Genetic Non-Science

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According to media news, the cabinet of the Government of India has rejected a proposal to hold caste census. Which is an eminently sensible decision, for such a census is pointless when the concept of caste itself is debatable. Meanwhile, in the name of genetic science some dubious research on caste is being reported in India and abroad. Below is an example, with our commentary. Also, like the traditional abuse of horoscope reading and fortune telling, genetic profile making is susceptible to become a suspicious commercial business. The matter calls for scrutiny by the scientists and probe by the government.

An international (Estonia, India, UK, US) team of geneticists has claimed to have proved that the "origins of Indian caste populations" lie in their genetics. The title of its report is, "Genetic Evidence on the Origins of Indian Caste Populations" (Bamshad, 2001). The sample of the study consists of 265 males from eight different caste populations from one state of southern India. Its conclusion is as follows. "Indian castes are most likely to be of proto-Asian origin with West Eurasian admixture *resulting in rank-related* and sex-specific differences in the genetic affinities of castes to Asians and Europeans" (italics added). The team compared two genetic features, mtDNA and Y-chromosome, of this sample with those of 400 individuals from tribal and Hindi-speaking caste populations distributed across the Indian subcontinent and 350 Africans, Asians and Europeans.

With reference to the European Y-chromosome, the distance is found to be lower for the upper castes, than for the lower castes, in the state sample. The team considers this distance to be a piece of "genetic evidence" of upper-ness of upper castes. It is evidently aware of multivariate influence upon genetic features — geography, profession, nutrition, culture, and so on. It has recognized earlier research as follows: "Previous genetic studies of Indian castes have failed to achieve a consensus on Indian origins and affinities. Various results have supported closer affinity of Indian castes either with Europeans or with Asians, and several factors underlie this inconsistency. First, erratic or limited sampling of populations has limited inferences about the relationship between caste and continental population (i.e. Africans, Asians, and Europeans). These relations are further confounded by the wide geographic dispersal of caste populations. Genetic affinities among caste populations are, in part, inversely correlated with the geographic distance between them... and it is likely that affinities between caste and continental populations are also geographically dependent. ... Second, ... castes of different rank may have originated from or admixed with different continental groups. Third, the size of caste populations varies widely, and the effects of genetic drift on some small, geographically isolated castes may have been substantial." Yet it proceeded to conclude that Y-chromosome caused caste-ranking.

The hypothesis of the team's study is a composite of three parts, namely, (a) Y-chromosome causes caste, (b) European Y-chromosome has produced "Indian caste populations", and (c) European Y-chromosome has produced the upper-ness of upper castes. The study has not been able to prove any of these. Its conclusion is, therefore, false.

If Y-chromosome produces caste, castes would have been there all over the world. If the European Y-chromosome produces upper castes, all of Europe must have upper castes alone. How would Europe live without lower castes?

Oppenheimer (2006), a medical geneticist at the University of Oxford, has found evidence to the effect that the principal ancestors of today's British and Irish populations arrived from Spain about 16,000 years ago. Others such as Angles, Celts, Normans, Romans, Saxons, came later in much smaller numbers. The Norman invasion of 1066, for instance, brought not more than 10,000 people.

If the people of the British Isles hold most of their genetic heritage in common, with their differences consisting of only a regional flavoring of Celtic in the west and of northern European in the east, might that perception draw them together? Geneticists see little prospect that their findings will reduce cultural and political differences. The Celtic cultural myth "is very entrenched and has a lot to do with the Scottish, Welsh and Irish identity; their main identifying feature is that they are not English," said Bryan Sykes, another Oxford geneticist. Genes "have no bearing on cultural history", said Oppenheimer. There is no significant genetic difference between the people of Northern Ireland, yet they have been fighting with each other for 400 years. As for his thesis that the British and Irish are genetically much alike, Oppenheimer continued, "it would be wonderful if it improves relations, but I somehow think that it won't" (Wade, 2007).

Genetics has little to do with culture or history. Nobel laureate for his co-discovery (with Francis Crick) of DNA double-helix, Watson (2004) stresses the distinction between genetic heredity and subsequent development of personhood. Early biologists had several false starts about genetics. "Perhaps the most important was the failure by early biologists to distinguish between two fundamentally different processes, heredity and development. Today we understand that a fertilized egg contains the genetic information, contributed by both parents, that determines whether someone will be afflicted with, say, porophyria. That is heredity. The subsequent process, the *development* of a new individual from that humble starting point of a single cell, the fertilized egg, involves implementing that information. Broken down in terms of academic discipline, genetics focuses on the information and developmental biology focuses on the use of that information. Lumping heredity and development together into a single phenomenon, early scientists never asked the questions that might have steered them toward the secret of heredity" (italics in the original). Caste is a social relation, a historical phenomenon. Genetics does not cause it.

