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Topical issues: nature

Our natural world is under assault from human activity. The trouble is, to recognise damage to nature reveals also the risk to ourselves. 'Progress' is in the hands not of individual people, nor their elected representatives and politicians. It is in the hands of the free market, the large corporates who set the direction of our world through creating profit streams however they can. We don't have to identify this as evil; rather it is almost inevitable. We are persuaded of the benefits of convenience and consumerism, and we are the source of the profits and the stimulant to corporate behaviour and the setters of social trends. What we must do is to observe, to ask questions, and be honest enough with ourselves to recognise that nothing we do is without consequence. If we are custodians of our children's futures, we must accept individual and joint responsibility for the condition of our planet.

Here are examples of honest concern over EM fields from telecoms affecting wildlife:

The Kompetenz initiative writes urgently to bee associations and beekeepers and explains about EM fields and bee colony collapse

U.S. Fish & Wildlife Service. Concerns Over U.S. Fish & Wildlife Service Concerns Over Potential Radiation Impacts of Cellular Potential Radiation Impacts of Cellular Communication Towers on Migratory Birds and Communication Towers on Migratory Birds and Other Wildlife Other Wildlife – Research Opportunities Research Opportunities

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Decline of bees, UK and worldwide

The Kompetenz initiative writes urgently to bee associations and beekeepers and explains about EM fields and bee colony collapse

Birds, Bees and Mankind: Destroying nature by 'electrosmog', Ulrich Warnke. A very significant researched publication, translated from the German, 2008.

HAARP Transmissions May Accidentally be Jamming Bees Homing Ability, Guy Cramer, 2007

(more on HAARP, what it is and why it presents a hazard)

'Honeybees will die out in Britain within a decade as virulent diseases and parasites spread through the nation's hives, experts have warned. Whole colonies of bees are already being wiped out, with current methods of pest control unable to stop the problem.

'The British Beekeepers Association (BBKA) said that if the crisis continued, honeybees would disappear completely from Britain by 2018, causing "calamitous" economic and environmental problems. ... Last year, more than 11 per cent of all beehives inspected were wiped out, although losses were higher in some areas. **In London, about 4,000 hives – two-thirds of the bee colonies in the capital – were estimated to have died over last winter**. Of the eight colonies inspected so far this year, all have been wiped out. ...'

Summary

Massive and sudden declines have occurred in bee populations across the world in 2006-2007. Honeybees sustain agriculture through pollination so human food supply depends on their well-being.

Sudden and wholesale loss of bee colonies is described as Colony Collapse Disorder, but does not explain the reason. Primary reasons suggested, and sometimes in the past confirmed, include parasitic mites and consequent viruses. More recently pesticides, GM crop use and climate change have been suggested. However, as this page seeks to demonstrate, the electromagnetic environment is also crucially influential on honeybees, and is undergoing rapid and enormous change from human communications systems.

- **Infestations** such as the varroa mite can be tested for quickly and easily, and could confirm this as the current cause, but this has not been reported this time.
- **Pesticide** use has not been suddenly altered across the world (Switzerland, Poland, Italy, Germany, Greece, the UK and 24 states of the USA).
- **Agricultural methods** are more intensive: hives may be fumigated, electric fan-ventilated, permanently illuminated, bees fed on the wrong sugar solutions over winter, and grown to be over-sized.
- **GM crops** have been introduced, and not always as openly as some would like. These indeed can affect insect balance, but again this has not been evenly building across all the affected areas and would be more localised.
- **Climate change** is undoubtedly altering plant diversity and honeybees can be very specific, but this would suggest more gradual population density movements rather than disappearance.

The sudden declines are marked by bee disappearance rather than just hives full of dead and diseased bees. The empty hives are not plundered by neighbouring colonies and other insects are not filling the pollination gap. This leaves two further possibilities:

- the hives are acting as a deterrent to bee return
- the bees are losing the ability to navigate or communicate.

