects of hereditary syphilis. Some of the effects are even seen in the children of those who

are believed to have been cured of syphilitic disease, for a cure consists in the extinction of the consuming flame, and does not accomplish the full repair of the damaged structure. The extent to which this evil may influence the race life is indicated by the fact that the government statistics of Prussia for April 30, 1900, showed that at that time 1.4 per cent of all adult men in Berlin were under medical treatment for venereal disease.

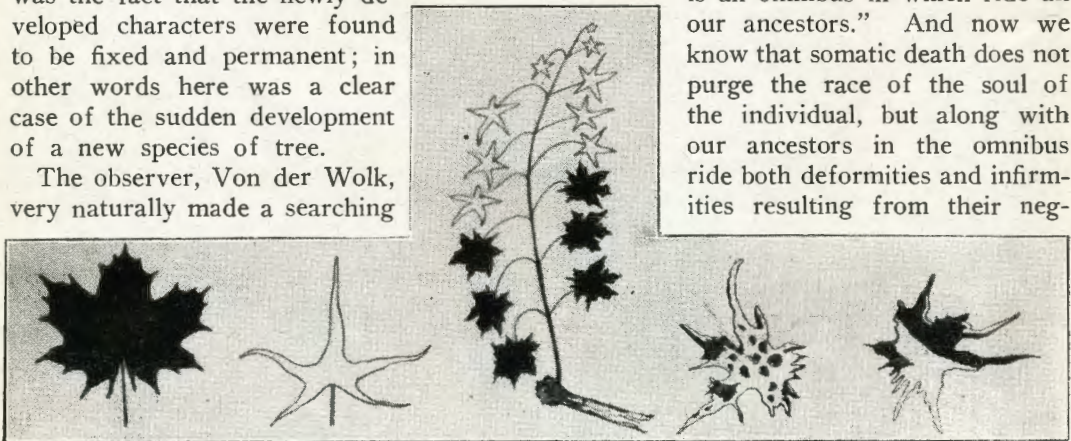
Recent remarkable observations by Van der Wolk have finally demonstrated that characters induced by bacterial infection may become fixed and obey the Mendelian laws of heredity. A maple tree which had been pruned showed the appearance of rot at the point injured by the pruning shears. Near these points the tree sent out leaves which differed both in form and color from the normal leaves. The lobes of the new leaves were pointed and were white instead of green in color. Some of the new shoots bore blossoms, and it was found that the flowers were also different and were mono-sexual instead of bi-sexual, a most remarkable change. Here was certainly a most pronounced case of mutation, a development of characteristics quite sufficient to establish a new species and without any indication of gradual transition. But the most remarkable thing about this mutation was the fact that the newly developed characters were found to be fixed and permanent; in other words here was a clear case of the sudden development of a new species of tree.

The observer, Von der Wolk, very naturally made a searching

inquiry to discover, if possible, the cause of this biologic miracle. A bacteriological study of the points of injury which appeared to be affected by rot resulted in the isolation of a special microorganism, cultures of which were used in the inoculation of green maple boughs. The inoculated branches straightway put forth white leaves.

Continuing his experiments, Von der Wolk planted maple seeds in soil which had been inoculated with the new organism, and with the result that the plants developed from these seeds also showed marked alterations in character. Crossing of the white-leaved plants with green plants produced white-leaved plants only; but if the white-leaved plants were disinfected with calcium oxalate before the crossing, the hybrids bore spotted leaves.

In view of these most interesting observations, it may now be definitely stated in the words of the eminent biologist of Vienna, Prof. Paul Kammerer, that "*mutations are acquired characters*;" and we may affirm with confidence that this long-debated question of inheritance is finally settled. What we are today is simply the summary of the experience, the behavior and the *work* of our ancestors. Oliver Wendell Holmes declared that "each of us is an omnibus in which ride all our ancestors." And now we know that somatic death does not purge the race of the soul of the individual, but along with our ancestors in the omnibus ride both deformities and infirmities resulting from their neg-



AN ORDINARY MAPLE LEAF AND ON THE RIGHT ALTERED FORM OF WHITE MAPLE LEAF

GREEN TWIG WHOSE TIP HAS BEEN ARTIFICIALLY INFECTED

HYBRID PRODUCED BY CROSSING ORDINARY MAPLE LEAF WITH DISINFECTED WHITE MAPLE

lects, abuses and dissipations, and the acquirements resulting from toil and struggle toward achievement in the world's arena; and we see that *euthenics*, the science of individual hygiene, takes its place beside eugenics, race hygiene, as one of the twin forces by which that hydra-headed monster, race degeneracy, must be combated and slain. Eugenics alone cannot save us.

