

Notes on the History of Normality – Reflections on the Work of Quetelet and Galton

LARS GRUE* & ARVID HEIBERG**

*Norwegian Social Research (NOVA), Oslo, Norway, **Department of Medical Genetics, Rikshospitalet, Oslo, Norway

ABSTRACT *This article investigates the historical background of our present understanding of normality and the hegemony of the empirical norm. This is an understanding that is closely linked to the development of eugenics, the rank ordering of human beings, the emergence of rehabilitation and the social construction of statistics within the social sciences. The article describes how the ideas of the Belgian statistician Adolphe Quetelet and his concept of the “average man”, together with the work of the Victorian polymath Francis Galton, who coined the term eugenics, have had lasting influence on how we today conceive the term normality. In the article brief historical glimpses into the birth of rehabilitation and the eugenic practices, which culminated with the killing of thousands of disabled people during the Nazi occupation of Europe are presented. Towards the end of the article it is questioned whether our present knowledge about inheritance and the genetic makeup of human beings can support the understandings leading to the concepts of normal and normality.*

Introduction

In most countries, what might be referred to as the empirical norm, a term coined by the French historian Henri-Jacques Stiker (1999), and the principle of normalization, have long dominated policies for and the care of disabled people. Moser (2000) has pointed out that the normalization approach is constantly counteracted by processes that systematically produce inequality and reproduce exclusions. She shows further that the main problem in relation to integration is a norm that locates agency, mobility and subjectivity in a naturalized and given body. When disabled people are measured against this norm they will always be constituted as different, as other. Using a Foucaultian perspective, Moser argues that discourses, whether in medical practices, ideologies of rehabilitation, disability policies or social theory, work to produce a distinction between ability and disability; the normal and the abnormal.

Correspondence: Lars Grue, NOVA, PO Box 3223 Elisenberg, NO-0208 Oslo, Norway. Email lars.grue@nova.no

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The aim of this article is to investigate the historical background of the present understanding of normality, to illustrate how policies advocating normality have affected disabled people's lives and to present knowledge that may challenge our concept of normality, and what is normal.

The ideal

Davis (1997) states that, without making a too simplistic division of historical periods, one can easily imagine a world in which the hegemony of normality did not exist. He argues, for instance that the bodily ideal, meaning the most proportionate and beautiful body, remained for centuries the ideal found in the classical periods of human history. Ultimate physical beauty and the ideal body were not found in humans, but were traceable only in a divine body, such as the nude Venus. A divine body was not attainable for humans. It follows that when the ideal (divine) body is visualized in art, no single living model sufficed. The artist has to “combine” body parts from a number of models. One person might provide a neck that was close to the ideal, another the hands. This point is well illustrated in a painting by the French painter Francois-André Vincent (Figure 1). Completed in 1789, it portrays the famous Greek artist Zeuxis in the process of choosing models for a painting of Aphrodite, a divine ideal of beauty. To portray Aphrodite, Zeuxis used several living women as models, taking a neck here, a face there, and a torso from a third, and so on. Vincent's painting is called “Zeuxis choosing as models the most beautiful women of Crotona”. On the right-hand side of the painting we see one of the beauties of Crotona, inclined towards another woman and looking very unhappy. Perhaps no part of her body was considered beautiful enough by Zeuxis. A representation of Aphrodite's body would be an idealized body, where what were considered human blemishes had been removed.



Figure 1. Painting by the French painter Francois-André Vincent (1789).

In a culture where only the gods possess an ideal body, remarks Davis (1997), all members of the human population will depart from the ideal. By definition, no one can have an ideal body. Everybody differs from the ideal, no one is perfect. By contrast the opposite of the ideal, the grotesque is a signifier of all that is human. In a sense all bodies are “disabled” when compared to the ideal.

The average man

We can probably thank the Belgian astronomer, statistician and mathematician Adolphe Quetelet (1796–1847) for the generalized notion of the normal as an imperative (Davis 1997). Before Quetelet, statistics, a term first used by Gottfried Achenwall in 1749, were mainly used in the context of gathering information about the state. Later the concept migrated from the state to the body, when Bisset Hawkins started compiling medical statistics in 1829.

