PHILOSOPHICAL ASSESSMENT OF THE PRACTICABILITY OF NEW GENETICS

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Introduction

The study of human heredity and variation occupies a central position in genetics. Much of this interest stems from a basic desire to know who human are and why they are as they are, as well as why they behave the way they do. At a more practicable level, an understanding of human hereditary is of critical importance in the prediction, diagnosis, and the treatment of diseases that have a genetic component. Thus, the quest to determine the genetic basis of human health has given rise to the field of medical genetics.

Again, owning to the fact that medicine in general has given focus and purpose to human genetics, so the terms medical genetics and human genetics are often considered synonymous. But then, the question has always been if genetics so to speak can actually improve the human genes or will such an action not be a manipulation of human life? These and more are the basic discussions that will be delved into in this write-up.

Brief History

Historically speaking, it was the Ionian philosopher Pythagoras who speculated around 500 BC that human life begins with a blend of male and female fluids, originating in body parts. Aristotle later postulated that the fluids are purified blood and that blood, therefore, is the element of heredity. That this later concept persisted in the Western world is indicated by such common phrases as blue blood, blood-will-tell, blood relative, bad blood, and royal blood. About 1651, William Harvey disproved the Greek concept; his discovery that deer embryos have the appearance of a tiny ball during early developmental stages and resemble a deer only later in development led him to conclude that the origin of the tiny ball was a small egg. Before the end of the 17th century, it had been suggested that the female structures called ovaries are the source of eggs and that sperm might carry the hereditary material of the male.

Early in the 19th century, Jean-Baptist Lamarck suggested that acquired characteristics are inherited. Around 1865 Gregor Mendel reported his discoveries on inheritance in garden peas. A few years later, the DNA component of genes was isolated from pus cells, and it was discovered that salmon sperm also contain considerable amounts of DNA. He also reasoned that they reproductive pea of plants might contain discreet factors each of which specified a particular trait. He also observed that the factor must be physical and material, because they passed from parents to the offspring in a mathematically orderly way.

Definition of Major Terms

- **Genetics:** it is derived from an Ancient Greek word *genetikos*, genitive and from genesis which means origin. This can be defined as the process of trait inheritance from parents to offspring. And this inheritance includes the molecular structure and function of genes behavior in the context of a cell or organism.
- **New Genetics:** this is the new discovery on the further ways genes work in the human body or plants or animals. It involves manipulation of certain characters in the mechanism of gene. This manipulation technique involves cloning, in vitro fertilization and human embryonic stem cell.
- **Gene:** This is the basic unit of heredity found in the cells of all living organisms, from bacteria to humans. Genes determine the physical characteristics that an organism inherits, such as the shape of a tree's leaf, the markings on a cat's fur, and the colour of a human hair. Genes are found in the long willed chains called chromosomes; one may liken it to a thread.
- **Chromosomes:** This is the microscopic structure within cells that carries the molecule deoxyribonucleic acid (DNA)—the hereditary material that influences the development and characteristics of each organism.
- **Human genetics**: This is the study of inheritance of characteristics by children from parents. Inheritance in humans does not differ in any fundamental way from that in other organisms. The understanding of human genetics builds on a foundation of information obtained from studying other organisms. Until the 1980s, genetic researchers focused their work on the fundamental genetic processes in simpler organisms, such as bacteria, plants, and fruit flies. Today an expanded array of tools available for the direct study of human genetics attracts scientists from around the world to collaborate to identify and study every human gene.

How Genes Work and Its Application

It is good to note that the human individual arises through the union of two cells, an egg from the mother and a sperm from the father. Human egg cells are barely visible to the naked eye. They are shed, usually one at a time, from the ovary into the oviducts (fallopian tubes), through which they pass into the uterus. Fertilization then, is the penetration of an egg by sperm, occurs in the oviducts, this of course is the main event of sexual reproduction and determines the genetic constitution of the new individual.

- **Fraternal Twins**: Usually a fertile human female produces a single egg about once a month. Should fertilization occur (i.e. a zygote is formed), growth of the individual child normally proceeds after the fertilized egg has become implanted in the wall of the uterus (womb). In the unusual circumstance that two unfertilized eggs are simultaneously by a different sperm cell at about the same time, become implanted and grow, to result in the birth of twins.

Twins formed from separate eggs and different sperm cells can be of the same or of either sex. No matter what their sex, they are designated as fraternal twins. This terminology is used to emphasize that fraternal twins are genetically no more alike than are siblings born years apart. Basically they differ from ordinary siblings only in having grown side by side in the womb in having been born at approximately the same time.

Genetics is the study of hereditary. Hereditary is a biological process where a parent passes certain genes onto their children or offspring. Good to note that every child inherits

genes from both of their biological parents and these genes in turn express specific traits. But then, some of these traits may be physical, for instance, the colour of eye or skin, the hair, etc. While on the other way round, some genes may also risk carrying certain diseases and disorders that can possibly be transferred from parents to their offspring.