Nature is a good bookkeeper. She takes note of every deviation from the path of physical rectitude. Her fiat, "Whatsoever a man soweth that shall he also reap," is inexorable. The injuries we inflict upon our bodies by unbiologic habits are registered in indelible impressions upon the germ plasm, wherein is recorded the life histories of our ancestors of which we ourselves are the visible expression. In each of our daily acts we are putting down upon the record something which will influence, for better or worse, the lives and characters of those who come after us. In the light of this great biologic fact, it is truly a solemn thing to live. The men and women of past generations are brought to judgment in the present generation, and the generation now living will be judged by each of these that come after it. The great judgment day at which every man must give account for the deeds done in his body is not a theological dogma, the realization of which as regards time and place is wrapped in more or less obscurity and uncertainty, but is actually with us here and now, an unescapable actuality.

The only hope for the human race, so far as I can see, lies in the development of a new conscience, a broader religion, a code of ethics which will place the canons of biological law alongside those of the Decalogue and make man's responsibility to the human race—to those who come after him—the ruling influence of his conduct.

But whether the results of bad habits are directly transmitted or not, it cannot be denied that individual hygiene or *euthenics*

is essential to race betterment. All the advantages of the most desirable heritage may be lost as the result of evil environment. Heredity concerns only potential capacity. Environment controls development. A boy born into the world with the capacity to become a giant may be dwarfed and wizened by wrong feeding. The blighting influence of syphilis, of alcohol, tobacco, and other drugs, gluttony, sensuality and other vices, cannot be questioned, and these destructive influences are multiplying. The daily poison dose, through drug habits, has steadily increased from year to year until now the average person living in the United States, including women and children as well as men, swallows daily nearly 300 grains of poison, alcohol, nicotine, caffeine, and opium. This alone would be enough to produce profound symptoms of degeneration, if no other causes were in operation. We have indeed departed far from the narrow road. We have long been cultivating disease instead of health and in a great number of ways.

Thousands of races of animals have degenerated and disappeared from the earth because of changes in their environment which made the conditions of life to which they were subjected inimicable to them. Man, the most complicated of all animal organisms, and hence the most likely to be injured by unfavorable conditions, finds himself at the present time subjected to an environment more dissimilar from that to which he is naturally adapted than that of almost any other race of animals. Naturally an out-of-door dweller, freely exposed to the sunlight and bathed in pure air, man has become a house dweller, secluding himself from the sun and air, smothering himself with clothing and spending the greater part of his life as a prisoner within air-tight walls, exposed to a vitiated atmosphere and the disease-producing germs which thrive under such conditions. Naturally a low-protein feeder, like the chimpanzee, the orang and other primates, he has in recent times adopted a high-protein diet, the diet

of the dog and the lion, whose digestive machinery is adapted to such a dietary, but which is hostile and damaging to the human constitution.

Primitive man, living in a tropical climate, required no more clothing than is provided him by Nature. Civilized man has invented clothes, but wears them not simply to protect himself from extremes of temperature or other injury, or to satisfy other bodily needs, but to meet the demands of fashion. Naturally fleet of foot, agile and muscular, supple and enduring, by sedentary habits civilized man has become puny, rheumatic, gouty, short of wind, hobbled by flat feet, and is beginning to lose his toes. Lack of exercise has diminished his chest capacity until he has lost two ribs and is losing others, and has become an easy prey to consumption, pneumonia and other lung diseases. Man has acquired hunting habits, but has no natural capacity for either hunting or killing; so when he goes in quest of a quarry, he must take along a dog to find it and a gun with which to kill it. Through neglect to use his teeth he has begun to lose them. His third molar is practically gone and other teeth are often lacking; and all are subject to early decay—one of the most certain evidences of constitutional weakness and race degeneracy.