In order to understand Quetelet’s way of thinking, we have to look into the mathematics and statistics of the 19th century. In this period, mathematicians and statisticians were often engaged in “error theory” and the use of the “error curve” or normal distribution as it would later be named. The error curve had its name from a theory in branches of learning, such as physics and astronomy, which posited the impossibility of measuring anything with complete accuracy. Measurements were always subject to an irreducible degree of error. However, it was normally possible to make more than one measurement. In this way, the error theorists argued, the most accurate estimate of a quantity would usually be the mean of several measurements. The distribution of measurements were found to follow a mathematical distribution, referred to then as the law of frequency of error or the error curve (Mackenzie 1981). Quetelet discovered that this law of error or error curve also described the distribution of human features, such as height and weight. He developed what is called the Quetelet index, which shows the distribution of weight in a population. We find it today in the shape of the body mass index (BMI). In a famous study, Quetelet measured the circumference of the chest of 5738 Scottish soldiers (Lie & Roll-Hansen 2001). He concluded that the Scottish man *as a type* had a chest circumference of 40 inches (102 cm) on average. Observed deviations were either caused by measurement errors or individual deviances. According to Quetelet all human features and all individuals deviated from the norm. To him, average value was a theoretical concept, something only to be found in the ideal. He argued that it was by measuring a large number of people, with their physical deviances, one would come closest to the ideal of what a human being should look like. A person of God’s creation. Quetelet believed Ancient Greek statues came closest to this ideal because they came closest to his measurement averages. Quetelet extrapolated further and coined the concept *l’homme moyen*, the average man, arguing that this abstract human being could be used to plot the average of all human attributes and features in a population. Quetelet’s average man was a combination of *l’homme moyen*

physique and *l'homme moyen morale*, both a physically and a morally average construct (Davis 1997).

The social and moral implications of this way of thinking led to a justification and honouring of *les classes moyennes*, the middle-classes. With bourgeois hegemony comes the scientific justification of moderation and a middle-class way of living. Within this discourse the *average* was the ideal. The moral and physical qualities of the average man were perceived as the most valuable in a population. Large and small deviations from the mean constituted ugliness in body and dissipation in moral virtue. In a society where the concept of the average was the ideal, deviations from that ideal were considered erroneous. The “right place to be”, with regard to one’s features, was somewhere under the arch of the error curve.

The constellation of words describing the concept of normal, normality, norm, etc., in the way these words are used today, probably entered European languages late in human history (Davis 1997). Until the middle of the 19th century, “normal” meant perpendicular. According to Davis, it derived from the carpenters’ square, also called a “norm”. Historically, normality, norm, etc. entered the European languages more or less coincidentally with Adolphe Quetelet’s introduction of the concept of the average man. And as we have argued, Quetelet made the average the ideal. Francis Galton, the famous English statistician (see below), would later oppose these ideas, though he followed Quetelet in applying the law of error to human beings.

Galton and the normal distribution

In his book *Hereditary Genius: An Inquiry into Its Laws and Consequences*, published in 1869, Galton followed Quetelet in applying the error law to describe human beings and the distribution of human features. However, at this stage of his work Galton developed no new statistical tools. His innovation was to argue, long before the invention of IQ tests, that intelligence followed a Gaussian distribution (error curve). However, the error theory was already proving unsuitable to Galton’s emerging project – eugenics (Mackenzie 1981). For the error theorists, variability or error was something to be measured, controlled and eliminated. For Galton, variability was of interest in itself. He rejected error theory’s contention that all deviations from the mean of a distribution were errors. One could say that error theory acted like an epistemological “straitjacket” on Galton’s eugenics project. Using Thomas Kuhn’s (1970) terminology, one could say that Galton needed to revolutionize this branch of mathematics, error theory and the use of the Gauss distribution as a distribution of errors from a mean value. A new statistical paradigm was needed. In Galton’s opinion, some human traits were more valuable than others. His increasing misgivings about error theory and his introduction of rank-ordering methods in statistics can therefore be traced back to the fact that his goals differed fundamentally from those of error theorists. Being a eugenicist, Galton considered variability within a human population as a potential for racial progress. When he coined the term “eugenics” he defined it as “the study of agencies under social control that

