

The Scientific Sources of the Paradox

The paradox at the heart of the ASA statement centred on the meanings given to ‘race’, a word that has been used in West European languages from the fifteenth century; first in Spanish from 1435, then in French from much the same time as in English, where it was recorded from the beginning of the sixteenth century. Over the centuries it has acquired additional meanings.

Two Dimensions

From the sixteenth to the eighteenth centuries the English people’s ideas about themselves and about other peoples were structured by the anthropology of the Bible. This encouraged the belief that all humans descended from Adam, and that differences between them were to be explained genealogically. Whereas scholars wrote in Latin, ‘race’ entered as a word in the vernacular languages. From the beginning it had two dimensions of meaning. Its vertical dimension identified the historical origins of what made a set of persons distinctive, emphasizing heredity and genealogy. This meaning fitted with the anthropology of the Bible. It was exemplified in John Foxe’s *Book of Martyrs*, of 1570, when he referred to ‘the outward race and stocke of Abraham’. The word’s horizontal dimension identified the nature of that distinctiveness.¹ There was no word in Latin that combined the two meanings of the word.

From the fifteenth to the eighteenth centuries the meaning given to the word primarily reflected the word’s vertical dimension, identifying a set of persons sharing a common ancestry. This is the sense of race as lineage that is still sometimes evoked in the twenty-first

century. While the two dimensions have always been present, over the past two centuries the horizontal dimension of meaning has often outweighed the vertical one.

Scholarly use of the word was sometimes influenced by popular thought. Some writers have therefore wondered whether use of the word ‘race’ indicated the presence of a racial consciousness. They have noted that in the sixteenth century writers in France started to interpret the history of their country as stemming from a clash between the indigenous Gauls and the invading Franks, and that the two were seen as distinct races. In England during the same century, defenders of the parliamentary cause against royal claims to rule by the ‘divine right’ turned to Tacitus’s account of the customs of the Germans. They used this to maintain that the English were ‘descended of German race’ and that therefore the institution of monarchy was alien to them. Political clashes made religious differences important because the Catholic Church contended that the powers of the state should be used to support its faith.

Popular usage, however, has often been very loose, as can be illustrated by dictionary examples, such as John Milton’s reference in *Paradise Lost* (1667) to ‘the race of Satan’; by Sir Philip Sidney’s approval (1580) of ‘the race of good men’; and by Charles Lamb’s 1821 essay on ‘the two races of men’ (who turn out to be ‘the men who borrow and the men who lend’). Charles Kingsley, a Victorian cleric who had much to say about race, sometimes used the word very loosely, as when stating that ‘there is no more beautiful race in Europe than the wives and daughters of our London shopkeepers’; when he lectured in Cambridge this terminological extravagance seems to have spread to his students, one of whom explained, ‘for undergraduates are an affectionate race.’² Sir Winston Churchill wrote about the British as ‘an island race’, while in 1986 the House of Bishops of the General Synod of the Church of England declared that ‘Jesus is also the “Second Adam”, the Head of a new race in the Spirit’.

From the Renaissance until far into the eighteenth century most of the knowledge about human variation was synthesized in what was called natural theology.³ Nature was to be studied as providing evidence for the belief in the Bible’s record of creation and for a better understanding of the creator’s plan. Thus a book by the pioneering biologist John Ray, published in 1691 and titled *The Wisdom of God Manifested in the Works of the Creation*, was described by Ernst Mayr as ‘not only a powerful argument from design but also very sound natural history, indeed, one might say one of the earliest works of

ecology'.³ In this intellectual atmosphere little is to be gained from trying to separate the embryonic scientific knowledge from popular or practical knowledge.

Taxonomy

Such a separation becomes more useful with the publication in 1735 of Carl Linnaeus's great work that, over the next fifty-eight years, ran through thirteen editions. The tenth edition, which is considered the most important, bore the title *Systema naturæ, sive regna tria naturæ systematice proposita per classes, ordines, genera, & species* (translated as System of nature through the three kingdoms of nature, according to classes, orders, genera and species, with characters, differences, synonyms, places). The three kingdoms were the animal, vegetable and mineral. Over twelve thousand species of plants and animals were assigned to the categories of genus, species and varietas. The members of such categories are now called taxa and the name subspecies has superseded varietas.

By systematizing existing knowledge, Linnaeus offered a new understanding of the natural world, one that rested on the validity of the categories it employed. By 1766 the evidence of diversity within species was leading Linnaeus to entertain doubts about his assumption that God had created each species separately, and that no new species could arise. In the eighteenth century, these were fundamental issues. Other doubters at this time went further, one of them insisting, 'There are only individuals, and no kingdoms or classes or genera or species.'

