

To connect or not to connect. Is that the question?

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Life Matters

The current oxygen content of the earth's atmosphere has been relatively stable at around 21% for almost 600 million years. This is principally determined and rendered sustainable by the connections and the interactions between producer and consumer organisms within the carbon cycle and is fundamental for most forms of life, including that of human beings. In a state of hypoxia, death or permanent cerebral damage can take just a few minutes. Even the most basic functions of the brain are unsustainable without oxygen. If one human being cries "I can't breathe!", then this is the most dramatic call for help possible, to which any other human being in a position to do so should respond with all available means.

Medical staff act to save lives as an existential (and ethical) imperative (for themselves and those they treat) through the spontaneous and reflexive exercise of the competences they have developed during their professional practice and learning. Others can try to intervene spontaneously by drawing on previous experiences that, within certain limits, may assist someone in need. In all cases, being human should mean connecting with each other by acting and interacting to do one's utmost to recreate the conditions necessary for the sustainability of life as such, and most particularly when it is in danger.

In recent weeks we have all witnessed an atrocious paradox. Tens of thousands of nurses and doctors the world over have given and continue to give their all (including their own lives) to help fellow human beings counteract the potentially devastating consequences of COVID-19, a previously unknown viral infection causing a severe acute respiratory disease that can lead to hypoxia. At the same time, our

attention has also been captured by an episode in which a number of police officers have deliberately caused a state of hypoxia in another human being and ignored or indeed impeded all pleas or attempts to help him.

On the one hand, we could say that such a contrast defies imagination. Yet on the other, it renders with overwhelming clarity a vision of the immense contradictions that characterize humanity, its behaviours, its societies and its evolution as a species. These contradictions are part of a wider framework of connection and interdependence that form the very fabric of our lives, as of all life. If at times there is the need to cry out that “black lives matter”, this is because all lives matter and all life matters, without discrimination. If at times there is the need to repeat that “if you hurt one, you hurt all”, this is also because damage to life anywhere is damage to life everywhere.

Webs of connections and intersecting spheres

Like that of all species, the evolution of *Homo sapiens* has taken place – and continues to do so – within multiple webs of connections that, in turn, are both within and between intersecting spheres. The biosphere is the theatre in which constantly shifting planetary and eco-systemic connections give rise to – and are impacted by – interactions between us and all the other biotic and abiotic elements that are present. This in turn can lead to all-pervasive outcomes such as climate change and biodiversity loss and the cascading catastrophic consequences of these phenomena. The resourcesphere is the stage we have constructed on which our social and economic connections have given rise to highly complex, often uncontrolled and potentially explosive interactions between different forms of what is commonly called capital – natural, produced, human, financial and social – as well as manifest and multiple levels of imbalance, inequity and injustice as regards the distribution, the use and the availability of each of these. Both the noosphere and the infosphere are platforms we have created on which scientific and technological connections have given rise to a massive expansion in knowledge building and sharing – as well as the recognition of its limits – together with increasingly rapid digital innovations that continue to transform and frequently, although not necessarily, distort both our communication flows and our processes of production and consumption.

Since the beginning of 2020 all humanity has found itself in the middle of the dramatic COVID-19 pandemic, an extra-ordinary period of e-mergency (*e-mergere*: “come to the surface”, “let what was hidden be seen”), in which a minute biological entity - Sars-CoV-2 – has laid bare all the fragility of humanity’s current dominant structures and trajectories. In the words of Partha Dasgupta and Inger Andersen, in an article published by *The Independent* newspaper on the occasion of World Environment Day 2020, “COVID-19 is nature sending us a message. In fact, it reads like an SOS signal for the human enterprise, bringing into sharp focus the need to live within the planet’s means. The environmental, health and economic consequences of failing to do so are disastrous” (Dasgupta & Andersen, 2020).

