

GENETIC ENGINEERING - BOON OR BANE?

Genetic engineering manipulates the genetic code of an organism through an artificial process: an effect **that** passes to future generations of the species involved and also breaks the species barrier, its benefits or repercussions are enormous. The science **being** so perilous, its products are considered biohazard; genetic engineers regard it as a blessing, its solution to world hunger **being** undeniable.

Present benefit already includes the creation of crop varieties **resistant** to disease, **requiring** less pesticide and **safeguarding** the environment. Expensive chemical treatment **being reduced**, the cost savings are passed to developing countries.

Products such as genetically modified tomatoes **being sold** in stores, a warning label is usually included in several countries. This probably eases the fear of consumers **trusting** only organic foods.

However, Jews and Muslims are not pleased with the idea of using a pig gene in the crop manipulation, such tampering **adulterating** the domain of God. Greater profits **as** the sole motive, these perpetrators are invoking the wrath of God. Man has no idea what harm his experimentation may bring, an attempt **to change** a future that he cannot foresee.

More food for the world's starving millions may grant a temporary reprieve. Developing countries continue building essential infrastructures for economic growth, their hungry citizens **getting** affordable food supplies.

Protests against genetically modified foods have been restrained, their production and distribution **within** the control of government regulations. People **aware** of tremendous possibilities in the science, only warnings of caution are demanded.

Genetic engineering **which** is evolving with more certainty, scientists are assuring the public that their painstaking efforts are almost an exact science **compared** to past indirect methods of cross breeding, certain genes **being kept** by chance. In fact, genes are transferred one at a time to secure a far greater degree of certainty, a precautionary technique **to guarantee** a non-hazardous consequence. Potential dysfunctional varieties can equally occur in crossbreeding, risks **that** are nothing to be alarmed about. Nature can remedy itself.

Fears of a Frankenstein creation or a crossbreed virus **being played** out in horror movies, there is a sense of tension **prevailing** in society. Crossbreeding having less human interference than genetic engineering, nature may be outwitted.

Serious risks already exist. For example, a soybean variety **engineered** to resist a herbicide was withdrawn because a brazil nut gene **inserted** in the soybean caused an allergic reaction in certain people. Another example was the cotton plant **altered** to resist frost but the produced plants never ripened.

Transparency and honesty **in** their reports to the general public, scientists should gain some trust in their efforts although setbacks do occur.

Unless precautionary measures against serious risks are perfect, genetic engineers should keep their creations in the enclosed biohazard areas. Unfortunately, world problems of overpopulation and hunger may throw caution out of the restricted zone. Wars and conflicts due to shortage of food may exacerbate the situation.

Human genetic engineering involves germ line therapy and somatic cell therapy. Germ line therapy inserts genes to sperm or egg to eliminate diseases in the offspring, **altering** the genetic code for future generations. Somatic cell therapy affects the person in his lifetime. For instance, a diabetic receives a gene to produce insulin internally.

Scientists and governments are not ready to perform germ line therapy, its detrimental effect **being** permanent on all descendants. For instance, the removal of a gene for sickle cell anaemia takes away the immunity from malaria. Also, dictating the characteristics of future generations can give rise to prejudices. Somatic cell therapy is gaining ground when dealing with the individual's genes, the main objection **being** the use of embryonic stem cells for research or treatment. Embryos **being fertilized** in the laboratory, controversial issues arise.

Unfortunately, germ line therapy may produce better results than somatic cell therapy in some difficult cases. The good news for researchers is that governments may favour the use of discarded embryos that end up being destroyed anyway.

Cloning is another highly controversial field, replicas of animals or even people **being produced** from identical genetic material. Humans are like identical twins and yet different in character. Experiments with animals **plagued** with failures and fraud, the fantasy has not reached reality yet.

The idea of cloning oneself appears egoistic. Replacing deceased loved ones with clones is delusional. Cloning celebrities causes them to become commodities. Objections are strong against human cloning.

"Are humans aiming to gain immortality?" Illnesses that are currently accepted as permanent or terminal may become treatable. Diseased organs **being replaced**, immunities in the body **regained** and future generations **engineered** to become a superior race, will genetic engineering become a boon or bane for humanity?

Unless a cure for physical ageing is discovered, the quality of life deteriorates even when life is prolonged. Cloning does not give anyone a new life. Though providing the young with a new lease of life is a worthy goal, seeking immortality is a vain pursuit.

Currently, procedures in genetic engineering **experimental** and **at** astronomical cost, the common argument applies as to whether life should be prolonged or saved at all cost. Death being inevitable, people should be prepared for it when it is pragmatic to do so.

Genetic engineering has great potential but its limits must be recognized and its uncertainty realized before any irreversible damage is done. Researchers must be constrained with high ethical standards and government regulations to ensure sane minds are handling genetic time bombs.

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