The word 'race' did not feature in the Linnaean scheme, and had scholars continued to write in Latin and kept to his taxa, the ambiguity of the vernacular word might not have caused trouble. However, German scholars began to write of *rasse* and French scholars to write of *race* (in the French); they tried to insert this postulated category into the classification of genus, species and varietas without securing any agreement about how it related to the existing taxa. Thus in his magisterial work *Le Règne animal*, of 1817, Georges Cuvier (later Baron Cuvier) used the ordinary language word 'race' as a synonym for variety, stressing the horizontal dimension.

This is the true beginning of the history of race as a possible scientific concept. It is from this time onwards that the practical and theoretical forms of knowledge about biological inheritance can be distinguished.

Those who translated Cuvier's work into English faced a problem. His first English translator took it upon himself to reduce some of the confusion, for in the 1827 London translation, Cuvier's reference to 'certaines conformations héréditaires que constituent ce qu'on nomme des races' appears as 'which constitute what are called varieties'. Yet in the next English translation (published in New York in 1831) the sentence runs 'which constitute what are termed races,' and 'race' is used thereafter.

Typology

The main source of scholarly debate about race in the nineteenth century was whether race could be equated with species or with subspecies. It was confounded by references to racial type. A new wave of writers, the racial typologists, stressed the horizontal dimension, the fact (for so they regarded it) that the main human stocks had always been distinct. That Europeans had developed further in technology and economic and political power was not in doubt. The question was whether the difference was attributable to circumstance, such as the nature of the environment, or, as the typologists maintained, that it was original and permanent. The word 'race' could be used in both kinds of explanation.

In the United States, Samuel Stanhope Smith, president of what was to become Princeton University, asserted in 1787 that Christians were not at liberty to question the Biblical account of creation. He maintained that the Negro form was changing so as to resemble the higher form of the whites. In a new and better environment, any inferiority would be overcome. Contemporaries who found explanations in biological inheritance were put on the defensive.

The main challenge to biblical orthodoxy came in 1839 when a Philadelphia doctor, Samuel George Morton, published *Crania Americana*; he reported his measurements of the internal capacity of a collection of skulls, and concluded that whites had the biggest brains, blacks the smallest and that browns came somewhere in between. This book, together with the more popular volumes by Josiah C. Nott and George R. Giddon (notably *Types of Mankind* of 1854), constituted the American component of a new international school of thought. It maintained that distinctive racial types had existed throughout recorded history, each of which was suited to a particular continent or

zoological province, and that individuals belonging to a particular racial type displayed an innate antagonism towards individuals belonging to other types.⁴

The French component of this school is best known through Arthur de Gobineau's four-volume essay, *The Inequality of Human Races* (1853–55). In Britain, the pioneer of racial typology was Charles Hamilton Smith, author of *The Natural History of the Human Species* (1848), but its first active propagandist was the Scottish anatomist, Robert Knox, author of *The Races of Man* (1850). In Germany, Karl Vogt published similar views.⁵

Some typologists held that pure races had existed in the past, and that, because their distinctiveness was related to natural environments, they would eventually repurify themselves. Others, like Gobineau, held that the mixing had gone too far and that the process of decline could not be halted. Their theories were pre-Darwinian attempts to account for human diversity and were often vehicles for the political opinions of their exponents. If humans belonged in races, was this classification to be equated with the distinctiveness of a species or a variety? For blacks and whites to be accounted separate species, it would have been necessary to establish that hybrids between them were infertile. This was obviously not the case, so the typologists were stymied. The confusion was such that in 1863 the president of the Anthropological Society of London complained that 'science can make no advance while hardly two persons use such an important word as race in the same sense.'

By this time the word 'race' had nevertheless gained a secure place in the ordinary language of English speakers. It was so effective in organizing much existing information about humans, including popular conceptions of their history on the earth, that many of those interested in human differences assumed that it must be a taxonomic category of some sort. The next chapter will trace the process by which the typological conception became so important in popular thought in the United States. This chapter will remark on how in the twenty-first century it could still influence the interpretation of new scientific findings.

Darwin and Mendel

In the 1830s Darwin thought of species as forms that were kept distinct by reproductive isolation. He wondered how it was that plants

apparently belonging to the same species could be found on widely separated islands in the Pacific. Could their seeds have floated on ocean currents? So he investigated wind speeds and conducted experiments to see how long such seeds could survive in salt water. In this way he could reach an explanation of an observation. Why did the peacock have so big a tail when it impeded flight and might attract predators? Darwin's answer was that the females of the species inherited a preference for mating with the males who could make the finest display; it was his theory of sexual selection. In each case an observation identified a problem within the existing framework of knowledge, and, by the discovery of an explanation, knowledge grew.

By 1859 Darwin had come to believe that the term 'species' was 'one arbitrarily given for the sake of convenience to a set of individuals closely resembling each other, and that it does not essentially differ from the term variety'.⁶ The Linnaean distinctions of 1758 did not help him find explanations of the things that puzzled him. In their endeavours to see if species and varieties could be separated, botanists made more rapid progress than zoologists because plants could be bred in cultivation more quickly than animals (though of course Darwin took an intense interest in the breeding of pigeons). The botanists could more easily identify the contributions of particular chromosomes than their colleagues in other fields.