Nothing in the bees, hives or honey is pointing to chemical toxicity or bio-predation. Since the studies lower down this page show that honeybees depend on natural electric and magnetic fields, and that they are frequency-specific in their communications, it is urgent that this line of enquiry is opened up.

Whilst the last bee species extinction in the UK occurred in 1988, there has been a steady decline in the bee population.

a timeline of bees in trouble and investigations

It's a particularly bad time to cut funding on bee inspectors, but this is exactly what has happened in the UK: Funding cuts threaten bee health (2004).

Bees are not just nice to have around and make honey; they are crucial to crop pollination and a vital element in agriculture and food production. The global economic value of pollination may be as much as £50bn. In June 2006 it was reported that bee decline may hit food crops in Northern Ireland, and the UK in general. The cause appears to be mites and late flowering losing synchronicity with the bees' nesting cycle. Farmers have been making efforts to restore habitat (eg field margins), and some decline appears to be restored.

Why this is not just interesting, but a critical issue: 'Approximately 80% of all insect pollination is accomplished by honey bees. According to the University of California at Davis publication "Don't Underestimate the Value of Honey Bees," the remaining 20% of other insect pollinators are drastically reduced in number as well, making one wonder if the problem is the varroa mite or something else affecting the broader insect world.' [Source: Suite 101]

Then in February of 2007 the bad news arrived of massive colony collapses across the US:

Mystery killer silencing honeybees. If the die-off continues, it would be disastrous for U.S. crop

yields.

Honeybees Vanish, Leaving Keepers in Peril

Species under threat: Honey, who shrunk the bee population?

Bee mystery buzzes area

Bee Alert survey with hive signs and symptoms

initial survey results: analysis of viruses

In **Austria**, an enquiry was made via the beekeepers' newspaper. 25 replied that they encountered problems after mast installations in the proximity:

- 37.5% reported an elevated bees aggressiveness
- 25.0% reported a tendency of bees to leave the hive
- 62.5% reported the collapse of the bee population.

No-one knows why

Pesticides and habitat?

Central to the argument of pesticide use has been Imidacloprid [more], a systemic nicotinoid agent that accumulated across harvest seasons and becomes available to pollinators. It attacks the nervous system, affecting learning and memory. See: Honey Bee Disappearances: Could Pesticides Play A Role?. Apparently after nicotinoids were withdrawn in France in 1994, bee colonies have still not yet fully recovered.

Whilst pesticides and loss of habitat appear mostly to blame, it isn't just farmers who can make a difference. Growing traditional plants in gardens would help, but we must remember that climate change is already visible, with the migration of many species (butterflies, insects, birds, fish etc.) all on the move, in a northerly direction. It may be worth considering therefore, the predictions about domestic gardens and the change to mediterranean plant varieties.

Another possibility is that agricultural methods, including bee-keeping is increasingly monocultural, reducing variety in both bee populations and the nectar they collect. See: A surprising decline of pollination services in USA. One factor in agricultural methods is **bee size**, and this does appear to make a difference in their resilient to mites. By pushing cell sizes up, commercial beekeepers develop bees up to 50% larger, that ostensibly are more productive. However, pushing this boundary has led to greater varroa problems that organic, natural-sized bees just do not suffer. [Opinions from an organic beekeeper.]

Some have pointed to GM crops, but this does not explain either the 20 year trend, the international aspect, or the suddenness of the 2006 USA event:

Are GM Crops Killing Bees? (Germany)

Collapsing colonies: are GM crops killing bees? *Der Speigel*, March 2007 (Germany)

Report from David Graves, an established New York beekeeper

Furthermore the bees have not just been dying in the hives, or being found dead, they have just been disappearing in their millions.

April 07, Palm Beach News reported: 'Troy Fore [executive secretary of the American Beekeeping Federation] and other bee industry figures and scientists said the phenomenon resembles many of the ways bees have always died, but for one notable exception: the empty hive is shunned by other bees and also by insect scavengers.

'"I was very much a skeptic about this thing when I first heard of it," said Danny Weaver, a Novosota, Texas, bee breeder who is president of Fore's group.