At the same time, it is fundamental to recognize that nature’s message is for one of its own parts – we human beings. Nature is not something external to us that periodically invests us with perturbations, disasters and destruction that we should be able to interpret as messages it sends us, while at other times we can indifferently continue to exploit it for our own supposed benefit, extracting its resources and poisoning it with our waste. In the same way, the proliferation of pathogens like viruses is not just something that has happened to us. It has been significantly increased by human activity such as farming, transport, complex trade links and our congregation in dense cities. While economic models may separate the concepts of natural and produced capital for the purposes of analysis, these are in fact both inextricably entangled parts of cyclical feedback loops that we must incorporate into our ways of thinking and being – both as intelligent understanding of and intelligent action in the world we inhabit. This fact should induce in us above all a profound and wide-reaching reflection on ourselves first and foremost as natural natives (whether we were born before or after the advent of digital technology) in terms of our connections to and interactions with nature, the place (*oikos*) where all of us are born and that sustains our lives and all life. It is by now abundantly clear that all the crises that today most occupy our attention – climate change, loss of biodiversity, a virally-induced health crisis – are interconnected. This is because everything is systemic, in that every part of our world and everything that happens there is related to, affects and is affected by every other part and everything that happens there. Recognition of this means that all our thinking has to be systemic and thereby in-formed by the awareness this vision brings and the ensuing action it should guide.

Imbalance and inequity, inequality and injustice

It has long been recognized that human activities cause changes in the Earth's atmosphere in the quantities of greenhouse gases or aerosols that, in turn, contribute to climate change. The largest known contribution still comes from the burning of fossil fuels and the subsequent release of CO₂. Wherever this is emitted, it then travels everywhere through the air and causes global warming that invests the whole planet. There has also been growing recognition that the loss of biodiversity leads to a breakdown in the functioning of interdependent ecosystems and the roles played within them by different species in terms of ecosystem productivity and services, once again with planetary consequences. Only more recently, we have also come to understand how biodiversity loss, such as that caused by the destruction of rainforest, can give rise to the emergence of viruses hitherto confined to a particular habitat, but which possess an equal capacity to rapidly spread over the entire earth once they pass from one habitat to another and from one living organism to another. Coronavirus is a formidable example of networking which connects people with a disarming and literally pandemic efficiency, using the very people it infects to infect others as they come into contact and thereby accelerating its own process of self-replication. This process generates a dramatic health crisis but also reveals the imbalance and inequity that characterizes the majority of inter-human connections and the extent to which social and economic structures determine health outcomes. In the words of Michelle Bachelet, UN High Commissioner for Human Rights, "this virus is exposing endemic inequalities that have too long been ignored. In the United States, protests triggered by the killing of George Floyd are highlighting not only police violence against people of colour, but also inequalities in health, education, employment and endemic racial discrimination". Moreover, "the fight against this pandemic cannot be won if Governments refuse to acknowledge the blatant inequalities that the virus is bringing to the fore". Efforts to come to terms with COVID-19 and to begin what many are calling the recovery process must necessarily be founded on an attempt to create a society in which "everyone's rights to life and health are protected without discrimination" (OHCR, 2020).

As the rapid spread of pandemic contagion has covered all continents, many examples have emerged of human vulnerability and how this is exacerbated by inequality and injustice. A particularly striking example is that of the New York Times front page on May 24, which, for the first time in over 40 years, contains no photographs. Beneath the title "US deaths near 100.000. An incalculable loss.", readers find 1.000 short obituaries, representing only a tiny fraction of the total list victims in the US during the outbreak so far, thereby personalizing the tragedy in an endeavour to go beyond the inevitable data fatigue caused by daily reporting of the pandemic in terms of the official tolls, which are in turn almost certainly a gross undercount of the real numbers involved.

These deaths were the result of a political administration (by no means the only one in many different parts of the world) minimizing the importance of the pandemic and pretending that the virus would not reach or have any great impact on the most powerful nation of the world. Such a denial was a gross betrayal of the belief that all human beings should be able to share and place in those that have the responsibility for administering their lives as members of any society. All their stories are equally worthy of attention and, as time has passed, every New Yorker has many to tell, of neighbours, parents, spouses, partners and even children who died even within 48 hours of each other, colleagues, restaurant and shop owners, supermarket sales personnel and acquaintances from all walks of life. The pandemic exploded in the midst of total unawareness and unpreparedness, and – as the NYT editor remarks – "the 1.000 stories here reflect only 1% of the toll. None were mere numbers, they were us" (New York Times, 2020).