At the present moment degeneracy is rampant in the earth. Every day this upas tree is planting its roots deeper and spreading wider its death-dropping branches; but, though at the present time the prospect may seem dark and the future outlook forbidding, the new science of eugenics and the old but sadly neglected science of euthenics, rise like a light-tower in the darkness and cast a flood of light and hope over the coming years. Following this beacon, the outlook is most optimistic. Eugenics and euthenics, applied with liberal intelligence, will save the race from the destruction which race degeneracy threatens. Other races of the animal kingdom are helpless to combat the influences which produce

environmental changes inimicable to their existence; hence every one, sooner or later, must succumb to the destructive action of these cosmic forces. The same fate must necessarily await the human race as a whole, unless man, through his intelligence, finds some way to avert the disaster. He can do this if he will. Unfortunately he has to a large extent neglected to recognize the necessity for preserving, so far as possible, the essential conditions of his primitive life. He has allowed himself to drift. He has formed habits by chance. Instead of laboring to preserve amid the conditions of civilized life the essentials of his primeval environment, he has done the very opposite. He has allowed his fancy and his impulses to lead him into by and forbidden paths and has undertaken to compel his body to adjust itself to impossible conditions; and the result is, instead of lessening he has intensified the evil effects of environment. The same forces which have destroyed other creatures, other genuses and species, and which are preying upon man as a member of the animal kingdom, instead of being mitigated and neutralized by the intelligence of man, have actually been increased and exaggerated. Man has thus forced upon his body conditions which are so far removed from his biologic and physiologic requirements that, at the present time, he is actually accentuating by his daily habits of life the influence of those destructive forces which have wiped out generation after generation of living beings.

But we may reverse the situation by the intelligent application of eugenics and euthenics. By a careful study of our biologic needs, our physiologic requirements, we may reverse the process, and compel the cosmic forces which are dragging us down to lift us up, so that each generation may be superior to that which preceded it.

That there will sometime be a new human race, a race far superior to the present, is believed by many scientists. It is within the power of man so to modify his environ-

ment and so to control the evolutionary forces which are working upon him as to eliminate the degenerative, destructive tendencies and to promote, encourage and intensify the forces making for race betterment, and thus to improve desirable qualities and eliminate defects and undesirable characteristics, and so in time produce a race of human thoroughbreds which will be as much superior to the average existing man as is the thoroughbred horse to the average horse of the farm.

The coming man will rank far above the man of to-day in intelligence, in stamina, in endurance, in length of days, size of body, bigness of brain and in all characteristics which make up human excellence. He will be, in every way, a bigger man. He will be a real aristocrat. In his veins will course, not blue blood, but the red blood of abounding health and vitality, polluted with no disease or hereditary taint, equipped with alexins and antitoxins capable of resisting every infectious disease, and teeming with life and vitality.

The intelligence of the world should be set to work to create new agencies and to multiply existing agencies for the betterment of the race. A biologic survey should be made of every civilized community and of savage communities as well, for purposes of comparison. The laws of eugenics and eugenics should be taught in every school and preached from every pulpit. Every teacher, every leader of human thought, every publisher, all professions, all serious-minded men and women, should join in making known to every human being in every corner of the globe the fact that the human race is dying, and in seeking to discover and apply the remedies necessary for salvation from this dismal fate.

Movements of all sorts which seek to promote the physical welfare must be encouraged and unified. Eugenics and eugenics should be magnified before the

people until their paramount importance is appreciated and legislatures become willing to appropriate funds as liberally for these essential means of race betterment as they are now doing for the improvement of farm crops and animals through similar means. Prizes should be offered for the finest families and the best health and endurance records.

We must provide compensations for the departure from normal conditions of life which civilization necessarily involves. We need not return to savagery to be healthy, but we must see that the air we breathe is as clean as that which the savage breathes, that the food we eat is as wholesome and pure as the water we drink. We must encourage out-of-door living and sleeping. We must provide in every city out-of-door gymnasiums with swimming pools for boys and girls. We must inculcate the principles of biologic living, and respect for the body and appreciation of the value of physical fitness. We must give our pale skins more contact with the sun and air and we must keep the inside of our bodies as clean as the outside. We must cultivate clean blood. Society must establish laws and sanctions which will check the operation of heredity in the multiplication of the unfit. Eugenics and eugenics must become dominant matters of study and concern. Thus and thus only may we hope to check the mad rush of the race down the hill of decadence and slowly climb back and up toward the proud eminence where man as the handiwork of God and the masterpiece of creation, by the aid of his unapproached intelligence and through implicit obedience to biologic laws, may defy the ravages of time and the perturbations of cosmic forces, and endure forever, indestructible and triumphant among the millions of animal forms now living and their predecessors buried in the crust of the earth.