

# Radiation, Robot Bees and 5G: The Nightmare Unfolds

by *Jeremy Naydler*

## The Creation of a New Electronic Ecosystem

Earlier this year, the UK Government published its strategy for the introduction of the next generation of wireless interconnectivity, referred to as 5G or “fifth generation”.<sup>1</sup> The Government document explains that unlike previous generations of mobile networks, 5G is not just about enhancing existing technologies through faster connections and bigger data transfer capacity; it is about establishing “a system of systems”, involving hundreds of thousands of new generation mini-mobile phone masts or antennas (referred to as “small cell transmitters”), that will be deployed in urban centres up and down the land. It is anticipated that in an area the size of the City of London (famously a “square mile”), forty-two thousand new antennas will be required.<sup>2</sup> This is roughly as many antennas as currently exist throughout the whole of the UK, and gives an indication of the massive scale of investment that will be needed in order to implement 5G across the nation.

The introduction of 5G in the UK is part of a co-ordinated global effort that is now gathering pace, with trials already underway in many different countries, some further ahead than others. The aim is to create an electronic infrastructure, planetary in extent, and so comprehensive that what is planned is now widely referred to as the creation of a global “5G ecosystem”. We tend to think of ecosystems as composed of communities of living organisms interacting with soil, rocks, rivers and so on, but what is envisaged is the creation of a second, entirely electronic, network of interacting technologies that will encompass, embrace and interpenetrate the primary reality of the natural environment that human beings have for millennia lived within. This alternative electronic ecosystem will be like an invisible net thrown over the world, capturing an increasing number of objects – not only man-made appliances, but also living creatures and natural processes – and incorporating them into an ever-expanding global information network.

As the whole planet accelerates towards the dubious status of becoming “smart”, the Internet itself will increasingly shift its location to the external environment, becoming a so-called “Internet of Things”, to be accessed all around us, wherever we are. This of course is already happening, but 5G will enable it to happen far more effectively. One of the defining features of 5G is that it will give 100% coverage: there won’t be anywhere *not* covered by the new electronic ecosystem. Wherever one is, one will be “connected”. And this connection will be “seamless”. “Seamless connectivity” (a much used phrase in describing the benefits of 5G) means that any number of different computer programmes or systems will be accessible through a single user interface, be it a smartphone, tablet or laptop. It also means that wherever the user is, he or she will be immersed in the greater electronic ecosystem. There will, in other words, be a growing seamlessness between the physical world and the electronic world: the two will increasingly merge. We will live “seamlessly” between them.

The hugely popular game *Pokémon Go*, played on the smartphone, gives us a flavour of things to come. In this game, players set out to catch virtual “Pokémon” (animated cartoon characters) using their smartphone Global Positioning System (GPS) to pinpoint their location in the environment. There are different kinds of Pokémon to be caught – some are to be found in grass, some in buildings, some in rivers, some in the sea. Pokémon are everywhere, but they are invisible to the unaided eye. In order to catch one you have to view the world in real time, through the smartphone camera, using the Augmented Reality app [see footnote below], for only then are you able to see the virtual creature in front of you. In this way players learn to

---

[An app or “application” is a piece of software that is triggered by your GPS location to superimpose on your smartphone screen one of these Pokémon. -Ed.]



Fig.1

relate to the world as one aspect of a greater physical-virtual reality. It is the virtual aspect that claims their immediate attention: the physical environment in which the Pokémon 'hide' is just the backdrop to the game [fig.1 above].

*Pokémon Go* prepares its players for the greater game of life in the electronic ecosystem, in which our immediate sensory experience of the physical environment will increasingly seem in need of "augmenting" with virtual content in the form of information and imagery. As we learn to orient ourselves to the world through the mediation of digital information and data streams, the danger is that the acuteness of our unmediated sense-perceptions will diminish, our instinctive responses will atrophy. We will become more emotionally distanced from our actual encounters with living creatures and landscapes. Instead, we will relate to the environment through the lens of so much data to be analysed and utilised – data whose purpose is the enhancement of our ability to control our environment and achieve our desires. The danger is that the value things have in themselves will fade from view: lacking an electronic identity they will be experienced as lacking validity. We face a future in which the electronic world will increasingly assume the

role of gatekeeper to the world we physically inhabit, providing us with the information needed to orientate ourselves in the real world. And those people who do not participate in the virtual world via their remote device (be it a smartphone, a wearable or a biologically integrated device) will find themselves seriously disadvantaged. The reality we shall be obliged to live in will be a twofold reality: physical and virtual. Already we are becoming 'adjusted' to this.