Moreover, there is a wider and even more devastating truth that is revealed by these numbers and these stories. The number of Afro-Americans and Latinos in New York hospitals has much higher than the number of white Americans, although they represent smaller percentages of the population and their death rate has been reported as more than twice that of other groups (Mays & Newman, 2020). The Bronx and Queens are the worst hit areas, as well as being the poorest ones. While neoliberal economic doctrine has continued to claim that the unfettered market and unbridled private enterprise will generate wealth capable of providing equity and equality for all, one New Yorker in four can manage to feed themselves only thanks to the help given by volunteers, such as the Food Bank for New York City. This agency was founded in 1983, in the heyday of Reaganomics and, long before the arrival of the current pandemic, it had found it necessary to build a network with 1.200 emergency suppliers, able to provide around 400.000 free meals every day to people living practically next to Wall Street and Times Square,

close to the gaze of the Statue of Liberty, not in slums or shanty towns dotted all over the world. Bad economics leads to bad health, wherever this takes place, and health is what most clearly reflects inequality and injustice. This is true at both macro- and micro-economic levels, as the profitability imperative has in recent decades led to an imbalance in research and development in terms of the concentration on chronic, non-transmittable illnesses at the expense of infective illnesses.

Furthermore, “the current public health and economic crisis far surpasses the personal, psychological, and economic devastation wrought by 9/11, the 2008-09 Great Recession, or Superstorm Sandy”, while “job losses and new unemployment claims that have mounted since the beginning of the pandemic are unprecedented” (Parrott & Moe, 2020). At the same time, in the richest country in the world, the hegemonic superpower, which spends 60 % of its annual federal budget in weaponry, found itself totally lacking in terms of adequate supplies of both the face masks and ventilators necessary for its own citizens. COVID-19 has indeed brought to the fore in a dramatic fashion how large areas and large numbers of people the world over suffer from imbalance, inequity and injustice as the economic and social connections played out on the stage of the resourcesphere render it essentially a gigantic inequosphere. Worse still, the pandemic has not only caused the extent of the inequality to emerge but risks aggravating it in all its manifestations. One example on a vast scale is that of the e-mergency of the plight of tens of millions (perhaps even one hundred million) of migrant workers in India, deprived in the space of four hours by a lockdown of everything (work, home, food, means of transport), first rendered invisible by ignoring them and then invested by measures supposedly designed to provide succour but which in most cases did nothing but worsen their suffering (Sainath 2020). Moreover, both the USA and India are examples of democracies, but recent events should make it clear that, counter to what we would often like to think, democracy offers no immunity either to disease or to inequality and injustice.

Rethinking systemically the noosphere and the infosphere

The imbalances and inequalities of the resourcesphere are mirrored within both the noosphere and the infosphere. This, in turn, risks increasing the imbalances and the inequities in the relationship between the scientific and technological connections to the biosphere and, consequently, to the planetary and eco-systemic connections to which it is home. And the more the imbalances, inequities and inequalities increase, the more they cause human contradictions to emerge and worsen. For example, within the noosphere the lack of systemic thinking and vision due to the long-standing dominance of individualist theories in fields such as economics and politics and reductionist perspectives in many sciences has tended to create various forms of tunnel vision and parcellation of the world into separable and quantifiable objects, thereby condemning all that remains beyond the individualist and reductionist scope to invisibility, even leading to assuming their non-existence.

While it is clear that analysis of all natural and social phenomena must start from individual inorganic or organic components, information first gathered at the level of unitary entities must gradually become part of a composition able to encompass increasing levels of interconnectedness. As expressed by the winner of the 1977 Nobel Prize for Physics Phil Anderson, in his description of the emergence of complexity in the transition from the subatomic world of quantum physics, to that of the sciences of chemistry, biology, psychology and anthropology, “more is different” (Anderson, 1972), something which clearly emerges in the transition from the individual sets of data gathered on a daily basis to the developing epidemiological vision of the current pandemic.