Darwin did not use the word race with the meaning that became dominant in the twentieth-century USA. His focus was always on the explanation of differences and similarities. Classification was important in so far as it aided explanation; it was not an end in itself. Noting the lack of agreement about taxonomic criteria in twelve notable classifications of human races, Darwin observed that 'the most weighty of all the arguments against treating the races of man as distinct species is that they graduate into each other, independently ... of their having intercrossed'. Every naturalist confronted with such a problem, he wrote, 'will end by uniting all the forms which graduate into each other as a single species; for he will say to himself that he has no right to give names to objects which he cannot define'. Already by 1871 Darwin recognized the power of the ordinary language construct of race when, having noted that the human forms in question might appropriately be called sub-species, he concluded, perhaps sadly, that 'from long habit the term "race" will perhaps always be employed'. Returning to his main point, he stated that 'it is almost a matter of indifference whether the so-called races of man... are ranked as spe-

cies or sub-species⁷. His profession of indifference on a matter many considered vital should make every reader pause.

It looks as if Darwin professed indifference because his concern was with variation. That was his explanandum, the set of facts to be accounted for. The typological concept of race had been advanced as part of an argument about whether different varieties of *Homo sapiens* had a common progenitor. Darwin preferred not to be involved in this argument. He was far from indifferent about research into what in ordinary language were called 'domestic races' (like pigeons and dogs) because the study of breeding practices could offer clues to the sources of biological variation. If, from 'long habit' (i.e., in ordinary language), people regarded racial differences as facts they were building ideas of race into their explanandum, assuming it had explanatory value, instead of seeing whether it was useful as part of an explanans.

Though Darwin's discoveries destroyed any notion of permanent racial types, this was not immediately apparent. The scientific implications of the theory of natural selection were complex, and became more so with the belated discovery in 1900 of the results of Gregor Mendel's experiments with peas, for they helped explain what determined the inheritance of their characters. A fierce dispute followed between the biometricians, who took their lead from Francis Galton's law of ancestral heredity, and the Mendelians. The former focussed on continuous variation as analysed by Darwin, the latter on the discontinuous variation that sprang from mutation. On a strict interpretation of the growth of knowledge, the history of race as a candidate for entry into the vocabulary of science came to an end once the significance of Mendel's discoveries was appreciated. The place it sought went instead to the concept of phenotype, defined by Wilhelm Johannsen in 1909 as 'the sum total of the observable features of an individual, regarded as the consequence of the interaction of its genotype with its environment.'⁸ Johannsen was the Danish botanist who coined the word 'gene' for the unit of inheritance.

The process of eliminating race as a possible scientific concept was completed when, in the 1920s, the mathematician R. A. Fisher subsumed the biometricians' and the Mendelians' explanations in a new model of the processes of inheritance. His 1930 book, *The Genetical Theory of Natural Selection*, showed, among much else, that it was the gene, and not the species, that was the unit of selection. Together with the biochemist J. B. S. Haldane and the US geneticist Sewell Wright, he helped create the new field of population genetics.⁹

Seen in retrospect, it looks as if the Darwinian revolution of 1859 took some seventy years to complete and that it was a prelude to further revolutions in biology highlighted by Francis Crick and James Watson's discovery of the structure of the DNA molecule in 1953, and Craig Venter's sequencing of the entire human genome in 2000. A point to note, however, is that it took a generation for some anthropologists to appreciate the significance of population genetics for the study of 'racial' variation. In the meantime, popular ideas about race had done great damage. Opinion in the wider public was engaged by a movement, sometimes called Social Darwinism, in which some authors advanced a selectionist theory according to which, possibly aided by eugenicist measures, selection would create pure races in the future.

Two Vocabularies

The first lesson that the sociologist of race relations can draw from this history is that, within a little less than a hundred years, the ordinary language conception of race as a division, of either the Hominidae or of *Homo sapiens*, could gain such a hold in the minds of Europeans and North Americans that even the specialists had difficulty liberating their work from it. After an interval, it is now possible to trace the course by which knowledge grew. Moreover, hindsight makes it possible to see that the contrast between a social conception of race and a supposed biological concept only confers respectability upon an idea that was never properly accepted in biological science. The popular impression of race as a biological concept lingered because the eugenics movement captured public attention and because – in a diffuse fashion – it attracted politically motivated support. Most of the anthropologists of this generation could not cope with the reorientation demanded by new biological knowledge. Their disorientation was demonstrated by the failure of the 1934 'Race and Culture' committee of the Royal Anthropological Institute in London to agree on which forms of human variation could be explained as the outcome of biological inheritance.¹⁰

The second lesson is that, by seeking explanations of puzzling observations, knowledge about human variation never ceases to grow. The sociologist gains little from trying to ascertain the very most up-to-date account of thought in genetics because knowledge in this field

is growing so rapidly that any statement may quickly be rendered out of date by the publication of new findings. In no scientific field can knowledge be regarded as static. In the social sciences, the growth of knowledge follows the same rules, though it has to grow within a more contentious political environment, both international and national.