### **The Onlooker Consciousness and Original Participation**

The development of the new electronic ecosystem is happening fast. The aim is to have it in place by mid-century. But just a hundred years ago the science of electronics barely existed (the term "electronics" only began to be used in the 1940s). The first experiments with electromagnetic waves only took place in the late 1880s, pioneered by Heinrich Hertz. Indeed, the experimental investigation of electricity itself only began to be systematically pursued in the 1660s, during the era of the establishment of the first scientific academies, like the Royal Society in London. The recentness of our relationship to electricity, which

for millennia was a force almost entirely unknown and unutilised, points to the fact that in some way it belongs together with our modern consciousness. For it was only with the birth of what Ernst Lehrs called the “onlooker consciousness” – the consciousness which stands behind the objectifying approach to the world characteristic of modern science – that electricity came to be discovered. What this means is that the discovery of electricity only became possible with the loss of the earlier participative relationship to nature, which still to a large extent characterised the ancient and medieval eras.<sup>3</sup>

When, during the seventeenth and eighteenth centuries, European settlers colonised America, they encountered Native Americans who still lived strongly within the older participative consciousness. This older consciousness was evocatively described by the Lakota Chief Luther Standing Bear, who bitterly lamented the collapse of the “old life” brought about by the white invaders. He wrote:

“The old life was attuned to nature’s rhythm – bound in mystical ties to the sun, moon, and stars; to the waving grasses, flowing streams and whispering winds.”<sup>4</sup>

The Lakota “knew that man’s heart, away from nature, becomes hard; he knew that lack of respect for growing, living things soon led to lack of respect for humans too.”<sup>5</sup> The Lakota never sat propped up in chairs, like the white people, but “came literally to love the soil and they sat or reclined on the ground with a feeling of being close to a mothering power... The soil was soothing, strengthening, cleansing and healing.”<sup>6</sup> So deeply attuned were the Lakota to the earth and to nature’s rhythms that they experienced through them the “Great Mystery”, the abiding presence of the spirit world, or *Wakan Tanka*, pervading the physical environment in which they lived. The Lakota saw that the white man had lost all connection not only to nature but also to the inner presence of spirit within nature. The only thing the white man seemed to value was money and monetary profit, and on this altar everything of human or natural goodness was sacrificed.

The tendency of the onlooker consciousness towards ever-greater detachment from, and objectification of, the natural world has only been accentuated by the digital revolution. The smartphone culture feeds the detached, objectifying consciousness that wiped out the Native Americans and now assaults every last remnant