The genes themselves it must be noted lie within the chromosomes. Research has also shown that humans have 23 pairs of these small tread-like structures in the nucleus of their cells. While 23 or half of the total 46 comes from the mother, the other 23 comes from the father. Furthermore, some chromosomes often carry thousands of important genes while some may carry only few. The chromosomes themselves as well as the genes are made up of the chemical substance called DNA (Deoxyribonucleic Acid) and they are very long thin strands of DNA, coiled up tightly.

On the other round, genes work as a guide, pattern or language for the production of many thousands of molecules of ribonucleic acid (RNA). The DNA controls the manufacture of molecules and also serves as a template for its own reduplication. It is the recipe for the regulation of all cells' life. Scientists believe they can produce living organism by producing DNA artificially in a laboratory. The knowledge of the human genome has led to the "Genome"- The use of human genes, proteins and cells, as medicine instead of chemicals, which have been in use.

But then, this workability of genes has a side effect, because the application of genome may lead to genetic calamity or genetic time bomb and the production of readily man-made microbes. A very good example is the 1980 Soviet Union incurable strains of Block of Death (Bubonic Plague) that were resistant to drugs.

- **Medicine:** In this regard, genetic techniques are used in medicine to diagnose and treat inherited human disorders. Knowledge of a family history of cancer or tuberculosis may indicate a hereditary tendency to develop these afflictions. Cells from embryonic membranes reveal certain genetic abnormalities, including enzyme deficiencies that may be present in newborn babies, and thus permit early treatment. Although in most cases, many countries require a blood test of newborn babies to determine the presence of an enzyme necessary to convert an amino acid, phenylalanine, into simpler products. While on the other way round, *Phenylketonuria*, which results from lack of the enzyme, causes permanent brain damage if not treated soon after birth. The presence of approximately 100 different types of human genetic diseases can be detected in embryos as young as 12 weeks; the procedure of carrying this, called amniocentesis, involves the removal and testing of a small amount of fluid from around the embryo.
- **Agriculture and Animal Husbandry**: On the aspect of agriculture and animal husbandry, the application of genetic techniques is to improve plants and animals. Plant geneticists produce new species by special treatment; *e.g.*, a hybrid grain has been produced from wheat and rye, and plants resistant to destruction by insect pests have been developed.

Plant breeders use the techniques of budding and grafting to maintain desirable gene combinations originally obtained from crossbreeding. The use of the chemical compound colchicines, which causes chromosomes to double in number, has resulted in many new varieties of fruits, vegetables, and flowers. Animal breeders use artificial insemination to propagate the genes of prize bulls. Prize cows can transmit their genes to hundreds of

offspring by hormone treatment, which stimulates the release of many eggs that are collected, fertilized, and transplanted to foster mothers.

- **Industry**: In this respect, various industries employ geneticists; for instance, breweries, may implore geneticists to obtain strains of yeast that produce large quantities of alcohol. The pharmaceutical industry has developed strains of molds, bacteria, and other microorganisms high in antibiotic yield.

Kinds of Genetic Diseases

There are three categories of genetic diseases, namely;

- **Gross Chromosome abnormalities**

These are abnormalities or disorders because of many or too few chromosomes in the cells of patients or part of their chromosomes are misplaced

- **Polygenic Disorders**

These are cases of patients whose chromosomes look normal but really carry many defective genes and the environment contributes in these disabilities such as congenital heart disease, spiral bifida, clubfeet, schizophrenia etc.

- **Single Gene Disease/Defects**

Most of the genetic diseases located here include sickle cell anaemia, cholera, galaetosomia etc.

New Genetics: How Far?

- **Genetically Modified Monkeys created with cut-and paste DNA**

Researchers have created genetically modified monkeys with a revolutionary new procedure that enables scientists to cut and paste DNA in living organisms. History has it the macaques are the first primates to have their genetic makeup altered with the powerful technology which many scientists believed will lead to a new era of genetic medicine. Some researchers applauded the feat saying that it would help them to recreate devastating human diseases in monkeys, such as Alzheimer's and Parkinson's. The ability of such alteration in DNA with such precision has being investigated by some as a way to make people resistant to HIV.

Above all, this breakthrough itself is controversial, as some groups who are opposed to animal testing, warned that it could drive a rise in the use of monkeys in research. In response to such breakthrough, a critic noted that 'genetic engineering gave researchers almost limitless power to create sick animals.'

This work or research was carried out in a science laboratory in China, in Nanjing Medical University, where scientists said they had used a genome editing procedure, called Crispr/Cas9, to manipulate two genes in fertilised monkey eggs before transferring them to surrogate mothers. The team of researchers reported the delivery of twin female long-tailed macaques, called Ningning and Mingming, they also recorded five surrogate miscarried and four more pregnancies that are ongoing.

This Crispr procedure has been welcomed by geneticists in labs around the world because of its potential. This is base on the ground that it allows scientists to remove faulty genes from cells, or replace them with healthy ones.