may improve the racial qualities of future generations either physically or mentally” (Galton 1909:81). Galton’s statistical work tended therefore towards the study of variability as an important phenomenon in its own right (Davis 1997). He considered the concepts used in error theory misleading. Is it not absurd, he asks, to think of an exceptionally able person as a large error by Nature. Supporting our statement that Galton needed a paradigmatic “revolution” in statistics, Mackenzie (1981) asserts that it was the “needs of eugenics that in large part determined the content of Galton’s statistical theory” rather than the other way round”, that Galton’s statistics made possible eugenics. This view is also clearly supported in a newly published biography about Galton (Brookes 2004).

In order to adapt the error curve to his eugenics project, Galton had to redefine the meaning of distribution. Instead of using the mean of the distribution (the average) he applied the median of the distribution, i.e. the value of the unit that divides a distribution in two equal parts. He then divided the distribution into four equal parts – quartiles – and called the curve the normal law of frequency or normal distribution. He also ditched the term “error” to describe deviations from the mean, replacing it with “standard deviation”, a term that is free of implications that a deviation is in any sense an error (Mackenzie 1981). In brief, he turned the error curve into a tool suitable for the rank-ordering of humans or human traits.

Galton was convinced that humans differed in relation to character, disposition, energy, intellect, etc. Humans received at birth the “talents” they would have throughout their lives. These various “natural qualities” were determined by inheritance and made up the civic or genetic worth in man. Experience showed, according to Galton, that the distribution of these natural qualities in a population followed the normal law of frequency. Most individuals have middling amounts of these qualities or talents (groups r and R) in Figure 2.¹ Large quantities (groups T,U,V) and small quantities (t,u,v) are found in smaller proportions. In 1909 he used data from a social survey of people in London to map the original social categories onto his own categories (Galton 1909). This was also the year the term genetics² was used for the first time. On the bottom left side of the curve (Figure 2), we find groups with the lowest “civic and genetic worth”, criminals, paupers etc. (v,u,t). In the middle are the “respectable” middle-classes (r,R) and towards the top right we find groups with the highest civic (and genetic) worth, the independent professionals (T,U,V).

Galton has, together with the statistician Karl Pearson, without doubt been the strongest driving force behind the establishment of statistics as a branch of scientific knowledge. It is, however, important to remember that his scientific endeavour was driven by a strong belief in the blessings of racial hygiene, i.e. eugenics. It is an amazing fact that almost all the early statisticians were eugenicists and the eugenics divided humans into groups according to civic and/or genetic value. And peoples’ value was to a large extent measured in terms of their potential as productive workers as industrialization and modernization took ever firmer hold. A belief in Man’s supremacy over Nature emerged; Nature was something to be

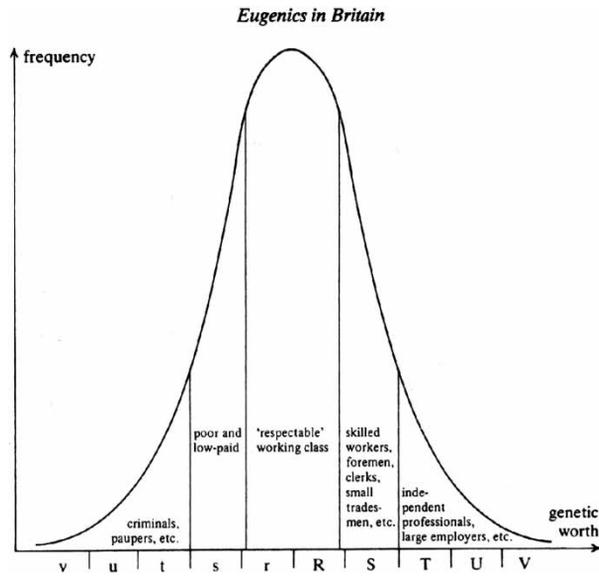


Figure 2. Galton's view of British social structure.

controlled by Man. This scientific and rational discourse (or modernity) viewed Nature, including human beings, as an object to be controlled and manipulated. As we have shown, two ideas were central to this endeavour, the conceptualization of normality and the rank-ordering of humans according to their “natural qualities”. In the next two sections we shall investigate briefly how these ideas influenced conceptualization of disability and treatment of disabled people yesterday and today.

