

Postface

The papers in this issue of *Medicina nei Secoli* were originally presented at a conference in Palermo in May 2015 at the end of a major FIRB project “Towards a Lexicon of genetics and its degenerations from Hippocrates to ICD-10”. Its scope was wide, ranging from the Ancient Greeks to the present (and even, in Calame’s paper, beyond, with speculations about the future), as was its intention - to create a dialogue between two apparently disparate areas of research. This introduction, by a participant in the conference whose original paper, on anatomical anomalies in the works of Vesalius (1514-1564), would have stretched the limits of this volume even more, aims to emphasise some of the broader themes within the volume as a way of encouraging further reflection.

As the whole volume shows, ideas on human creation have stimulated debate for millennia. Modern science may have solved many of the questions posed by the Greeks, but the complexities of DNA have thrown up new problems, and even, with epigenetics, some old solutions. Particularly challenging in all its aspects has been the discovery of genetic anomalies at a DNA level leading to a variety of disabilities. Modern explanations, although useful, go only some way to resolving older dilemmas and have in turn engendered new moral, legal and scientific debates that go far beyond the medically possible. Society’s reaction to disability and degeneration is one of the themes explored in these essays. Degeneration itself, as is here explained, is a relatively modern term of the nineteenth century, despite its classical formulation. It was a perhaps inevitable counterpart to the massive changes of that century, and not least the growth of cities. Those who succeeded could view those who did not, and, still more, those who slid from original respectability to poverty and worse as in some way degenerating to an at times sub-human state. Lombroso’s discovery

or invention of the criminal degenerate is only one example of the fusion of economics, science and morals that led to later moral panics and, worse, to the condemnation of whole sections of society and social activity, not only in Nazi Germany, as worthy of elimination. Antiquity may have been more supportive of the disabled or mentally unfit. Debate still rages over the extent to which child exposure was common, or even encouraged, as in Sparta, by ideals of masculinity. The discovery of over a hundred bodies of young babies buried together at a relatively remote spot in the Chiltern woods of S. England may indicate that the site was close to a brothel, where unwanted births were quickly disposed of, or that the custom was practised over a much wider area. But in later life there seems to have been little formal hostility to those with disabilities, although legal regulations prescribed restrictions on those deemed to be mad. Athenian citizenship laws were not unique in not discriminating against such as dwarfs, were represented in art in a friendly and sympathetic rather than a hostile manner. Blindness and physical deformity are similarly not viewed as a reason to abandon contact. But particularly congenital defects, even today, raise questions of causation or responsibility. Parents of a Downs child are still prone to blame themselves or to ask why this has happened to them. Ancient explanations involved a similar range of ideas, including the religious, which could also account for the phenomenon of sterility. As several authors show, there was a range of theories about conception, and the role of male and female in contributing to the resulting child, whether in determining whether it was male or female or in explaining any defect as brought about by nature or actions of a parent. This might range from a missing finger as a result of an incomplete or ineffective mixture of essential substances or fluids within the womb to a birthmark, which according to a long-lasting popular belief was produced by the mother seeing or imagining a thing or a person and thereby influencing the development of the child in the womb.

A major debate in the Hippocratic period, around 400 BC, concerned the roles of *'physis'* and *'nomos'*, terms whose complexities are only partly covered by the modern dichotomy of 'nature' and 'nurture'. The author of *Airs, waters and places* argued that certain characteristics of skin or hair colour were the result of climate and locality, even suggesting that some acquired characteristics could be eventually transmitted genetically to the unborn child. By the time of Galen, six hundred years later, this theory of local determinism had expanded to include behaviour as well as physical form, and this in turn was transmitted to the Arab-speaking world from the ninth century onwards. It was further buttressed in the Middle Ages by the growth of astrology (which linked the configurations of the heavens to the very make-up of the individual) and of physiognomy, which stressed the moral identities behind facial shapes and expressions. These apparently empirical correspondences contributed to creating the trust in the authority of the physician that many authors believed (and continue to believe) lies at the very basis of medical success. The on-going role of DNA in bringing criminals to justice, as well as in providing information about the future health and well-being of the embryo throughout its life, also depends on the non-expert's belief in the accuracy and reliability of the relevant tests. But whether we are talking about the notebook of a Renaissance physician that could have been written centuries earlier, notions in the Koran, or the typology of modern genetics, with its 'super-females', 'individual chemistry' and epigenetic modifications, the words that are used also determine how we think about what is taking place in the body. 'Cuttable strings', 'DNA maps', 'chemical processes' each conveys a different model of the body and its workings, which precisely because of its applicability in one situation may preclude other possibilities. The notion of 'cause', familiar from Hippocrates and Aristotle onwards, becomes ever more complex as a way of understanding the body, or, perhaps better, the questions that are implied by the term become ever more wide-ranging.

These essays, by specialists in both modern genetics and the history of the classical tradition in medicine, show what possibilities may be gained from such an interdisciplinary dialogue, not least because what is familiar to one group may challenge the other to new thoughts. But there is one intellectual link between the two groups that has become ever more apparent in recent years. The Hippocratic physicians and, after them Galen, their most assiduous and authoritative disciple, emphasised above all else that the medicine that they offered and the theories they proposed concerned the individual. Understanding the individual patient, in health as well as in sickness, was the task of the doctor, difficult though it might be. Many conditions, Galen argued, were brought about by harmful changes taking place at the deepest level of the body's constitution, the 'mixture' of qualities or humours that made up each part of the body, even the tiniest, and allowed it to function properly. This might be modified by almost anything, from climate and diet, to incomplete or adverse changes during the process of conception. In many ways this is an idea that comes close to that of modern DNA - although Galen could operate only on the level of macro-observation - in trying to understand disease or disability in the individual. We are not yet fully at an individualised medicine, although that has already arrived for certain conditions, but it is clear that scientists are now having to wrestle with many of the same intellectual problems as the ancient Greeks. Galen characterised them as 'philosophical', a term that goes far wider than its modern meaning, and his medieval successors talked of a 'natural philosophy'. This quest for explanation, as these essays show, is still at the heart of modern genetics, and still continues to inspire reflections and investigations into our human condition.

Vivian Nutton