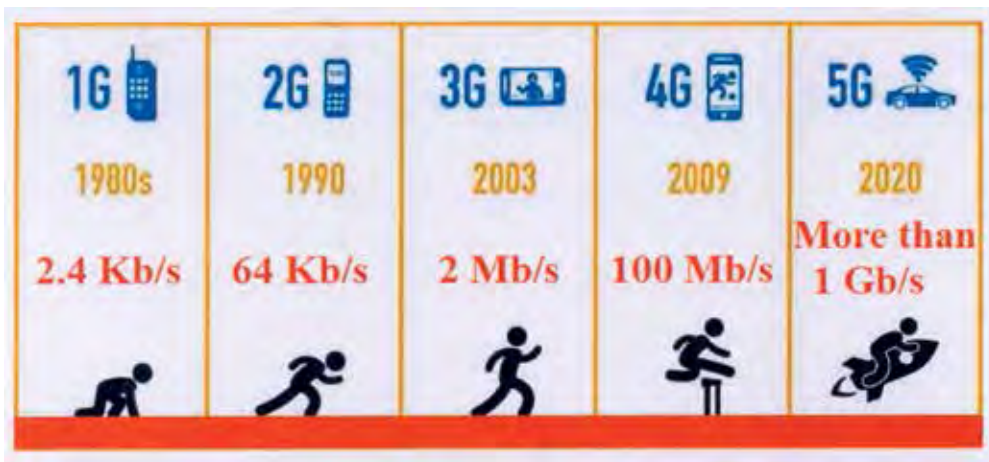


Fig.2

of the primordial, instinctive connection that human beings used to feel towards the Earth. The old compact with nature at the heart of the participative relationship has been replaced by a new, life-destroying alliance of the onlooker consciousness with the subnatural forces of electricity.

### Abandoning our Connection to the Earth

If you consult the website of Electrical Engineering World, you will find there an image which sums up the way both industry and government would like us to think about 5G. In five frames, it shows the progress from 1G to 5G. In the first frame we see a man crouching, as if about to start a race. Above him is the first generation, analogue mobile phone. In the second frame he sets off (a second generation digital mobile phone is pictured above him) and in the third (the introduction of the smartphone) he is running fast. In the fourth he leaps over a hurdle and in the fifth frame (with the image of the driverless car) we see him lift off from the earth on the back of a rocket. This is supposed to speak to us of the stunning progress that the evolution through the Gs has involved. But it also inadvertently expresses the changing relationship of the human being with the earth. In the first frame, the man is at least still connected to the earth with both hands and feet, whereas in the second and third he is connected only with his feet. In the fourth he is leaping above the earth and in the fifth he has lost all contact with the earth as he flies up to the dizzying heights to which 5G will take him [fig.2 above].

At the end of June this year, a conference was held in the Netherlands on the topic of “smart farming”, one of the great promises of 5G.<sup>7</sup> Smart farming involves what has come to be known as “precision agriculture”, which is based on the collection of vast quantities of data through sensors placed in fields, or on air-borne unmanned drones and land-based robots. In 2015, 30 million devices connected to the Internet were installed in the service of precision agriculture worldwide.



Fig. 3

This is set to increase to 75 million in 2020.<sup>8</sup> The sensors in the soil monitor such factors as soil acidity and temperature, and can access climate forecasts to predict weather patterns. The airborne drones survey the crops with near-infrared sensors, which we are told can identify stress in plants ten days before it becomes visible to the human eye, warning the farmer of water or fertilizer shortage, or incipient insect attack.<sup>9</sup> As for the land-based robots, it is predicted that in ten to twenty years they will have largely replaced human agricultural labourers in “developed” nations. Currently robots can already perform a wide variety of agricultural tasks and can be controlled by a console held in the hand. Soon they will be completely autonomous. As with the airborne drones, on-board sensors enable the monitoring of the condition of crops and give the robot the ability to apply various treatments, including beaming ultraviolet light to stop mildew from damaging the plants.<sup>10</sup>

Today you can walk in fields for miles on end in the UK and you are likely never to set eyes on a farmer or farm labourer actually standing on the soil. Within the farming community, with the exception of small organic and biodynamic farms, it seems that relationship to the land, to the soil as “mothering power”, has finally been lost. The 5G ecosystem will carry this tendency to an even greater extreme of alienation, because it is not an ecosystem for living organisms: it is an ecosystem for intelligent machines and robots. At the smart farming conference in the Netherlands, there was discussion on how to respond to the worrying decline of bees. No one mentioned that bees are highly electro-sensitive, a fact which has been known for more than forty years, with many recent studies confirming their hyper-sensitivity.<sup>11</sup>

The connection between colony collapse disorder and exposure to radio frequency and microwave radiation has been repeatedly argued by researchers, but at the smart farming conference a new, “smart” way forward was presented as the perfect solution to the problem: a new pollinator drone called “APIS”. The acronym stands for Autonomous Pollination and Imaging System. It is a fully autonomous “micro air vehicle” designed for greenhouses – one of several currently being developed in different research establishments across the world.<sup>12</sup> The technical advances that have been made in indoor navigation, miniaturization and precise vision-based control underpin the viability of the design. If our bees are being killed off by the new electronic ecosystem, never mind. The new ecosystem enables them to be replaced with robot bees [fig.3 above].