The need to recognise how everything is interconnected, how at every new level a new vision emerges, and the illusion that comes from failure to do so, is also well described by Gregory Bateson: “... while I can know nothing about any individual thing by itself, I can know something about the relations between things” (1987, p. 157). Bateson constantly warned against the risk of rupture of the connections between mind and body, nature and nurture, organism and environment, self and society, and the ruinous outcome of this. At the same time, in recent decades, the idea of being connected has been potentially enriched, but at times risks being impoverished, by the advent of digital technology, which has perhaps brought out some of the most evident examples of human contradictions. There are massive contradictions in the fact that most human beings would openly declare their opposition to child labour or unjust exploitation of workers and to the indiscriminate production of human waste, while at the same time showing an ever more voracious appetite for consuming technological gadgets.

ICT has also led to a further immense human paradox, whereby our craving for “being connected” digitally means we are often dis-connected analogically, progressively losing direct contact with the

biosphere, the eco-systems we are a part of, our spatially defined places and the people, associations and institutions that inhabit them. Once again, the current pandemic has provided numerous examples of contradictions ranging from the risks involved in humanity being inundated with data it does not have the capacity to process to the advantages that may accrue from digital technologies and their impact on public-health strategies, or from the pitfalls caused by an unthinking belief in online learning to the disadvantages of being excluded from educational processes dependent on a totally unequally distributed access to the internet.

From one point of view, Tim Berners-Lee is quite right to underline how, “for many, the web has been the critical unifying force, enabling work, school, social activity and mutual support. [...] But [these] are the lucky ones. Billions of people don’t have the option to turn to the web in times of need or normality. A gross digital divide holds back almost half the planet when it most needs the web. This divide is most acutely experienced in developing countries. The position is particularly dire across Africa, where only one in four people can access the web and the benefits that so many of us take for granted. Women, in particular, [...] are excluded ...” (Berners-Lee, 2020). At the same time, it would be utterly wrong to believe that all we need to do is eliminate the digital divide and enable the whole world to access the web. The mere extension of contradictions can only aggravate rather than resolve them.

Patrignani and Whitehouse argue for the need to develop “ICT that are good, clean, and fair, socially desirable, environmentally sustainable, and ethically acceptable” (Patrignani & Whitehouse, 2019). Yet the current extraction of many minerals necessary for the production of ICT devices clearly satisfies none of these criteria. Lithium is needed for the production of consumer electronics – including wireless earbuds, smartphones and laptops – but mining and refining it has devastated many ecosystems and communities in countries as far apart as Australia and Chile. The mining of cobalt, another component of such goods, is a direct cause of child labour in the Democratic Republic of the Congo. Each of the same criteria could clearly be applied to considering recent and rapidly expanding projects for launching satellite constellations, such as those being implemented by SpaceX and OneWeb. These indeed offer evident examples of the dangers involved in the attempt to expand our resourcesphere to include the space around the Earth in order to extend the infosphere way beyond its current limits. Such dangers include the impact on the astronomical sky (since the earth may shortly be blanketed by tens of thousands of satellites) related to an immense increase in light pollution, with a consequent reduction of our ability to build new knowledge of the cosmos or simply indulge the joyous contemplation of the night sky as a thing of beauty. Long before such projects were envisaged, back in 1994 a draft of the UNESCO *Universal Declaration of Human Rights for Future Generations* affirmed that “persons belonging to future generations have the right to an uncontaminated and undamaged Earth, including pure skies; they are entitled to its enjoyment as the ground of human history of culture and social bonds that make each generation and individual a member of one human family” (UNESCO, 1994), although subsequent published documents removed specific reference to the skies. Once again, the question concerns the relationship between the various forms of capital (in particular, but not only, natural and produced) exploited within the resourcesphere and perhaps above all the very notion of property - private and public, individual and common – in terms both of its definition and its application.