This summary account of the scientific sources of the 2002 paradox can continue by noting that one of the earliest actions of the United Nations was to ask UNESCO (the United Nations Educational, Scientific and Cultural Organization) to initiate and recommend 'the general adoption of a programme of disseminating scientific facts designed to remove what is commonly known as racial prejudice'. Setting about its task, UNESCO consulted a variety of experts. It was striking to note that in the 1950s some experts in physical anthropology still had not properly assimilated the implications of population genetics for their conceptions of race. The geneticists were starting from observations that bore upon hypotheses and were challenging the concepts used in their field; the errant anthropologists, on the other hand, were assuming that race was an appropriate concept for the purposes in question. They were forcing new observations into an obsolete framework.¹¹ In any field of inquiry there can be a problem of how to identify and dispose of scientific waste.

Correspondence in *Current Anthropology* in the mid-1960s showed the continuing strength of comparative morphology in Poland. In Vienna prior to 1993, the Natural History Museum included a hall known as the *Rassensaal*; this displayed a series of exhibits representing the 'human family' as divided into three 'great races' and a series of types. Though from a scientific point of view the display was at least twenty years out of date, it needed a public controversy to elicit a promise of modernization.¹²

In 1978 the General Conference of UNESCO, consisting of representatives of all member states, adopted by acclamation a Declaration on Race and Racial Prejudice. In Article 1 it proclaimed, 'All human beings belong to a single species.' This statement came a century late, for by 1978 knowledge had moved on, and species membership was no longer a critical issue in biological science. Other concepts were more important to scientific progress.

The story of what happened to the proposed concept of race in the nineteenth century illustrates the nature of theoretical concepts (as opposed to the conceptions of ordinary language) that was mentioned

in the introduction. In the contexts in which ordinary language is used, fine distinctions or possible ambiguities may not be important. Ordinary language words often acquire new meanings. Thus the 2002 ASA description of race as 'a principal category in the organization of daily social life' called up associations with the black-white divide and relied upon a meaning that the word did not have a century earlier.

Technical language seeks, among alternative definitions, a single, agreed definition; the one with the greatest explanatory power is preferred. This is an external criterion of selection. Mendel isolated the paired units of heredity, now known as genes, as occurring in alternative forms: AA and aa in the parental varieties, and Aa in the hybrids. Mendel called the character that prevailed in the hybrid dominant, and the one that appeared to be suppressed recessive. These were two new technical, or *etic*, constructs. The point to note is that the constructs were the outcome of the experiments that made their creation necessary. New discoveries necessitated the coining of new words.

The distinction between the two kinds of knowledge is conceptual, and it can be difficult to trace because some words that have single meanings in a theoretical language may also be used much less precisely in popular speech (e.g. 'mass', 'force' and 'momentum' have technical meanings in physics but are also used in ordinary language). The value of the distinction is exemplified by words (like 'angels' and 'witches') that have no corresponding realities. Some savants thought there was a field of study known as alchemy, full of words that proved to be without corresponding things. Within science, there have been concepts like phlogiston that proved to be similarly empty and had to be expelled from the technical vocabulary. Just as there may be no reality corresponding to 'species', so, as will be argued later, there may be no realities corresponding to the words 'race' and 'ethnicity'.

The concept of species is a further example of the difficulties that arise because, quite apart from its use in ordinary language, there is not yet any agreement on its best use in the technical language of biology. Ernst Mayr found it vital to distinguish an essentialist conception of species from a nominalist one.¹³ He updated an older distinction between realist and nominalist definitions. An essentialist (or realist) definition seeks to grasp the most essential quality of the thing in question. A nominalist definition seeks to distinguish the thing from other things with which it might be confused. A favourite example is Aristotle's realist definition of the human being as a rational animal,

compared with the nominalist definition of that creature as a featherless biped. For some purposes, particularly in ordinary language, a realist definition may do what is required. For other purposes, particularly in scientific inquiry, only a nominalist definition will be fit for purpose.

Karl Popper, who introduced the notion of essentialism, wrote:

I use the name methodological essentialism to characterize the view, held by Plato and many of his followers, that it is the task of pure knowledge or 'science' to discover and describe the true nature of things, i.e., their hidden reality or essence. It was Plato's peculiar belief that the essence of sensible things can be found in other and more real things – in their primogenitors or Forms.¹⁴

So Plato did not problematize the relation between the thing and the word. He thought of 'forms' as things difficult to grasp. According to Popper, that relation was better addressed by methodological nominalism, an approach that searches for whatever words best describe how a thing behaves in various circumstances and studies any regularities in its behaviour.