Eugenics and the treatment of disabled people

The eugenic view of the world had an enormous impact on the (social) policies in the first half of the 20th century. The first organization, the Eugenics Education Society was set up in Britain in 1907. Inspired by Galton, the membership shifted from “gentlemanly amateurs” in its first decade, to the professional middle-class in the second (Kerr & Shakespeare 2002). Eugenic societies were established in most western countries and the idea of limiting the number of “the genetically inferior” in the population through the use of positive or negative eugenic means was widely accepted. Even the famous deaf-blind campaigner Helen Keller believed that the objective science of eugenics could be applied to aid decisions about which mentally impaired children should be eliminated at birth. Feminists such as Margaret Sanger and Marie Stopes also supported the eugenic idea (Kerr & Shakespeare 2002). It has been reported that Marie Stopes not only supported the eugenic idea, but that her ideas were too extreme even for a climate favourable to eugenic ideals (Hall 1977).

Eugenic ideas and material could be found many places, such as exhibitions and fairs. Eugenicists conducted lectures for different organizations and popular magazines such as *Good Housekeeping* and *Cosmopolitan* in the USA published articles celebrating eugenics and warning people against marrying into families that carried some kind of human “defect”. A eugenic film, distributed by the American Health Service, between 1922 and 1937, urged “women of tomorrow” to develop strength and beauty through exercise. “Health and success” awaited the visually attractive, it promised. British campaigns called for tax concessions and grants to encourage the middle-classes to breed. The Eugenic Society wanted to legalize the segregation of the “feeble-minded”, and hailed the passing of the *1913 Mental Deficiency Act* as a great victory (Kerr & Shakespeare 2002). Sterilization never became compulsory in the UK, as it did in US, where sex offenders, the “feeble minded, moral degenerates and epileptics” were sterilized. The American eugenics movement was also more focused and preoccupied with issues of race than were eugenicists in the UK.

In the Scandinavian countries too, the eugenic ideas were widely accepted and articles dealing with eugenic issues could be found in magazines and newspapers. We gain an impression of the popularity of eugenic thinking from a special issue of *ALLERS*, one of the most popular magazines in Norway at the time. Here, readers are “educated” in how to judge a person’s character and moral qualities by their appearance (*Allers Familie-Journal* 1926).

In the mid-1930s all the Nordic countries had passed sterilization laws and eugenic programs as part of a wide social welfare experiment. They were supposed to bring economic prosperity and social progress, while limiting the expenses of the emerging welfare state. Genetics in the early 1900s set many of the parameters of these biological engineering programs, embedded in the ideology of optimistic modernism. It could be mentioned that the spokesman for the passing of the law in the Norwegian parliament was a representative from the Farmers’ Party (*Bondepartiet*) MP, Erling Bjørnson. He was a strong nationalist and the son of Norwegian National Poet Bjørnstjerne Bjørnson and became a member of the Nazi Party after the German occupation of Norway in 1940. Being a farmer himself, Bjørnson compared the (modern) management of a country’s population to the management of livestock on a farm (Broberg & Roll-Hansen 1996). Although eugenics was not equally popular throughout the Nordic region (see Broberg & Roll-Hansen 1996: *Eugenics and the Welfare State*, for a fuller account), sterilization laws were pursued with some diligence by Sweden. For instance, there were more sterilizations in Sweden in the 1930s to 1950s than elsewhere in the Nordic countries, both in absolute numbers and in relation to the population (Broberg & Roll-Hansen 1996). However, there was also opposition. In Norway, a well-known geneticist, Otto Lous Mohr, one of the founding fathers of medical genetics, rejected negative and positive policies based on eugenics. He argued that it was much more important to improve living conditions for vast numbers of people, especially children, than trying to improve human nature. He found no scientific evidence for a degeneration

of the European race. Others, such as the socialist and later head of the Norwegian public health directorate, Karl Evang, found eugenic ideas and the sterilization law quite acceptable. In his book on racial policy and its reception (*Rasepolitikk og reaksjon* Oslo, 1934), he attacked the Nazi version of eugenics, but advocated the Norwegian and Nordic version of the same ideas.

