

Body and biology

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Abstract

The social community is neither a mosaic nor a sum of different identities but something akin to a new, compound being, characterised by its own genome: the mfDNA. It involves, in particular, a kind of colonisation, the outcome of events, contingencies, probabilistic dynamics, interrelationships between the individual (or society) and the environment. Furthermore, community does not imply a mere list of species but a milieu that exists to serve their relative, not simply single and bi-univocal representations and interrelationships, acting within a complex multifactorial network characterized by a preliminary mathematical-model approach. Therefore, it is possible to introduce a new perspective, driven by the mfDNA approach and biology, and suggest a wider context capable of improving our understanding of the role of individuals within societies. We propose a new tool, the “social mfDNA model”, as an interior indicator of the properties, composition and dynamics of human society.

Keywords: body; biology; microflora; DNA.

Generally speaking, scientific knowledge regarding the reality assumes prevalently mono-disciplinary forms. Inter-disciplinary analytical endeavours are rather rare and, more often than not, they encounter contestation, reluctance and criticism, aimed mostly at matters of content and methodology. It is difficult, however, to deny that the presence of differentiated perspectives can bestow greater trustworthiness on results. If anything, the critical issue is how to overcome the diffidence which prevents scholars from remaining open to confrontation with ambits outside of their usual areas of competence and questioning the *know how* they already possess. Undoubtedly the inter-disciplinary choice will not be of interest to scholars who retain that their own is the only truly rigorous, correct and serious discipline. A physicist, for example, who does not consider ethology truly worthy of the epithet scientific, will find it even more difficult to emerge from his/her shell and venture into the flexible area of fuzzy sciences like sociology or psychology.

To tell the truth, previous operative attempts have been made to conjugate, for example, biology and sociology, and these have produced mixed solutions, like those advanced by socio-biologists like E. O. Wilson (1975), S. S. Acquaviva (1983), A. S. Franklin (2002), T. Newton (2003). But the meagre results of these attempts need not act as a barrier to ulterior proposals of inter-disciplinary collaboration between sociology and biology (in different terms and with a more open mind) concerning the development

of areas of convergence and divergence, the latter due to limitations typical of the human subject. One may refer, for example, to cases of the so-called exact sciences being inspired by sociological methodologies (for example phyto-sociology, which studies communities of vegetables that emerge spontaneously in nature) or ethnobotany (which studies relationships between plants and humans).

A newborn baby receives a special type of *imprinting* due to its mother's bacterial flora¹. This initial "contamination" is implemented by the vagina. The baby is delivered after a number of hours' contact with the mother's vaginal canal. In the case of delivery unhindered by technological intervention, the mother, immediately after birth, brings her baby spontaneously to her breast, not to feed it but to look at it. This is a profound kind of contact, caused by a specific endorphin hormonal *cocktail* to which mother and child are subject during this phase: this process is called *bonding*.

When child is born he is composed only of his own cells (there is, however, a subsequent transmission of maternal bacterial flora, after birth, however). The immune system is not yet active and, therefore, the individual is open to acquisition of many elements coming from without. And so, various microorganisms begin to develop on and in the child's body, beginning with the more easily reachable external parts (paradoxically some of the less accessible and sterile inner tissues are more malleable) due to exterior, heteroclitic impact. In actual fact, the human child, from the moment of its conception begins a relationship with another subject: its mother. When, later, after delivery, when the neonate comes into contact with the external environment, a number of areas of its body are invaded by microbes. But, at the same time, its brain too, that is, its mental apparatus begins to receive and assimilate new messages, *inputs*. Their characteristics, like those of microbes, protozoans, fungi, and viruses (which are not cells), do not differ substantially from one another, seeing that their structures are quite similar. A kind of symbiosis is built up slowly and gradually between the newborn's body and the microflora of the environment; but between it and the voices, tones and gestures of the others belonging to the social milieu, another kind of symbiosis emerges too. It is by no chance that one speaks of symbiotic bacteria which co-evolve with the human bodies that are the seat of their engraftment. Analogously, one may also consider the infant-mother and the adult-child bonds as symbiotic. This kind of ever-growing symbiosis ensures that the *link* thus established become increasingly mutual and imitative, something extremely useful during the early learning and socialisation phases of development. One must consider the fact, however, that it is not so much a question of one type of microorganism as of a microfloral milieu (micro meaning small but also microbic) colonising various parts of the body. The same may be said of human relations during the early stages of life: a striking compound of interpersonal, linguistic and behavioural exchanges take place, together with habits

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that begin to crystallise and consolidate to become a kind of bedrock which will be very difficult to undermine or change later on in life. The same is true of and regards every sphere of the surrounding environment on the whole. This is true, for example, of natural biodegrading processes where pollutants trigger off series of procedures on the part of microbes, protozoans, minuscule worms and other tiny metazoans, which transform them into polluted liquids and purify them: which is exactly what happens to fluvial sediment or the active sludge treated by urban waste purification plants. In these environments, too, what might be deemed a microfloral community, classifiable as the genome of those particular contexts, springs into action.