In this one example the deeper purpose of the 5G ecosystem is laid bare. It is to enable intelligent machines, or machine-organism hybrids, to usurp natural organisms. The technological revolution that we are currently living through goes beyond the extension of our control over nature: it is aiming at the *replacement* of nature with a fully technologised planet. If people today were not so enamoured with the flood of increasingly sophisticated gadgets and robotic devices that promise to entertain or empower us, it would be tempting to resort to conspiracy theory to explain what is happening: a shadowy elite, a hidden agenda. But no, it seems that both nature and essential human values are being undermined by popular consent, and by an unbridled enthusiasm for ever-greater technologisation of the conditions of life. It is as if something diabolical has got into our souls and cast a spell over us.

## The Electrosensitive World

Even in its present imperfectly realised state, the electronic ecosystem has severely detrimental effects on many living organisms. It is not only bees that are electro-hypersensitive, fleeing the presence of highly charged electric fields, becoming disoriented, angry and self-destructive.<sup>13</sup> Recent research on ants found that they too are remarkably sensitive to wireless radiation, becoming noticeably agitated when exposed to it, and abandoning their nests when in close proximity to mobile phones in standby mode.<sup>14</sup> Beetles, fruit flies and spiders are also highly electro-sensitive. As the years go by, and more studies are made, more and more living organisms are shown to be adversely affected by electromagnetic radiation at precisely those frequencies that constitute the electronic ecosystem. Trees and herbaceous plants, germinating seeds, tadpoles, frogs, newts, birds, pigs, mice, voles... The list goes on.<sup>15</sup>

By coincidence, in the same month of June that the smart farming conference was held in the Netherlands, a conference took place in Lewes, England, on the health effects of wireless electromagnetic radiation on human beings. It was attended by many people who are electro-sensitive, a classification which really applies to all of us, though only some of us are aware of it. The awareness is like a sixth sense, and is accompanied by debilitating physical symptoms that develop as a result of exposure to radio frequency and microwave radiation. For many years only mild effects may be felt – flu-like symptoms, headaches, skin rashes and insomnia. But there usually comes a tipping point when – due to one smartphone call too many or one hour too much in the atmosphere of Wi Fi – a threshold is crossed and the person becomes “electro-hyper-sensitive” (EHS). From that moment on, the likelihood is that the hyper-sensitivity will only become more acute. As a result, anywhere in the vicinity of a phone mast, a router, or a cordless phone, anywhere in city centres with their Wi Fi hotspots, or in houses, coaches, trains and hotel rooms with their all-pervasive Wi Fi – all become hostile, often excruciatingly painful, environments.

During this conference, one of the speakers, Dr Erica Mallery-Blythe, reflecting on the exponential increase in radio frequency exposure over recent decades and looking ahead to the introduction of 5G, predicted a medical tsunami heading towards humanity. As the general exposure to radiation intensifies, more people will become hyper-sensitised. Who doesn't already know someone who suffers from electro-hyper-sensitivity? I know at least seven people, and the worst affected are obliged to live like fugitives, seeking safe havens (so-called “white zones”) where levels of radiation are less toxic, and/or cocoon themselves in special shielding fabrics day and night. I have read of desperate victims of the nascent electronic ecosystem seeking refuge in

the depths of forests, or finding sanctuary in caves.<sup>16</sup> For such people, the electronic ecosystem is not an ecosystem at all: it renders the planet uninhabitable.

## Meeting the Challenge

The momentum behind the creation of the 5G ecosystem is so powerful that we cannot realistically expect to be able to stop it or even deflect it. Too many people desire the technological future it promises. We must therefore face the fact that the environment in which humanity and all other creatures shall be obliged to live will become increasingly saturated with electromagnetic radiation. Invisible, inaudible and imperceptible save to those who have become painfully sensitised to it, this deathly, counterfeit ecosystem will provide the infrastructure of a “smart”, that is to say electronically harnessed, planet. The goal, as stated some years ago by a company called HP Labs, dedicated to making the planet smart (in both senses of the word) is “to revolutionize human interaction with the earth as profoundly as the Internet has revolutionized personal and business interactions”.<sup>17</sup> This statement gives us a clue as to where we can take our stand.