This argument harks back to a famous passage in Immanuel Kant's *Critique of Pure Reason*:

Hitherto it has been assumed that all our knowledge must conform to objects. But all attempts to extend our knowledge of objects by establishing something in regard to them a priori, by means of concepts, have, on this assumption, ended in failure. We must therefore make trial whether we may not have more success in the tasks of metaphysics, if we suppose that objects must conform to our knowledge.

This was the basis of Kant's 'Copernican revolution' in the study of knowledge.¹⁵

The revolution can be exemplified by an analogy with the use of a grid in the construction and interpretation of maps. Coordinates are imposed on the map like a net, and the location of any point can be determined by reading off the numbers on two dimensions. Concepts are like that net. They justify their existence by the part they play in explanation. While they may also feature in ordinary language, the words that make up technical languages are subject to challenge as the growth of knowledge leads to better explanations.

The discovery that it was the gene, and not the species, that was the unit of selection forced major changes in the theoretical grid. It superseded any argument for race as a taxonomic category in the most effective of all ways, by opening the way to better explanations of biological differences. Such a path was outlined in a much-quoted article of Richard Lewontin in 1972.¹⁶ On the basis of his research, he reported that most of the variation (80–85 per cent) within human populations is found within local geographic groups and that differences attributable to so-called races are a minor part of human genetic variability (1–15 per cent). This finding does not always bear the construction that has been put upon it.¹⁷ There is now general agreement that if a great number of genetic characters are examined, statistical associations will be found to show inherited similarities shared by individuals who have a common ethnic origin, but only in very special circumstances, such as in planning the provision of medical services, are these associations of social significance.

The new knowledge contributed by research in genetics could be used, either to challenge, and possibly change, the US ordinary language conception of race, or to reinforce the original error embodied in the one-drop rule.

The Power of the Ordinary Language Construct

Eventually the US ordinary language conception of phenotypical categories will be brought into line with new scientific knowledge, but it will not easily be done because the popular conception is reinforced so strongly in daily life. A New York professor reported in 2011 that she had been required to report her race when submitting school applications, renting an apartment, getting a marriage certificate, applying for work as a college professor, being fingerprinted for government job clearance, obtaining research funding and filling out the household census form.¹⁸ The forms that have to be completed rarely provide any definition of ‘race’ or state the purpose for which this information is required. In the United States, therefore, one source of the ordinary language construct’s power is inertia. Once a classificatory procedure like this has been embedded in social institutions, an equal force has to be mobilized if it is to be changed.

When the same procedure is used for so many different purposes, confusion is inevitable. Some sort of classification is needed if patients

are to be screened for inherited diseases, such as sickle-cell anaemia, cystic fibrosis, Down syndrome and Tay-Sachs disease among Ashkenazi Jews. In 2001, because of their concern about such conditions, the American Colleges of Obstetricians and Gynaecologists and of Medical Genetics issued guidelines recommending that cystic fibrosis carrier screening be offered to Caucasian couples, including Ashkenazi Jews, if they were planning a pregnancy or seeking prenatal care.¹⁹ Such couples may well be identified in a medical setting and be interviewed by someone using guidelines that specify the social categories to be used. More serious problems arise with self-completion forms because any options they offer need to use categories familiar to those who are asked to fill in the forms.²⁰ Public controversies, like the one that led to the 2002 ASA statement, could be used to call more loudly for the updating of such modes of data collection. This would need to be based upon close consultation with data users and with those who design forms and classify responses. If the revised forms avoided use of the word 'race' and referred, as some official forms already do, to 'subgroups of the population', these new alternatives would weaken some sources of misunderstanding.

The ASA statement drew attention to differences in life expectancy, mortality and the incidence of certain health conditions (for example, African Americans had higher death rates than whites for eight of the ten leading causes of death). Access to affordable medical care also varied, as did the salubrity of residential neighbourhoods. The statement did not comment upon possible inherited susceptibilities to particular diseases.

Two years earlier, at a White House ceremony to publicize the significance of the completion of the first draft of the human genome, President Clinton had declared that 'in genetic terms, all human beings, regardless of race, are more than 99.9 per cent the same'. Craig Venter had followed with the statement that 'the concept of race has no genetic or scientific basis'. Since then, though knowledge about the genetic transmission of health conditions has been growing at an unprecedented rate, some of those involved have been slow to learn all the lessons it teaches.