At human level, transformations occur as the result of a number of key-interventions which bestow direction on the life of an individual, causing him/her to change course due to conviction or as the result of conscious and autonomous choice, although, later on, it is not possible to establish what the results of a presumably significant influence may be. Something similar happens when microflora digests a pollutant, before re-releasing the decomposed matter (even in the form of gas) into the environment. To this regard it is possible to speak of plagiarism or enforced education.

It should be noted that specific microfloral elements are capable of adapting themselves to some very peculiar environments and combine, for example, with volcanic or sulphurous contexts. It is important to keep in mind, however, that outside of certain environments and ecological niches some microfloral components would be unable to survive. The opposite also holds because the microflora in and on our bodies would be unable to resist in volcanic or sulphurous conditions.

Therefore, one can say that microfloral elements are endowed with a specific and well-known degree of both adaptability and complexity. The microflora of the oral cavity differs from that of the mouth and that of the faeces (of which it is a relevant component, weighing about one fifth of the whole). Its structure, however, is extremely diversified and, in this, might be compared to complex and differentiated social communities. In the case of human society, variability is even more far-reaching and varied and presents characteristics shared by a given group, but also found in distant and not necessarily similar contexts. Above all, one trait of human society needs to be underlined explicitly and clearly: the society of people is always associative and collective, with a constituent and distinctive profile of its own.

It must be pointed out that society on the whole, like microflora, is no mere mosaic comprising many tesserae but a structure in its own right, enclosed, one might say, in a particular environment necessary to its effective functioning. However, the components of the structure do not remain confined forever within this reference frame, but may be expelled, ousted, ejected (as is the case when one coughs, blows one's nose, salivates, etc.). The tiny structural parts will stay in their niche, carry out

their functions and grow together. Similarly, a given social group will remain within a given territory, characterise, define, colonise and transform it.

Now, if a sole element is expelled from the microfloral or social community as described here, there is no guarantee that it will be able to grow elsewhere. On the other hand, the subtraction of even a sole element may trigger off the decline of all the other members of a microfloral colony, of a social group, of a community group. During purification processes, like that of the biodegradation of pollutants present in water, many transformations occur which lead, eventually, to the creation of a series of final products due to the biodegrading process itself. Following a similar kind of general procedure, one might say that in the case of human societies too, change gives rise to something different, day after day, even if continuity with the past is never broken. In other words, social companies never repudiate their identity completely but proceed by degrees, slowly, building on the pre-existent.

Variation within the microfloral milieu can lead to pathology. For example, an excessive quantity of a given microfloral element in the mouth can cause periodontal disease. If a single component develops too much, this imbalance will alter the microenvironment of all the other elements, so that the person whose mouth hosts this altered microflora will suffer pain and discomfort. It may also occur that, in the absence of one element, all the others may readjust. In brief, the members of a microfloral community are inter-related and the imbalances produced impact on the host, on the ecological niche, on the surrounding environment, bi-univocally. This is exactly what one finds in human social groups or communities. The “suffering”, the discomfort, of a single member has an impact on the rest of the group, so that consequences, changes and effects of all kinds are produced. If a social actor wields excessive power, this fact produces change within the relative social framework. All the other members of the group perceive this power as authoritarian and as an imposition, different, in any case, from the normal flow of the social “fluid”, that is, of the social lymph, the “amniotic” liquid, which guarantees the survival of all social beings.

At this point we may refer to Craig Venter’s examination of the microorganisms present in the Sargasso Sea (Venter *et alii* 2004), where the microflora presents an amazing morphological, genetic and functional variety of microbic species, as found, besides, in other natural matrices, like soil, water, debris. But the Sargasso Sea would not possess the singular characteristics it does without its particular microflora, taken as a dynamic whole, like other microfloral complexes

Some fluids, however, in order to avoid serious danger, need to be sterile, like cerebrospinal fluid or sperm and even blood itself; all of these are devoid of microflora, at least when the body enjoys normal good health.

From this it may be deduced that it is not useful to consider single elements independently of all the others, but that it is necessary to focus on the community as a whole. In other words, it is opportune to study the group in order to grasp the relationships existing between the individual and the community as well as between the group and its single members.