Visions of interconnectedness and interdependence

Each of the contributions to this issue of *Visions for Sustainability* offers a particular view of how human trajectories intersect with each of the spheres that comprise our world. Three original papers consider different aspects of human beings’ interconnectedness with the biosphere and how scientific and technological developments can mediate that relationship in a positive way from the perspective of biophilia. In “Biophilic Design: How to enhance physical and psychological health and wellbeing in our built environments”, Bolten and Barbiero examine recent findings on the relationship between man and nature to render artificial spaces more coherent with innate human biophilia. They argue that the application of Biophilic Design reduces stress, stimulates creativity and clear thinking, improves physical and psychological well-being and accelerates healing. They suggest that, taking account of the rapid growth of global urbanization, such benefits will become increasingly important in the design of our urban spaces, architecture and interiors.

In “Does sustainability address perceived restoration? An exploratory study on Biosphera

2.0, a net zero energy house.”, Berto, Maculan and Barbiero illustrate how individuals are not passively affected by the physical characteristics of the environment and how they react to it and try to modify it. They argue that human beings’ efforts in this respect tend towards environments more restorative and sustainable from a cognitive point of view, i.e., environments where daily life is less stressful and more satisfying. Their study aims to verify to what extent energy zero housing corresponds to these requirements in terms of a *Perceived Restorativeness Scale* by gathering participants’ perceptions of such attributes as semiotic and sensorial attributes and the absence of environmental stressors.

In “Investigative Study of Relationship between Built Environment and Perceived Restorativeness: Cases of Colonial Churches of Dalhousie”, Rai, Asim and Shree discuss how the built environment of a region can influence or dominate its ecosystems, services and can regulate the processes associated with human health and well-being. They argue that urban areas are considered central business hubs and are hence created with elements of attraction and benefits which can influence human satisfaction in a particular way, while rural areas are rich in nature and are claimed to be associated with psychological restoration due to their natural diversity. Their study focuses on aspects of a *Perceived Restorativeness Scale* through exploring some of the human preferences in nature-rich religious built environments.

Two original papers then address different aspects of how human beings are a high-level energivorous species and have only recently realized that it is no longer possible to continue indiscriminately putting additional demands on earth’s resources. In “The Power to Change: A Brief Survey of the Wind Power’s Technological and Societal Potential, Barriers to Use, and Ways Forward”, Kopnina explores the history, technology, and barriers to acceptance of wind energy. She asks the question why, despite the problems associated with the fossil fuels, more ecologically

benign energy is still scarcely used. She shows how grassroots resistance is often fueled by the mistrust of the government and how the governments’ reason for resisting renewable energy can be explained by their history of a close relationship with the industrial partners. She then argues that understanding of various motivations for resistance at different stakeholder levels and understanding the role of democracy in decision-making opens up space for better strategies for a successful energy transition.

In “Waste-to-wealth: The economic reasons for replacing waste-to-energy with the circular economy of municipal solid waste”, Pagliaro argues sharing the same raw material, recycling and composting are in direct conflict with incineration of municipal solid waste in combined health and power plants. He then discusses the economic viability of municipal solid waste incineration to produce electricity and heat in the context of increasing the role of electricity production from renewable energy sources as well as of the emerging circular bioeconomy.

In his letter “For a health-promoting, inclusive and complex vision” Ferrara considers various aspects of collective and individual health and reflects on how COVID-19 is forcing us to rethink ideas concerning the relationship between so-called “diseases of progress” and transmissible illnesses. He argues that placing faith in technology to protect us is illusory. In the first place, because this would stem on an unsustainable dependence on the very technology that lies at the heart of the reciprocal strengthening of transmissible and non-transmissible diseases favoured by environmental deterioration. Secondly, because it reduces our relationships and connections to a surrogate form that can work only within nihilist and self-consolatory perspectives.