Nothing illustrates the restraining power of the ordinary language construct better than the grounds on which, in 2005, the US Food and Drug Administration (FDA) 'approved BiDil, a drug for the treatment of heart failure in self-identified black patients, representing a step towards the promise of personalized medicine.'²¹ The chair of

the panel stated, 'We are using self-identified race as a surrogate for genomic-based medicine.'²² As the critics pointed out, 'self-identified black patients' would include many persons with more European than African ancestry. 'Personalized medicine' could not be based on self-identifications but would have to be based on each individual's actual genome. Some commentators deplored the licensing of the drug for a socially, not medically, defined section of the population, seeing it as a revival of 'race-based medicine' or 'racialized medicine.'²³

Variations in susceptibility to particular health conditions, like heart disease, constitute an explanandum. While it is conceivable that race, in some sense of that troublesome word, might constitute part of an explanans, some researchers have built their own conception of race into their explanandum. A leading expert on the genetics of asthma has collected thousands of genetic samples, stored by race in the his university's DNA bank, to create a database his lab team can scan for genetic clues as to what distinguishes rates of asthma in different racial and ethnic groups.

His database consisted of 24 African American, 96 Puerto Rican, 96 Mexican, 86 Caucasian and 7 Asian asthmatics. A comparison of their genomes claimed to have uncovered a relevant mutation specific 'to African origin'. The hypothesis that the condition is caused by the mutation was checked against other possible causes, while the claim that the sample was adequate to sustain a generalization about 'African origin' must be questioned.²⁴ That these and other considerations can be passed over shows how the strength of the ordinary language construct can feature in the explanandum. It does not belong there.

That construct is also built into some of the commentary on the BiDil episode. The author of a very well-documented and reasoned examination of how the FDA handled the application from a pharmaceutical company, and the possible influence of commercial interests, continually refers to the 'race-specific' presentation of this and other drugs. He gave his book the catchy title *Race in a Bottle*,²⁵ the choice of which should recall a sentence in the statement of the American Association of Physical Anthropologists that was quoted earlier. The tense in that quotation could equally well have read that 'there never has been any national, religious, linguistic or cultural group or economic class that constituted a race'. If that view of the history of science is accepted, there can be no justification for an expression like 'race-specific' or for use of the word 'race' in a book's title. What may

have appeared to be 'race' in the bottle was put there because in the United States use of the ordinary language construct in an inappropriate context occasions only feeble objection. It ignores the damage done by the recycling of a pernicious error.

The passions of the genomicists whose research has made possible the growth in knowledge about the genetics of disease figure in Catherine Bliss's book, *Race Decoded: The Genomic Fight for Social Justice*.²⁶ The reader should pause over this title also. Why does it refer to the decoding of race rather than the decoding of biological diversity or of human variability?²⁷ The author's account of her interviews suggests that the genomicists see genetic differences as their explananda. They are bitterly critical of the requirements for federal funding that require them to employ the census categories dictated by the Office of Management and Budget. The same passages also suggest that genomicists are just as much, or even more, aware of the political issues as some of the critics who express alarm about possible misconceptions and misrepresentations. The causes for concern arise most strongly in connection with the processes for granting patents to the manufacturers of pharmaceuticals and with the language manufacturers use in the pursuit of their commercial interests. It is the federal government that is primarily responsible for the misconceptions and misrepresentations, although some journalists have added to misunderstanding by oversimplifying the issues.

One concern underlying criticism of some of the current vocabulary of genomics is the possible effect that some FDA approvals and other apparently authoritative pronouncements have upon popular sentiment. To achieve a social reform in an industrialized society it is usually necessary to mobilize collective action. The effectiveness of pressure groups depends upon the readiness of potential activists to identify with a cause, and in recent times 'identity politics' have offered their supporters a means to the exercise of influence. Campaigning requires the use of ordinary language and emic constructs; the vocabulary introduced with what are sometimes called 'the new genetics' has been pictured as a tactic used to undermine identity politics.²⁸

An important article contributed to a symposium in a leading genetics journal acknowledged 'the potential for furthering racism by discussing race and genetics together', but concluded, 'Given current health disparities, however, and assuming that our society values the goal of understanding the underlying basis of those disparities, the

continued use of labels in epidemiological research and clinical practice seems justified.²⁹

Ann Morning has published the findings of her research into the question, ‘How do scientists think and teach about human differences?’ The report on her research illustrates the influence of the emic construct of race upon the mindset of the author as well as upon many of her interviewees. It shows what happens when an inquiry starts from a word instead of from an intellectual problem (in this case, that of how best to account for human differences). She asked anthropologists and biologists whether they agreed or disagreed with the statement ‘there are biological races in the species *Homo sapiens*’. That there is phenotypical variation within the species *Homo sapiens* is incontestable. Whether the word ‘race’ serves to identify that variation is the critical issue, but that issue was excluded from consideration. The anthropologists who were interviewed said that they discussed race in many contexts, some of them in connection with physical differences, some in connection with cultural or historical questions. Biologists, however, were evenly divided over whether it came within their scope.³⁰ It may be that some biologists introduced mention of race in order to contribute to their students’ general education rather than because they could not explain the biology without it.