How we interact with the Earth, how we interact with the natural environment in which we live, is something that still lies within our power; and a revolution in how we, and I mean each one of us, interact with nature is truly what is needed today. But the revolution needed is not one which simply extends our ability to manipulate and control the environment, enhancing our technological prowess without in any way developing our care for nature. What is really needed is the cultivation of a loving observation and a heartfelt caring for the vulnerable living creatures that surround us, and indeed for the soil beneath our feet, so that we rebuild our relationship with the natural world. Since Francis Bacon's inauguration of the scientific revolution, we have had four hundred years of developing a relationship to nature based on domination and exploitation. The onlooker consciousness now needs to be counteracted by an engaged, attentive and loving appreciation of nature. Goethe, who so well understood this, said “our full attention must be focused on the task of listening to Nature to overhear the secret of her process”.<sup>18</sup>

A great cry is going out from the Earth today. How can we open our ears to this cry, and wake up from the delusion that everything is going to be alright because so far we have managed to avoid complete catastrophe? The onlooker consciousness has now reached a critical extreme; it must be turned around, brought to ground, and transformed if we are to relate again in a respectful way to the primary reality of the Earth and the living creatures that dwell on the Earth.

Goethe spoke of the human being as the most powerful and exact scientific instrument possible, in so far as we

make use of our healthy senses.<sup>19</sup> He understood that only when we relate humanly to the world of natural phenomena, without the intermediary of technology, does it become possible to really participate in the secret of nature's process. Otherwise we remain outsiders – peering, probing, provoking. To the extent that we inhabit a world conditioned by our clever technologies and dominated by our clever technological thinking, the technological mindset itself prevents us from opening ourselves to the deeper mystery of existence.

This is not to advocate a return to the old participative consciousness of the Native American. We can't do that, for the simple reason that we have gone too far in the opposite direction. There can be no going back: we are all onlookers now. What Goethe was suggesting can only come about through deliberate resolve, the application of will and repeated effort on our part. At its heart is a moral step that we are obliged to take in order to overcome our alienation and self-centredness – to overcome the collective habits of centuries. It requires stirring ourselves again and again to an inwardly alert and selfless looking, listening, smelling, tasting and touching. It requires repeated contemplative engagement, grounded in empathy and the empathic imagination. It also requires great patience and persistence, both of which are necessary in order to enter into a deeper communion with the natural world.<sup>20</sup>

To take on this challenge, we have to disarm ourselves of our gadgets and devices in order to experience a more authentic knowing. Only then do we have the chance of perceiving things in their spiritual identity, inwardly illumined by the focused and reverent awareness which we can bring to them, and with which we can hold them in our consciousness. In such redemptive acts of perception lie both nature's, and our own, hope for the future. From them can spring initiatives and resolves that help to create a different direction of travel from the one in which mainstream culture is heading. But it needs us to set aside our smartphones, our tablets, our multiple devices – to leave them indoors, if only for a short time each day – the better to attend to the “sun, moon and stars, the waving grasses, the flowing streams, the whispering winds”. Thereby we can begin to actively counteract the delusion that the future of humanity rests on building a technological paradise, and engage in the real task of restoring both nature and ourselves to the “Great Mystery” that is our true ecosystem.