In “A Vision for Futures Education Promoting Knowing as Intelligent Action”, their review of *Intergenerational Education for Adolescents towards Liveable Futures* by Kathryn Paige, David Lloyd and Richard Smith, Cambridge Scholars Publishing, 2019, Colucci-Gray and Dodman start from the premise that education is an essential investment that every society must make in terms of its own future and that the characteristics and the quality of both the education and

the future are mutually interdependent. They argue that for the first time ever we have come to be aware that the future we are building must be liveable, something that has thus far been taken for granted, but which we now know we ourselves have radically jeopardized. Since it has recently become increasingly clear that the need to change human trajectories is perceived with the greatest urgency by the young people who most risk facing the increasingly devastating consequences of an unsustainable present, we thus need an education that is coherent with this awareness. They illustrate how in the authors of *Intergenerational Education for Adolescents towards Liveable Futures* propose a framework designed to meet that need.

Learning how to connect

The current global health crisis has given us the opportunity to experience first-hand how we can make a tangible impact on the lives of people around us (by working together to contain deadly infections), as well as on the lives of other living creatures (by containing our own ubiquitous presence). But there are also other, and more subtle dimensions to this process of awareness-raising. If we return to Lovelock's concept of Gaia (Lovelock, 1995), we can look at the planet we inhabit as a complex living system, with interdependent relationships, generating positive and negative feedbacks on a global scale. From this point of view, we can elaborate this encounter with the 'virus' as an instance of reflection on the quality of such relationships, upon which basis they are being established and maintained. For example, we could consider the quality of our lived environments, our homes and our cities. The rampant spread of metal and glass – the extraction of which leads to a massive ecological footprint – gives our cities the least life-enhancing framework possible. Metal and glass do not easily accommodate the labour of microorganisms – such as lichens and mosses – which play a crucial role in the regulating and circulating the materials enriching the biosphere. Yet, such microorganisms continue to teach us about ways of living together, proving numerous examples of mutualism, reciprocity and cooperation.

As the Indigenous researcher Robin Wall Kemmerer demonstrates, the symbiosis between the alga and the fungus is suggestive of a creative and stable arrangement for the reciprocal exchange of sugar and minerals: "The resulting organisms behaves as it were a single entity, with a single name" (Wall Kemmerer, 2013, p. 271). Such symbiosis contributes to the fertility of soils, the health of the air, the distribution of minerals across food webs, in a dance of reciprocal give and take which supports life on Earth. Hence, we are constantly reminded that there are greater partnerships we seek to establish with the non-human world to enable ours and the sustainability of the earth of which we are a part.

It is indeed to be hoped that we will be able to rethink systemically our interactions with the biosphere we inhabit, the resourcesphere we depend on, the noosphere and the infosphere we have created and continue to develop. As Bruno Latour has pointed out, "the first lesson the coronavirus has taught us is also the most astounding: we have actually proven that it is possible, in a few weeks, to put an economic system on hold everywhere in the world and at the same time, a system that we were told it was impossible to slow down or redirect" (Latour, 2020). It is certainly too soon to understand if we have really learnt the lesson and will be able to translate it into vision and action. The task is immense. As Latour continues: "injustice is not just about the redistribution of the fruits of progress, but about the very manner in which the planet is made fruitful". We could also add that it is also a question of how it has been rendered unfruitful.

Once again, India offers us an example of enormous proportions, whereby over the last thirty years the vast agricultural system has been destroyed, with the dual consequence of rendering the country much more vulnerable and unsustainable while creating a massive quantity of cheap labour ready to be exploited. Returning to Latour, "[the lesson] means learning to select each segment of this so-called irreversible system, putting a question mark over each of its supposed indispensable connections, and then testing in more and more detail what is desirable and what has ceased to be so" (Latour, 2020).

The first few months of 2020 have given us a unique opportunity to realize what a virus has forced us to see that we have become. An emergency has made abundantly clear what we should never lose sight of. The sustainability of the human enterprise and its trajectories depends entirely on our ability for collaboration (helping each other when the need arises) and cooperation (working together to realize common objectives and outcomes that are our very reason for being). To connect or not to connect, and above all learning how to connect, is very much the question. The answer has to come through systemic thinking that will help empower us to build new technological awareness, new enterprises, new ways of producing and consuming. Our ability to develop collective intelligence and competent communities

depends on being connected and achieving true understanding of how this means our vital (because life-giving) connection is to and through nature and how any form of illusory or partial connection that risks disconnecting us from that will ultimately be destructive.

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