Everything turns on the purpose for which the word is employed. Is it used in an ordinary language sense simply as a ‘label’ that designates a set of individuals, or is it a concept essential to the explanation of a theoretical puzzle? John Stuart Mill regarded the distinction between terms that only denote and concepts that connote as one of the most important distinctions in logic, and as one of those distinctions ‘which go deepest into the nature of language’. He wrote that ‘a non-connotative term is one which signifies a subject only, or an attribute only. A connotative term is one which denotes a subject and implies an attribute.’³¹

If the definition of *Homo sapiens* as a featherless biped is an example of a nominalist definition, it locates the subject in the biped category and differentiates it from other members of that category. A label is a poor relation of such a definition because it simply identifies something without necessarily placing it in any class. It does not connote anything, and its use should not be an occasion for concern.

As this chapter has demonstrated, race may be used in either an emic or an etic sense. Foxe’s reference to ‘the outward race and stocke of Abraham’ was an emic usage that denoted the descendants of Abra-

ham. If it was used to explain the plan on which God assembled his Creation, it was connotative and might therefore be a concept in the full sense of that word. In contemporary circumstances, race may be used as a label to designate a line of individuals who have inherited a specific genetic characteristic, like sickle-cell anaemia, cystic fibrosis, Tay-Sachs or haemophilia, simply because no better designation is at hand. This is the sense in which the word most often appears in the writing of Darwin and many of the next generation of biologists; it exemplifies the word's vertical dimension as opposed to the horizontal dimension employed in the racial classifications of the late nineteenth and early twentieth centuries.³² These classifications claimed explanatory value, as accounting for the history and character of a category of persons.

The distinction between two kinds of knowledge enables the reader to conclude that while race has a prominent place in the ordinary language vocabulary, it has none in the vocabulary of science. It appears nowhere in Mayr's very substantial account of the growth of biological thought. Nor does it feature in the *International Code of Zoological Nomenclature*. It is not an explanatory concept in biology, and the American Association of Physical Anthropologists issued their statement about the biological aspects of race only because the word had gained such an important place in the ordinary language vocabulary.

Sociologists can learn lessons from the history summarized in this chapter. Many discussions of the history of racial thought start from the use that has been made of the word, treating all uses as equally legitimate. This chapter has argued that it is more informative to start from a consideration of the purpose for which the word has been employed in order to examine how well it serves a purpose. It has stressed the importance of accurately identifying a problem that calls for explanation.

Sociologists can analyse the process by which the ordinary language conception has become so powerful in the United States, especially since 1865, surviving the challenges from technical language in 1909 (Johannsen), 1930 (Fisher) and 2000 (Venter). While they cannot undertake the sorts of experiments that Mendel conducted, a later chapter will contend that, like social psychologists, sociologists can design studies that will lead to observations of a standardized character, and then look to see what best accounts for their special features. They can concentrate upon the study of problems that are capable of explanation.

Notes

1. Michael Banton, 'The Vertical and Horizontal Dimensions of the Word Race', *Ethnicities* 2010 10(1): 127–140. Naomi Zack, *Philosophy of Science and Race* (New York: Routledge, 2002), 40–57, draws a distinction between vertical and horizontal models of human differences that in some respects parallels this distinction between ways in which the word 'race' has been used.
2. For Kingsley and early uses of the word in English, see Michael Banton, *The Idea of Race* (London: Tavistock, 1977).
3. Ernst Mayr, *The Growth of Biological Thought: Diversity, Evolution, and Inheritance* (Cambridge, MA: Harvard University Press, 1982), 104.
4. For the typological school, see Michael Banton, *Racial Theories*, 2nd edition (Cambridge: Cambridge University Press, 1997). For examples of the diversity in the attempts between 1864 and 1880 to give the word theoretical significance, see Michael D. Biddiss (ed.), *Images of Race* (Leicester: Leicester University Press, 1979).
5. Those who wrote about race in the mid- and late nineteenth century are sometimes described as 'race scientists'. Prichard, Morton, Nott, Smith, Knox and Vogt were medical doctors; Gliddon and Gobineau had no academic qualifications. Apart from Cuvier, few were engaged full-time in anything resembling science as this word is understood in the twenty-first century, so this and similar expressions, such as 'scientific racism', can convey a misleading impression.
6. Mayr, *The Growth of Biological Thought*, 267.
7. Quotations from Chapter VII of *The Descent of Man, and Selection in Relation to Sex*, 1871, forming part of Edward O. Wilson, ed., *From So Simple A Beginning. The Four Great Books of Charles Darwin* (New York: Norton, 2006), pp. 905–910. Amidst the impressive literature on Darwin's reasoning, a special place should be reserved for a book by a great-great-grandson of his, Randal Keynes, *Annie's Box. Charles Darwin, his Daughter and Human Evolution* (London: Fourth Estate, 2001).
8. Wilhelm Johannsen, *Elemente der Exakten Erblichkeitslehre* (Jena: Gustav Fischer, 1909).
9. William B. Provine, *The Origins of Theoretical Population Genetics* (Chicago: University of Chicago Press, 1971). For informative accounts of the personalities of R. A. Fisher, J. B. S. Haldane, and some other leading biologists, see Marek Kohn, *A Reason for Everything: Natural Selection and the English Imagination* (London: Faber, 2004).
10. Elazar Barkan, *The Retreat of Scientific Racism: Changing concepts of race in Britain and the United States between two world wars* (Cambridge: Cambridge University Press, 1992), pp. 285–296. Barkan's book offers an admirable account of its subject matter, a series of failed explanantia. In contrast, the present book attempts to start from the social significance of phenotypical characteristics as an explanandum.
11. UNESCO, *The Race Concept* (Paris: UNESCO, 1953), pp. 34–65. Also, Michael Banton, *The International Politics of Race* (Cambridge: Polity, 2002), pp. 28–38.