On the whole, it seems safe to say that eugenic ideas and policies were widely accepted in the 1920s and onwards. Our point is that the “scientific legitimization” of eugenics was made possible because of the scientific endeavours of statisticians such as Galton and Pearson. As we have shown, the main purpose of eugenics was to prevent degeneration and improve the genetic makeup of populations by stimulating people with high civic and genetic worth to breed. One important aspect of this political vision was at the same time to eliminate or reduce the number of persons with negative hereditary tendencies. Eugenic ideals would often be paralleled with the tending of a garden or the pruning of trees. Only the most valuable plants and flowers should be taken care of, all others, alien to the “perfect garden”, or lacking the potential to become valuable however much one cared for them, should be removed and eliminated. In *Modernity and the Holocaust* (1981), Bauman shows the important role played by simple metaphors in the legitimization of the murder of millions of Jews. However, Jews was not the only group of people that did not fit into the idea of the perfect human garden. Gypsies, homosexuals and disabled people did not fit in either. As a matter of fact the systematic and scientific killing of the “unworthy” started with the killing of disabled people.

The German euthanasia programme started in September 1939. By then, about 375,000 persons had already been sterilized, among them people with psychiatric disorders, epilepsy, Huntington’s disease, blindness, and alcoholism. In regard to the killing of disabled people in Germany, the turning point was a case where a father wrote to Hitler asking for euthanasia of his disabled child. Hitler’s personal doctor, Karl Brandt, inspected the child and authorized its death. This incident fed into Hitler’s euthanasia programme for severely disabled children. It ran parallel to the “official programme” (see below), and was administered by a small group of doctors in Berlin reporting directly to Hitler himself. The group enjoyed widespread support among paediatricians and nursing staff of several hospitals. From its Berlin headquarters, it instructed midwives and paediatricians all over Germany to report every hospital birth and note whether the infant was abnormal in any way. After a time, individual reporting was replaced by a printed form on which health staff ticked boxes for various issues, such as genetic diseases in the child’s family, the use of alcohol and other stimulants, etc. These forms were studied in Berlin and a decision made on the fate of the child. Some of these children ended up at the infamous Görden Clinic in Brandenburg, where they often died (Ustvedt 1997). Besides this “unofficial” euthanasia programme for disabled children, an official euthanasia programme emerged, administered by an organization called T4 (after the address of its headquarters, a villa at no 4 Tiergartenstrasse, the former home of a Jewish family). T4

consisted mainly of SS officers. A group of leading doctors was invited to join the programme. Patients were dispatched to one of several killing centres spread around the country. The patients were selected on medical and “productivity” grounds. Terms such as “useless eaters”, “life unworthy of living” and “human ballast” were in common use (Kerr & Shakespeare 2002). Officially, the T4 programme was halted in August 1941, but the killing went on, especially of children. What stopped was the use of gas to kill sick and disabled people. Instead, they were poisoned or starved to death in hospitals, where the killings were easier to hide. An estimated 275,000 people, mainly disabled, were killed in order to “cleanse the human population of unworthy life”. The disabled children were targeted before adults, and they remained in jeopardy long after the T4 programme was officially closed. In order to realize a fully eugenized society it was vital to eliminate these children. As early as at the beginning of the 1930s one can find examples of a practice to starve disabled children to death, i.e. children with blindness, Down’s syndrome, restricted growth, deafness and the like (Kerr & Shakespeare 2002).

Most killings took place at the Kiev Pathological Laboratory, where somewhere between 110,000 and 140,000 people were poisoned. After the Nazis capitulated in 1945, the head doctor at the laboratory, Dr Wilhelm Gustav Schueppe, was questioned. He was asked how he could possibly justify the killing of disabled people. He answered, “I believe in this system. It is comparable to pruning a tree, thereby removing the old undesirable branches in order to produce the highest yield. In a nation this system must be carried out to prevent decadence”. While admitting to moral difficulties the killing of Jews and other “highly qualified races”, he had no compunction about killing disabled people whose lives were not worth living (<http://www.lawschool.cornell.edu/library/donovan/>).