*Jeremy Naydler is a philosopher and gardener who lives near Oxford, England.*

## Endnotes

1. Department for Culture, Media and Sport and H.M. Treasury, *Next Generation Mobile Technologies: A 5G Strategy for the UK*, March, 2017.
2. *Ibid.*, p.21
3. Ernst Lehrs, *Man or Matter* (London: Rudolf Steiner Press, 1985), Chapter 2. See also Jeremy Naydler, *Electricity: A Call to Consciousness* (Oxford: Abzu Press, 2017).
4. Luther Standing Bear, *Land of the Spotted Eagle* (Lincoln and London: University of Nebraska Press, 2006), p.267.
5. *Ibid.*, p.197.
6. *Ibid.*, p.192.
7. Smart Farming Conference, Brightlands Campus Greenport Venlo, Netherlands, June 29<sup>th</sup> 2017.
8. Andrew Meola, “Why IoT, big data and smart farming are the future of agriculture”, *Business Insider*, Dec 20<sup>th</sup>, 2016.
9. Caspar van Vark, “Drones give big lift to global farming”, *Guardian Weekly*, 08/01/2016, p.34.
10. Tim Collins, “Meet Thorvald: Helpful robot farmer could replace humans in the fields within a decade”, *Mail Online*, 26<sup>th</sup> April, 2017.
11. Ulrich Warnke wrote a series of research papers on the electro-sensitivity of bees during the 1970s, the best known being “Effects of Electric Charges on Honeybees”, *Bee World*, 57.2 (1976), pp.50-55. For more recent studies see, for example, Sharma, V. P. and Kumar, N. K., “Changes in honeybee behaviour and biology under the influence of cellphone radiations”, *Current Science*, 98.10 (2010), pp.1376-1378. See also the careful study by Daniel Favre, “Mobile phone-induced honeybee worker piping”, *Apidologie*, 42.3 (2011), pp.270-279, in which active mobile phones placed near to honeybees induced the worker “piping” signal, indicating serious disturbance of the colony and instigating the swarming process.
12. “APIS, the pollinator drone” presented by Anthony Van der Pluijm and Aleksandar Petrov, Delft University of Technology, Micro Air Vehicle Lab, at the Smart Farming Conference, June 29<sup>th</sup>, 2017, Venlo, The Netherlands. Harvard University is another leader in this research. See Dina Spector, “Tiny Flying Robots Are Being Built To Pollinate Crops Instead of Real Bees”, *Business Insider*, 7<sup>th</sup> July, 2014.
13. Ulrich Warnke, “Effects of Electric Charges on Honeybees”, *Bee World*, 57.2 (1976), p.53, was one of the first to show that “bees in a strong electric field became aggressive, stinging each

other to death; communication was disturbed. At still higher fields, the bees tore out the brood from the cells, and no new brood was produced. The bees left the hive if they could, or otherwise they sealed themselves inside... and the bees died."

14. Marie-Claire Cammaerts and Olle Johansson, "Ants can be used as bio-indicators to reveal biological effects of electromagnetic waves from some wireless apparatus", *Electromagnetic Biology and Medicine*, 33.4 (2014). A summary of the findings is given in Katie Singer, *An Electronic Silent Spring* (Great Barrington: Portal Books, 2014), p.17f.
15. Alfonsi Balmori, "Electromagnetic Pollution from Phone Masts: Effects on Wildlife", *Pathophysiology* 16.2 (2009), pp. 191-199 provides a helpful overview. See also Ulrich Warnke, *Bees, Birds and Mankind: Destroying Nature by 'Electrosmog'* (Johannesburg: E. Oppenheimer and Son, 2009), and Arthur Firstenberg, *The Invisible Rainbow: A History of Electricity and Life* (Santa Fe: AGB Press, 2017), Chapter 16.
16. Doan Bui, "French Cave is Refuge For Electro-Hypersensitive Victims of Mega-Connected World", *Worldcrunch*, 4th January, 2012.
17. HP Labs website statement at [www.hpl.hp.com](http://www.hpl.hp.com), accessed 29/08/2012.
18. *Probleme*, 1823, quoted in Jeremy Naydler, *Goethe on Science: An Anthology of Goethe's Scientific Writings* (Edinburgh: Floris Books, 1996), p.72.
19. *Maxims and Reflections*, quoted in Naydler, *Goethe on Science*, p.29.
20. Such an approach has been pursued to good effect by Craig Holdrege and his colleagues at the Nature Institute in Ghent, New York. The method, which anyone can practise, is clearly set out in Craig Holdrege, *Thinking Like a Plant: A Living Science for Life* (Great Barrington, MA: Lindisfarne Books, 2013).



Thanks to Michael Leunig in Australia for permission to publish his cartoon