12. Marek Kohn, *The Race Gallery. The Return of Racial Science* (London: Cape, 1995).
13. Mayr, op.cit. pp. 256–265.
14. Karl R. Popper, *The Poverty of Historicism* (London: Routledge, 1957), pp. 26–34.
15. For an earlier discussion, see Michael Banton, ‘Epistemological Assumptions in the Study of Racial Differentiation’ in John Rex and David Mason, editors, *Theories of Race and Ethnic Relations* (Cambridge: Cambridge University Press, 1986), pp. 42–63.
16. Richard Lewontin, ‘The Apportionment of Human Diversity,’ *Evolutionary Biology* 1972 6: 391–398.
17. The importance of genetical differences within as well as between continental populations is highlighted in Nicholas Wade, *A Troublesome Inheritance: Genes, Race, Genes, Race and Human History*, 2014 New York: Penguin. He writes of ‘the fact of race’ as if the popular US conception were the explanandum. Had he separated practical and theoretical knowledge, his case would have been stronger.
18. Ann Morning, *The Nature of Race: How Scientists Think and Teach About Human Difference* (Berkeley: University of California Press, 2011), p. 2.
19. For speculations about the possible causes of Jewish success in certain fields, and of Jewish susceptibility to certain specific diseases, see Wade, op. cit., pp. 198–214.
20. Peter J. Aspinall, ‘When is the Use of Race/Ethnicity Appropriate in Risk Assessment Tools for Preconceptual or Antenatal Genetic Screening and How should it be Used?’ *Sociology*, 2013 47(5): 957–975.
21. Dorothy Roberts, *Fatal Invention: How Science, Politics and Big Business Re-Crete Race in the Twenty-first Century* (New York: New Press, 2011), p. 165.
22. Jonathan Kahn, *Race in a Bottle: The Story of BiDiL and Racialized Medicine in a Post-Genomic Age* (New York: Columbia University Press, 2012), p. 163.
23. On the use of ‘racialization’, see Karim Murji & John Solomos, eds., *Racialization: Studies in Theory and Practice* (Cambridge: Cambridge University Press, 2005), pp. 1–27, 51–68.
24. See Roberts, op. cit., pp. 109–111.
25. Kahn, *ibid.*
26. Catherine Bliss, *Race Decoded: The Genomic Fight for Social Justice* (Stanford: Stanford University Press, 2012)
27. ‘The scientists I spoke with suggest that they are getting closer to a solution and thus require more investment in research that will shed light on the true nature of human variation.’ This may be contrasted with the author’s statement ‘I view race as a belief system...’ *Ibid.* pp. 11–12, 14. At the present time, *Race Decoded* is important reading for anyone interested in recent developments. Some of the references to ‘race as ancestry’ and to ‘race as a stratifying practice’ (p. 85) parallel what has been written above about the vertical and horizontal meanings given to the word.
28. Catherine Bliss, ‘The Marketization of Identity Politics,’ *Sociology*, 2013 47(5): 1011–1; Katharina Schramm, David Skinner & Richard Rottenburg, eds., *Identity Politics and the New Genetics* (New York: Berghahn, 2012).

29. Joanna L. Mountain & Neil Risch, 'Assessing genetic contributions to phenotypic differences among 'racial' and 'ethnic' groups,' *Nature Genetics* 2004 36(11) S48–53.
30. Ann Morning, op. cit., pp. 138–141. For an update, see her 'And you thought we had moved beyond all that,' 2014 37(10): 1676–1685.
31. John Stuart Mill, *A System of Logic: Ratiocinative and Inductive* (London, originally 1843), Book 1, Chapter II, section 5.
32. See Provine, op. cit., pp. 131–132, and the reference to Mendel as starting with a population of peas 'formed by the hybridization of races AA and aa'; it is followed by the statistician G. Udney Yule's question about what happens if 'the two races A and a are left to themselves.' These are examples of the use of a name, race, simply to denote a subject and not to make any meaningful statement about how the subject fits into any explanatory scheme.