Even if the eugenic ideas have changed and the misdeeds of eugenics are hard to understand in our modern western world, the concept of normality is still very much with us, and if we look closely enough we may still discover practices that echo the rank-ordering of human life so closely linked with eugenic practice.

Rehabilitation as ideology and policy

The idea of rehabilitation is essentially related to the question of what it is to be a human being, what human beings look like and how they, in general, behave. And, of course, statistics plays a major role in establishing the different empirical norms underlying descriptions of humans and human behaviour. As we have argued, the “discovery” of the empirical norm can historically be linked to the scientific endeavours of both Adolphe Quetelet and Francis Galton in the 19th century.

The terms rehabilitation and habilitation are used in relation to congenital cases as well as cases where reduced function is the result of an accident or disease. They convey a sense of returning, of bringing back to or re-establishing a former situation. Something has been taken away or lost and

the object of rehabilitation is, as far as possible, to recoup what has been taken away. Losses are always depicted with reference to a certain norm. Stiker (1999) sees the term used first in the 1920s in conjunction with the vast number of maimed WWI soldiers needing treatment. A maimed soldier is a person missing something. The war took something away and this something had to be replaced. The prevailing idea was that a person who had lost a function or organ should try to lead as normal a life as possible and find his place in society.

Prosthesis is a term with close links to rehabilitation. According to Stiker (1999), it not only refers to body part replacements made of wood or some other material, it refers to the very idea that such a part can be replaced. As the years went by, he says, all impaired persons become like the war-wounded; persons who lack not only an organ or a function, but also a place in society. For them a place has to be made, they have to be integrated into the social fabric and not stand out as different. Once they have been integrated they have to return to normal life, to work. Stiker makes the following point:

Rehabilitation marks the appearance of a culture that attempts to complete the act of identification, of making identical. This act will cause the disabled to disappear and with them all that is lacking, in order to assimilate them, drown them in the greater and single social whole. (Stiker 1999:128)

Stiker argues that in societies where the empirical norm is *the* norm, anybody deviating from the norm threatens it somehow, and has to be integrated to assuage the threat, be made passive and invisible. Echoing Michel Foucault, Stiker argues that societies opposed to difference offer approaches such as psychiatry and vocational rehabilitation as means to integrate those who represent human differentness. A central point is that liberal, prosperous and technologically advanced societies apply several means to disguise disability and that they – the disabled – will be accepted by the able-bodied if they accept the ideas and the norms of the able-bodied.

During the first period of rehabilitation the focus was on the body and the mind of disabled people. To normalize the disabled body and the disabled mind was a central idea and an idea closely related to the medicalization of disability that had taken place since the beginning of the 19th century. The idea that disabled people needed to be “straightened out” or normalized in both mind and body was central to the treatment of disabled people, especially in the Nordic countries. For example a number of corrective devices was developed and as long as into the 1980s great efforts were put into treatment programs to make physically disabled children (i.e. children with cerebral palsy) walk “correctly” and not to be dependant on technical aids.

It may seem like a paradox, but the “model” that was launched as alternative to this institution and treatment-based special care was also labelled normalization. This new principle however aimed to normalize disabled peoples’ living conditions and situations, as opposed to the correction and normalization of the disabled body (Moser 2000). This new way of thinking about rehabilitation is still the central idea in today’s rehabilitation policies, at least in the Nordic countries.

Even if the exclusion or marginalization of disabled people will never disappear completely, the problem may not be our failure to integrate, but that we (formally) integrate too well. It may well be that disabled people are being integrated to oblivion and invisibility. In cultures as insistent on normality and similarity as our own, the time may come when the voices of disabled people may be silenced because disabled people are perceived as being no different from others, with the same (formal) rights and opportunities as everyone else. In such a society their voices will not be heard simply because their claims will not have legitimacy. “What are they complaining about? They (disabled people) have the same rights and opportunities as we have (the non-disabled)”. A paradox embedded in the ideology and discourses of rehabilitation and normalization is that disabled people are so designated in order to be integrated. They are made visible in order to be “normalized”.