'He said his skepticism vanished when he obtained honeycomb from a collapsed hive and put it in an area heavily populated with bees and bee parasites, including wax moths.

'"Nothing would go near it," Weaver said. "Ordinarily, other bees would be robbing that honey, moths would be all over it. But nothing."'

Urgent investigation required

This observation must be tested further. A comb from a deserted hive and a comb from a thriving hive must be placed together where other species are plentiful.

- If the 'affected' comb is rejected but the 'control' is robbed, then this indicates the issue is embedded in the comb, not with the bees.
- If the comb and honey are then separated, each could similarly be tested for its influence on bees.
- If neither comb attracts other than opportunistic attention, then either the environment is disturbing normal activity or the bees and moths are being affected by something in the environment around the combs.
- The combs could then be tested separately to determine if one is itself influencing the environment of the other.

Since this is easily repeatable in many sites, it would quickly focus attention where it is due: comb, honey, pollinators or surrounding environment. (See below on bees, EM fields and their sense of smell.)

A man-made electromagnetic environment?

One trend that also causes concern is the electromagnetic environment. Ironically, power line pylons provide agricultral margins that are a haven for bees. In the US, it has been proposed that utilities do not mow the power line strips in order to halt the US decline in bees. Studies by Ulrich Warnke on bee behaviour in low frequency fields have, however shown supressed metabolic rates in bees, and a paper by J O Husing, 'Biene und Elektrizitat' in *Imkerfreund* (Beekeeper Friend) in 1965 noted effects of low frequencies on bee behaviour patterns. See also *Bee World*, 1976: Effects of Electric Charges on Honeybees.

There has been a deal of research on other insects, some relating to dimensional aspects on insect antennae. T Jaski noted in 1960 ('Radio waves and life', *Radio Electronics*, 31. pp. 43), that orientational reactions were observed in large ants when exposed to a SHF field of 10,000 MHz. They oriented their antennas along this electric lines of force and lost their ability to communicate the location of food to others. It was noted that the antenna length of the ants used in these experiments was almost a quarter of the wavelength to which they were they were exposed.

High electric fields present a greater problem in conductive hives (Bidokas et al., 1988). But it may not be hives and electrical fields that add to bee problems, so much as magnetic fields. Bees have a magnetoreception system sensitive down to 26nT at 10 to 60Hz, according to Kirschvink et al. (1997), decreasing rapidly with increasing frequency. Maybe living under power lines isn't a completely good idea. Balmori 2006, 'Effects of the Electromagnetic Radiation emitted by Mobile Telephony on Insects; Ecosystems' recounts the effect of mobile phone antennas on insects more generally.

Are EM fields to blame? This is one environmental burden that matches the decline of bees, and the rapid recent rise in universal infrastructures may explain more.

> Orientation and Navigation of Bees may be disturbed by man-made electric, magnetic and electromagnetic fields: a six-point statement by Dr. rer. nat. Ulrich Warnke, University of Saarland

Bees that vanished when a house went wireless

There was only one snag with Ryan Ferguson's new home, a three-storey Georgian house in Bath. When the 29-year-old digital sales director moved in three years ago, he found 30 nests of bees in his attic. 'They got everywhere', he says. 'In the shower, the windows, the light fittings. It used to be quite dangerous. You would walk about at night without shoes on and they'd be all over the floor.'

He twice called in exterminators, but the bees just came back. Then, last summer, he installed a WiFi system. They left and never returned.

reported Independent on Sunday, 22/04/07

Explore the bee crisis more

As the months have gone by, the expected confirmations of mites or other parasites have not been forthcoming. Autopsies on bees show totally destroyed immune systems. Correlation with GM crops does not appear to be true, and whilst originally organic bees appeared immune, now it seems they are not. Beekepers say that the stresses of breeding, transport, winter syrup nutrients are nothing new. Historical 'dwindles' or disappearances have always been due to known pathogens.

