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Biotechnology 01

Introduction

The advances in the field of biotechnology has completely blown away entire sets of assumptions mankind used to have about the universe and our place within it. With the advances in the field of reproductive science, for instance, the list of alternatives to sexual reproduction have steadily grown. The perimeters of the ethical minefield that was human cloning have now expanded to include topics like selective breeding and genetic engineering.

It seems that we are on the cusp of breakthrough developments in biotechnology. The possibility of producing transgenic creatures of unprecedented nature and qualities is edging ever nearer to us. [We are able to shape our own destiny and create a world of our own liking. Questions of nurture vs. nature may become irrelevant soon. We could have designer babies.] The prospect of being able to alter our genes to weed out diseases and allergies, create designer babies and deliver drugs to our cells using nanotechnology is both exhilarating and frightening.

However, while the science tells us "yes, we can!" (or at least, "yes, that's possible"), there are factors that create disquiet, and many countervailing considerations abound. Ethical and practical considerations such as encroachments into individuals' privacies, accusations of "playing god", the spectre of bioterrorism and the widening of socioeconomic gaps where only the rich can afford to create a class of "superbabies". [The prospect of our employment being contingent on genetic screening, invasions to privacy are also pertinent questions to ask.] These are all issues which should give us pause for consideration.

cells' immune response in a cancer patient. Trials in the rest of the world are set to follow.

Designer Babies and Eugenics

The creation of what might be termed "designer babes" is another pressing ethical issue that practitioners of genetic engineering and biotechnology might have to grapple with. A designer baby essentially comes from a human embryo that has been genetically modified based on a predefined set of desirable traits as demanded by parents or scientists.

At present, the technology that enables this is called pre-implantation genetic diagnosis, which is a procedure performed on embryos to screen for traits. Potentially, some traits that can possibly be detected and selected include sex, predispositions to illnesses, hair and eye colour, muscle mass or high intelligence.

Further down the road, the prospect of gene therapy being used in the altering embryos to ensure that babies have selected traits is, while not yet gaining widespread adoption or consistent results, something that excites and frightens many. At present, genes can be replaced or inactivated, and new genes can be introduced to attack and replace an infected gene, and the techniques established by the field of gene therapy can potentially be used to create designer babies.

Opponents of genetic modification often argue that if such technology is not tightly regulated, a situation of eugenics may result. In such a scenario, there could be a loss of genetic diversity and genetic variation, which itself has dangerous effects on humanity such as a higher and more severe predisposition to illnesses and epidemics. Furthermore, eugenic policies (or policies that do not actively prohibit eugenics) could lead to a widening of the gap between the rich and the poor, where only high income families and affluent social groups who can afford the technology being more able to perpetuate themselves through offspring with superior qualities.

mental development. However, it should be noted that there are many strong arguments stating how personality traits are as much learnt from parents and friends, particularly in early childhood, as they are genetic.

As for twins – there are identical and fraternal twins. Identical twins are the result of the germination of one ovum, and fraternal twins arise from the germination of two separate ova. The study of twins, especially identical twins, was therefore considered with great interest for the study of heredity. Many studies of twins have been made to discern the percentage of their similarity. However, the many cases of twins having vastly different personalities, and the observation that identical twins reared apart from each other since infancy differ significantly as compared to identical twins reared together, lend force to the argument that the children's environmental in which they grew up also serve to influence their personalities and characteristics to a large extent.

Galton's pioneering work of studying the family histories of eminent British men stimulated other such studies. In 1877, Dugdale completed the study of the inheritance of inferior mentality. He concluded that criminality was an inherited trait. This view is now discredited and merely of historical interest, as sociological studies have come to show us that such traits have its roots in more than just genetic dispositions, but have much to do with other social factors like family and socioeconomic status.

Heredity vs. Environment; Nature vs. Nurture

Today, we understand that inheritance plays some part in the make up of individuals. There are characteristics which are indubitably handed down from parent to offspring, either in whole or in part. For instance, intellectual capabilities is at least partially inborn, and intelligence tests demonstrate that there is a strong tendency for children, on average, to resemble their parents in their intellectual abilities. According to C.W. Valentine, only 25% of a person's intellectual abilities is based on environment and training.

There is an interaction between one's genetic programming and the environment he or she grows up in and lives in. The genetic programme