These Chinese team lead by the Chinese Scientist Jiahao Sha, noted that their work demonstrates how Crispr could be used to create monkeys that carry genetic faults that lead to diseases in humans. Again, the same can as well be done to small pieces of human organs grown in the lab and used to test drugs, or to monitor the progress of serious diseases. Thus on a general note, geneticists all over the world welcomed this research, viewing it as a good means of improving genes.

Genetic Manipulation

- **Asexual Reproduction:** This has already been successfully achieved in lower animals and to so extent in man. One method is by nuclear transplantation, or cloning. In this case, the nucleus of an unfertilized ovum will be destroyed by ultraviolet radiation and then replaced by the nucleus of a cell taken from the body of some other person. The ovum then will have full set of chromosomes and so will eventually develop into the identical twin person who supplied the nucleus for transplant. In this way, it will be possible to make exact copies or replicas of any human being. In this process, there is no sexual activity involved.
- **Artificial Insemination**: This is another possible way of manipulating genes; it is regarded as the deliberate introduction of semen into a female's vagina or oviduct for the purpose of achieving pregnancy through fertilization by means other than copulation. It can also be seen as the medical alternative to sexual intercourse, or natural insemination. It is a fertility treatment for humans and it is also a common practice in the breeding of dairy cattle and pigs. Artificial insemination can as well employ assisted reproductive technology, donated sperm, and/or animal husbandry techniques.
- **Eugenics**: Genes can as well be manipulated through eugenics. It can simply be described as good breeding, more elaborately, it means to breed better or improve upon what has been bred.[1] It can therefore be seen as good breeding and improvement of the human species through scientific and medical procedure. "Eugenics is the science that deals with all factors that improve the inborn qualities of the human race." Eugenics can be defined as the use of science applied to the qualitative and quantitative improvement of the human genome. Galton defined the term eugenics as "the science of improving inherited stock, not only by judicious mating, but by all the influences which give more suitable strains a better chance".
  Two ways in which planed breeding can be practice are;
- Positive Eugenics
- Negative Eugenics

Eugenicists on both sides of the Atlantic argued for a two pronged programme that would increase the frequency of "socially good" genes in the population and decrease that of "bad genes."

- Positive Eugenics: The means manipulating human heredity or breeding, or both, to produce superior people, it simply means creating the fit. In Britain between the wars, positive eugenic thinking led to proposals (unsuccessful ones) for family allowances that would be proportional to income. Eugenic policies have been conceptually divided into two categories. Positive eugenics is aimed at encouraging reproduction among the

genetically advantaged, for example the reproduction of the intelligent, the healthy, and the successful. Possible approaches include financial and political stimuli, targeted demographic analyses, *in vitro* fertilization, egg transplants, and cloning. In the United States, it fostered "fitter family" competitions. These became a standard feature at a number of state fairs and were held in the "human stock" sections.

- Negative Eugenics: This type simply means improving the quality of the human race by eliminating or excluding biologically inferior people from the population. It can also be described as eliminating the unfit. Negative eugenics aimed to eliminate, through sterilization or segregation, those deemed physically, mentally, or morally "undesirable." This includes abortions, sterilization, and other methods of family planning. On a general note, both positive and negative eugenics can be coercive.

Ethical Implications

From the above instances, it is therefore glaring that new genetics has contributed much in improving the quality of life, not just for human being alone but also in plants and animals and possibly, other living things. The impact is felt more in the growing and replacing of old and dead cell in man. Thus even as we enumerate several demerits of ethical implications as the case may be, the merits or positive contributions of new genetics should not in any way neglected.

Furthermore, with the advancement in new genetics, humans with identical genetic makeup can be produced so that they can be helping each other, as aforementioned in the discussion on fraternal twins. The genetics also helps in assisting infertile couples to have their own children with their own cell, rather than those of others. This can be carried out by using a cell from the man's body to fertilize the wife's ovum instead of using another man's sperm.

In its advantage to man, new genetics one can say has being of immersed contribution in saving lives, through the discovery of one's genetic compositions and requirements. With this, the standard of living can be improved. Above all, new genetics helps to expand one's horizons in basic and in-depth knowledge of certain bodily components and in a way, encourages research.

That notwithstanding, new genetics from a negative perspective reduces man to a mere machine that can be manipulated, as a result of which, man's dignity is disrespected and the sacredness of life tempered. The study of new genetics has also led to the rejection of such ideas as the idea of God's creative act in the human people, by trying to explain some compositions and phenomena in man outside God. With this, man sees himself as capable of doing many things for himself aside God. In sum, new genetics has further led to the emergence of continuous hatred in most families, because of counter discoveries in most issues that are generally accepted.

Conclusion

In as much as new genetics has being of great use to man and other living things, it has also being of a negative influence to man. For in most cases, it has led to different infections of the various cells in the human body through several diseases that are on called for. Consequently, most of its methods are harmful to the various cells which are manipulative to the human system and the dignity of personhood belittled.

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