One beekeper in the US has imported Australian bees and placed them in untreated, sterilised and irradiated abandoned hives. In the latter the bees thrived, suggesting a biological factor. However, with still so much uncertainty and no identified single pathogen, a combination of factors may well be the best explanation: the 'perfect storm' where all the wrong things come together at the same time with a catastrophic result.

Honeybees may be wiped out in 10 years, Sunday Telegraph, 20 January 2008

Are British Columbia's bee colonies the latest to die off?

Condemned cells, Daily Telegraph Magazine, August 2007.

Environmental Emergency Updates: Part 1 – Spreading Honey Bee Disappearances – *Nosema ceranae* Not the Answer? (US, with global reports)

Australian bees in high demand (transcript and (as at May 2007) audio. Story: Australian bees shipped over to North America do not survive there: their immune systems are destroyed. Just the journey?

Millions of Bees Die – are Electromagnetic Signals to Blame?: 'tired bees' are also being reported in the UK

Flowers and fruit crops facing disaster as disease kills off bees (UK)

Hives left 'like Marie Celeste' as bees mysteriously vanish (Scotland)

More on bee decline in the UK and Europe

bumble bees in crisis (UK)

Why are Niagara's bees dying? (Canada)

Bee deaths (German)

Honey Bee Crisis extends from US to Britain and Netherlands (UK and Netherlands)

Scientists ask: Where are all the bees? (USA)

Where are the birds and bees?, Milt Bowling, Canada

Devastating disease decimating hives (USA)

Honey bee die-off alarms beekeepers, crop growers and researchers (US)

Parallel Declines in Pollinators and Insect-Pollinated Plants in Britain and the Netherlands (*Science*

21 July 2006)

Wild bees and the flowers they pollinate are disappearing together, (Leeds University)

The Honey Bee Crisis of 2007. Escalating Honey Bee Decline Baffles Scientists (US)

Millions of bees dying, signalling woe for environment (Italy)

Honey bee die-off alarms beekeepers (North America)

Queens – Poor Mating and Laying – An update July 2006 (UK)

Plight of France's honey bee (2003)

Wikipedia: a starter on Colony Collapse Disorder

and the Varroa mite

a Google search on Russian Varroa-resistant bees, introduced into the US in the 1990s. So is the decline not due to Varroa?

Bees are frequency-sensitive, like all living organisms:

It is interesting to reflect that many people complain of 'the hum', relating electromagnetic sources with an apparently acoustic phenomenon. There may indeed be more than one 'hum', but since bees are so sensitive to particular frequencies, this is a worthwhile route for research, especially if hives resonate in response to the now all-pervasive EM fields. GSM mobile phone systems produce a structural pulse frequency of 217Hz, DECT (cordlesss phones) 100Hz, TETRA 70.6Hz.

Birds, Bees and Mankind: Destroying nature by 'electrosmog', Ulrich Warnke. A very significant researched publication, translated from the German, 2008.

Magnetoreception System in Honeybees, Chin-Yuan Hsu et al., *PLoS ONE* 2(4): e395, April 2007

Honeybees can be trained to respond to very small changes in geomagnetic field intensity, Walker and Bitterman, 1989

Magnetic compass cues and visual pattern learning in honeybees, Frier et al., *Journal of Experimental Biology* 199, 1353–1361, 1996

Measurement of the threshold sensitivity of honeybees to weak, extremely low-frequency magnetic fields, *The Journal of Experimental Biology* 200, 1363-1368 (1997) (PDF)

Transmission of vibration across honeycombs and its detection by bee leg receptors, *The Journal of Experimental Biology* 199, 2585–2594 (1996) (PDF). Key frequencies for the bee: 15Hz and 250Hz.

Bursts of magnetic fields induce jumps of misdirection in bees by a mechanism of magnetic resonance, Korall H, Leucht T, Martin H. *Journal of comparative physiology*. A sensory neural and behavioral physiology, 1988, vol. 162, no.3, pp. 279-284

How Electromagnetic Exposure can Influence Learning Processes. See 'Honey bees as possible bioindicator for non-thermal effects' (p.7)

The Bees Who Flew Too High, nuclear magnetic resonance, bees, quantum effects and the relationship with sunspots. Bees are tuned to the whole of nature, not just flowers.