The coincidence between body fluids and the liquid society is truly singular; no mere fluke in Baumanian (Bauman 2000, 2003) terms. This coincidence is accentuated by the contingent contemporary situation, which witnesses the liquefaction of the solid structures of the past. Lack of employment, the end of job security and the increased mobility of individuals, due to globalisation processes, have created conditions favouring unwanted and persisting flexibility (for the moment, at least). The individual and the social are interlinked more, perhaps, than ever before, just like the DNA microflora clings almost inextricably to the human body. But an unexpected event may cancel a job, creating instability; in the same way, the action of a human being and/or of an external, environmental biological factor can undermine the bond existing between a DNA microfloral reality and the body that hosts it.

What is most intriguing is, however, the fact that the ejection of even a sole microbe from its community produces effects that cannot be underestimated. One needs, of course, to discover the reasons for the separation, the motives, the independent variable that favoured it.

The theory of situational determinism advanced by Lucy Suchman (1987), with its "situated cognition" and "situated action", considers the environment as a part of the cognitive and operative process; it holds that knowing is linked to doing and belongs to social, cultural and physical frameworks. It is a fact, however, that today there is a marked tendency to come to terms with a kind of modernity where no solid, tendentially static, protective, sheltering, safeguarding haven exists any longer. In actual fact, we are now obliged to renounce many certainties and allow ourselves to be assailed by myriad existential worries of all kinds. The stabilisation of a community is no longer a given. Work placement is an increasingly recurring worry. Bankruptcy and redundancy loom on the horizon which draws closer and closer. The socio-economic crunch is no longer a marginal issue that concerns only the few. Instability and flexibility are practically the norm fixed in time and space. All told, as Bauman writes, jobs in consolidated workplaces appear today as a memory from the past; no special skills or experiences exist which, once acquired, are capable of guaranteeing a permanent and, above all, lifetime job (Bauman 2000: 161). The same may be said of the liquid elements present in some of the body's cavities: they are not guaranteed to last in time, exposed as they are to environmental degradation, to interaction with others and with other bacterial communities which come into contact with the oral, intestinal and vaginal mucous areas of the body. These biological fluids,

once they enter the environment, are subject to ulterior modification, caused by various agents including other microorganisms. The *microbial signature* determined by residues of mfDNA does not last very long either and yet, although no longer vital, it can, nonetheless, permit us to recognise its origin. This is true too of social individuals, whose origins are hard to conceal for various reasons (from the language they speak to the colour of their skin, from their somatic traits to their cultural attitudes and behaviour). Vestiges of ancient civilizations, documents, ruins and architectural remains, which survive the ravages of time and destruction, tell far more than the story of their specific original function, reflecting, as they do, the complexity, history and roots of the society that produced them. Similar information is by no means static, therefore, but its traces assume a dynamic and complex significance in the light of the original texture that gave birth to it.

The liquid form is also the means by which to escape from the solidity of power, however it may be expressed, and enter mobility, flexibility and free circulation. Post-modern liquid society seems to provide increasingly broader degrees and ranges of freedom, though instability weakens existing bonds. And that is now membership of communities dwindles and leads to the affirmation of individuals without ties.

In more explicit terms, Bauman holds that solidity is a curse, as is the case with every other form of persistence, because the latter is a sign of dangerous inability to adapt to a world which changes in rapid and unforeseeable manner, to the opportunities it unexpectedly offers and to the speed at which yesterday's resources become tomorrow's burden (Bauman 2001: 231). In reality, what the idea of individualisation brings with it is emancipation from the unwritten, inherited determinism innate to its social character (Bauman 2001: 144). The individual can no longer count on a haven in which to seek refuge. There is no further security.

Finally, one position from which to study the organization of human societies (Donaldson 2001) might be that provided by the mfDNA approach which is used for analysis of microbial communities. According to this perspective, the community is neither a mosaic nor a sum of different identities but something akin to a new, compound being, characterised by its own genome: the mfDNA. It involves, in particular, a kind of colonisation, the outcome of events, contingencies, probabilistic dynamics, interrelationships between the individual (or society) and the environment.

Furthermore, community does not imply a mere list of species but a milieu that exists to serve their relative, not simply single and bi-univocal representations and interrelationships, acting within a complex multifactorial network characterized by a preliminary mathematical-model approach.

In conclusion, it is possible to introduce a new perspective, driven by the mfDNA approach and biology, and suggest a wider context capable of improving our

understanding of the role of individuals within societies. We propose a new tool, the “social mfDNA model”, as an interior indicator of the properties, composition and dynamics of human society.

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