In earlier times, before the “invention” of normality, conditions for disabled people could certainly be harsh, but they were probably not singled out as a special group, and labelled “abnormal”. Throughout history there have always been rich and poor, able and less able. Today, disabled people are considered to have the same or similar rights as the rest of the population and, according to Stiker again (1999), there is no better way to escape the presence of strangeness than by forgetting aberrancy through its dissolution into the social norm. He makes the following point:

Rehabilitation has moved out in front of the hospital (from which it derives, so this is only logical). In principle, it shuts the door on the practice internment. But to open the door on what? On to the negation of disability through adjustment, integration. It entails fusing abnormality with the normality that is established and recognized by social consensus. We are obliged to note that this constitutes a new confinement. Specificity and aberrancy are forbidden and condemned (Stiker 1999:136).

This leads us to the last questions to be discussed in this paper. How useful is the concept of normality in relation to new (biological) knowledge on human variation caused by genetic mutation and does this new knowledge support the idea of rank-ordering humans?

Normality and genetic variation

When Adolphe Quetelet coined the term *l'homme moyen* and Francis Galton renamed the error curve and introduced the idea of rank-ordering humans, neither knew much about human variation – genetically speaking. Galton argued that humans were born with a number of inherited qualities and that the number and quantities of these qualities were given at birth as a “definite endowment” (Mackenzie 1981). The totality of these qualities determined the genetic worth of a human being. At the time, of course, knowledge of the structure and function of the genes was scant. It was not until the end of the 1950s that a new molecular biology began to emerge. But even then, the new discoveries were often based on a highly reductionist approach to human biology. For example, Crick and Watson’s description of DNA structure in

1953 “emboldened” geneticists with eugenic sympathies and Crick was among the vanguard of this new interest in eugenics. In 1961 he called for a large-scale eugenics programme (Kerr & Shakespeare 2002).

Since Crick and Watson’s paper in 1953, genetics has come a long way. Today we know that the human genome consists of about 30,000 genes and that any of two people are 99.9% identical. However, as Leroi (2003) puts it, there is no such thing as a perfect or normal genome. In the most recent generation of the world’s inhabitants, each base-pair in the human genome mutated on average 240 times. Accordingly we are all different, even if any two people are 99.9% identical. As Leroi puts it:

Perfection (in relation to genes) is far more problematic. The only reason to say that one genetic variant is “better” than another is if it confers greater reproductive success on those who bear it; that is, if it has a higher Darwinian fitness than other variants. It is likely that the most common variant is the best under most circumstances, but this cannot be proved, for the frequencies of gene variants are shaped by history, and what was best then need not be best either now or in the future. To prefer one polymorphism over another – or rather to prefer the way it surfaces in our looks – is merely to express a taste (Leroi 2003:17).

Leroi tells us that many of the mutations that batter our genomes do us harm. Each new embryo has about one hundred mutations that its parents did not have. These mutations are unique to a particular sperm or ovum and are acquired while these cells are in the parental gonads. Out of these hundred mutations about four will alter the meaning of genes, and about three will be harmful in one way or the other. If we also include the inherited mutations, every newborn child bears on average 300 mutations that may impair its health in some fashion. And no one escapes this mutational storm (Leroi 2003). As a result, some of us are born with a large number of mildly harmful mutations, and others are born with one mutation to devastating effect.

The point Leroi makes is that there is no point in asking who the mutants are, the reason being that we are all mutants. So, what is the lesson to be drawn from our current knowledge about human biology? (For a more detailed presentation of available knowledge see: http://www.ornl.gov/sci/techresources/Human_Genome/links.shtml). We would be inclined to argue that, biologically speaking, the notion of normality and a biologically based rank-ordering of humans have little support in current human genetics. As a consequence, we should not refer to human traits and disabilities as deviations from a norm, but focus instead on the fact that we are all “mutants” and therefore unique, however much we are 99.9% identical. And unlike Galton, we should be interested in, and focus on human variation in a way in which variation represents the “norm”. As human beings, we have a lot in common, but at the same time we are all different from each other. The fact that some people carry mutations that surface as diseases does not alter the fact that all of us are carriers of mutations that potentially can be harmful, even devastating, if activated.