Quantum Honeybees. Read the story of Barbara Shipman and the quantum field honeybee dance.

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'Behavioural Changes under Exposure to Electromagnetic Fields'

Harst W, Kuhn J, Stever H (2006), Can Electromagnetic Exposure Cause a Change in Behaviour? Studying Possible Non-Thermal Influences on Honey Bees – An Approach within the Framework of Educational Informatics (English)

Kimmel S, Kuhn J, Harst W, Stever H (2007), Electromagnetic Radiation: Influences on Honeybees

(Apis mellifera)

Research summary:

- 2 beehives were unexposed and 2 beehives were exposed to a DECT phone.
- 25 bees were selected from each beehive and released 800 meters away.
- Unexposed beehives: 16 and 17 bees returned after respectively 28 and 32 minutes.
- DECT-exposed ones: 6 bees returned after 38 minutes to one hive. The other hive remained deserted.
- In the exposed beehives, there were 21 per cent fewer cells constructed in the hive frames after 9 days.

Bees rely on key enzyme for their sense of 'smell' in their antennal lobes:

It is interesting that the interpretation given in the February 2007 US news (above), is that the bees left in the hive being so diseased is due to immuno-suppression. If you take a look at our health pages under EM Fields you will see the evidence that electromagnetic fields (EMF) affect the behaviour of key enzymes that produce and regulate nitric oxide in living organisms, and why this is so important. If this is true of insects, then this avenue of research is also vital.

Impairment of olfactory discrimination by blockade of GABA and nitric oxide activity in the honey bee antennal lobes, Hosler JS, Buxton KL, Smith BH, *Journal of Behavioural Neuroscience* 2000 Jun;114(3):514-25

The Nitric Oxide System in Insects; 'In the honeybee, the NO/cGMP system in the antennal lobes is implicated in the processing of adaptive mechanisms during chemosensory processing, and recent findings support a specific role of the NO system in memory formation.'

Fireflies seen in a new light. The secret of their flashes is a gas (nitric oxide turns down the use of oxygen in the mitochondria, allowing oxygen to power chemical lights). **Hypothesis:** if man-made EM fields affect nitric oxide in fireflies, their communication will be impaired and populations will decline.

Where have all the fireflies gone? (2006)

Where have all the fireflies gone? (2007)

Fireflies in decline as natural habitats are destroyed (2008) – is it just human light and pollution? Or human EM fields too?

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More related bee sources

Honey Bee Quiet

Mobile Phones and Vanishing Bees, from Institute of Science in Society

Entomology professor and department head, May Berenbaum on the latest bee collapse

Mid-Atlantic Apiculture Research and Extension Consortium (MAAREC)

MAAREC Colony Collapse Disorder Working Group

European Community Biodiversity Clearing House Mechanism

Frequency of Bee Wings

More useful links:

The Big Bee Death from diagnose-funk, Zürich

Bee Mites Suppress Bee Immunity, Open Door For Viruses And Bacteria

The Plight of the Bumble Bee Affecting Plants Too (problem in Antigua too)

Mystery illness devastates honeybee colonies (14 Feb 07)

Bee and Flower Diversity Decline in Tandem (2006)

The Minnesota Honey Bee Battle MN Supreme Court protects pollinators from pesticides

Useful PowerPoint on the issues; mites and pesticides

Pollinator Diversity Declining in Europe (since 1980s)

Homing instinct of bees surprises. Britain and Ireland have 25 native species of bumblebee. Five are currently listed in the UK Biodiversity Action Plan because of their precarious status. Many of the other bee species have undergone major range contractions. Habitat? Sudden housing

changes??

Bee Decline May Spell End of Some Fruits, Vegetables (2004) – cause: viruses and parasites?

Our Forgotten Pollinators: Protecting the Birds and Bees (1996) includes pesticides as a major factor, and Africanized bees

The Russian bee import that went wrong

Pollinators in decline

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