In 1801, Jean-Baptiste Lamarck published his theory of inheritance of acquired characteristics, erroneously suggesting that traits acquired during an individual's lifetime could be passed on to its offspring. Darwin, in 1859, argued that any change that occurred in an individual after birth, like the stretch of a giraffe's neck imparted by craning for the highest foliage, could be passed on to the next generation. Ironically then, to buttress his theory of natural selection Darwin came to champion aspects of Lamarck's theory of inheritance of acquired characteristics, the very theory that his evolutionary ideas did so much to discredit. Darwin was invoking only Lamarck's theory of inheritance. But he continued to believe that natural selection — the process of frequent and ubiquitous chance mutations and nature's selection of only those mutations which improve reproductive capacity of the species, over a long stretch of time — was the driving force behind evolution. This process operates through changes in chromosome. So here was an inconsistency in Darwin's arguments, for characteristics acquired by an individual do not enter its chromosome, so cannot

participate in Darwin's process of natural selection. Nobel laureate in physics, Schrodinger (1988) has resolved Darwin's anomaly as follows.

Schrodinger writes: "even when rejecting the inheritance of acquired characteristics, in other words accepting Darwin's theory of evolution, we find the behaviour of the individuals of a species having a very significant influence on the trend of evolution, thus feigning a sort of sham-Lamarckism." To avoid vagueness, let us think of an organ, but the feature in question might be any property, habit, device, or behaviour. Lamarck thought that the organ (a) is used, (b) is thus improved, and (c) the improvement is transmitted to the offspring. This is wrong, Schrodinger insists. By contrast, in Darwin, the organ (a) undergoes chance variations, (b) the profitably used ones are accumulated or at least accentuated by natural selection, (c) this continues from generation to generation, the selected mutations constituting a lasting improvement. Once an organ has a chance mutation, the individual's behaviour changes; he uses that organ. One cannot simply possess clever hands without using them for obtaining one's aims; one cannot have efficient wings without attempting to fly.

Once an organ gets improved through use, the direction of natural selection would move in its favour. Out of all subsequent random mutations, those which are compatible and complementary to it would have greater probability to be selected. "We must, of course, not think that 'behaviour' after all gradually intrudes into the chromosome structure and acquires a 'loci' there. It is the new organs themselves (and they do become genetically fixed) that carry along with them the habit and the way of using them. [Natural] selection will be powerless in 'producing' a new organ if selection were not aided all along by the organism's making appropriate use of it. And this is very essential. For thus, the two things go quite parallel and are ultimately, or indeed at every stage, fixed genetically as one thing: a used organ — as if Lamarck were right." This conclusion may be put as follows.

Danvin-Lamarckism (Schrodinger Theorem) : "The behaviour changes parallel those of the physique, first as a chance change in the latter, but very soon directing the further selectional mechanism into definite channels. Behaviour and physique merge into one."

Those tribals who were driven ruthlessly into the crown villages of Maurya Empire (320-200 BC) or those artisans who were herded into the self-sufficient villages of Gupta Empire (AD 320-500), lulled by Manu's codes (Kosambi, 1970), did not originally have any inherent caste-making genes in them, but would emerge, centuries later, with their chromosome perfectly fitting their very castes, which were assigned to them by external forces in the first place. Caste had created the resulting chromosome, not conversely.

It is germane to the context to remember Kosambi (1975): "the whole concept of race as based upon skeletal measurements, hair-colour, skin-pigmentation, colour of eyes, is regarded as of doubtful genetic validity. ... Skull form, nasal-index measurements are not applicable to grave remains. Both vary within a few generations if living conditions should change, and vary from class to class within a class society." The social history of India as well as of British Isles confirms Schrodinger's theorem and Kosambi's comments. Genetics is a powerful source of knowledge, but it is a double-edged sword. Used or abused by inept or able hands, the genetic jinn, once awaken, may turn destructive.

This dilemma brings to mind the ancient Greek belief that three Fates measured out the length of each human life, and that oracles foretold the future. But the predictions of the oracle were rarely either simple, or what was sought. Misinterpretation is always a danger. The Oracle at Delphi predicted that Oedipus would kill his father and marry his mother. Oedipus thought he could escape this destiny. But in the end, he willingly performed both these acts, without knowing at the time that he was doing so.

Herodotus tells of King Croesus in Asia Minor, who, when consulting an oracle, was told that if he mounted an invasion, a mighty empire would fall. He attacked, and in the end, as Herodotus writes, "the Oracle was fulfilled, Croesus had destroyed a mighty empire — his own." Since the Renaissance, literature and art have presented the Greek fates ambiguously, either as divine beings fulfilling the work of God or old hags mercilessly dashing human hopes. As science progresses, as more genes are found, their meaning uncertain, we will get information that we don't want to know and don't know how to use. We have much to learn from the Greeks: to be cautious in interpreting prognostications, to beware that genetic information, like oracles, may offer an illusion of certainty. This paragraph draws upon the article of Dr. Robert Klitzman, M.D. □□□

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