Concluding remarks

We want to make two concluding points in relation to what we have discussed so far. The first relates to the historical basis for assessing some people as less valuable than the rest (“the normal”), most direly expressed through eugenics and the idea of “selective breeding” to purify the human race. Even if Francis Galton and his followers in the UK probably contributed most to the development of a scientific eugenics theory, other important contributions came from across continental Europe, most notably from the French doctor Benedict Augustine Morel (1809–73). In 1857 Morel published *Traite des degenerescence physique, intellectuelles et morales de l'espece humaine* (Paris: Masson 1857). The issue that propelled Morel to international fame was the disfiguring form of mental and physical impairment called cretinism. As Morel could not have known cretinism is caused by a congenital thyroid gland deficiency. He did however conclude that cretins suffer from an incurable hereditary disorder. In his book he introduced a new medical diagnosis to account for the symptoms. He called it degeneration. Degeneracy was considered a theory that unified diseases doctors earlier believed were separate disorders. When a patient presented symptoms of tuberculosis, hysteria or cretinism, Morel did not see separate diseases, only different expressions of a single underlying disorder, degenerate heredity (<http://www.gayhistory.com/rev2/events/1857.htm>). Morel argued that one's social milieu had as much to do with one's physical and mental state as heredity and argued that habitation in overpopulated or unsanitary areas submitted an organism to new causes of decline and consequently of degeneration. Morel believed that degenerative traits could be passed on to the next generation and, consequently, he was afraid that if these degenerates were allowed to reproduce they would damage France's (genetic) heritage. He also believed that cretins and other degenerates contributed little to society. Advocating an early French version of eugenics and advocated ideas about degeneracy and racial purity, he was viewed by his contemporaries as a kind and enlightened man. He did not, however, recommend incarceration of degenerates, but the creation of comfortable mountain asylums where they could live unrestrained (<http://www.brown.edu/Research/Equinoxes/journal/journal.html>).

The second point we want to make is that, during different historical periods and in different cultures, some people have probably always been looked upon and treated as different, as “others”. Foucault (1994) identifies three categories of “abnormal”, the human monster, the individual to be corrected and the onanist. The human monster is an ancient notion whose frame of reference is the law, both the juridical and the natural law (Foucault 1994). According to Foucault, what makes a human a monster is not just its exceptionality in relation to the common form of the human species, but also the disturbances it brings to juridical regularities such as marriage law, canons of baptism or rules of inheritance. The human monster combines the impossible and the forbidden and throughout history, different features of the monster's exceptionality have been valorised. The individual to be corrected is

a more recent figure than the monster. The emergence of the “incorrigible” is linked to the disciplinary techniques applied by the military and educational establishments in the 17th and 18th centuries, the new procedures for training the body and eliciting proper behaviour aim at restoring or improving people in need of “restoration”. Institutions to this end were established for people categorized as deaf-mutes, mentally “retarded”, etc. The third abnormality identified by Foucault was the onanist, a phenomenon of the 18th century. He emerges as part of the new relation of sexuality and family organization, with the child at the centre of the parental group and the sexualization of body of the child (Foucault 1994). We will not explore Foucault’s arguments about the different types of abnormality. His main points are that Morel’s work supplied a framework justifying classifications and responses to “abnormal” people and that society established a variety of institutions to protect themselves from these “abnormal” persons.

It is probably easy to document the fact that some sorts of identification and marginalization of “other” or “abnormal” have taken place in different societies and historical periods. However, in presenting this paper our aim has been two-fold. Firstly to show how the *scientific* rank-ordering of people and the introduction of the concept of normality are closely linked to the scientific endeavours of the early eugenicists, most notably Francis Galton. Secondly, we have, in the light of new knowledge about human genetics, wanted to question whether the concept of normality is empirically fruitful in connection with human biology – at least in relation to impairments resulting from genetic mutations.

Notes

¹ See Mackenzie (1981).

² A term coined by the biologist William Bateson (1861–1926).

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