Пластик: духовный и социальный экологический кризис

Plastics: A Spiritual and Social Crisis of the Ecology

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Появившись в качестве новых экспериментальных полимеров в прошлом столетии, сегодня пластики используются повсеместно – от упаковки пищевых продуктов до компьютерных систем, денежных расчетов и транспортировки. Однако широкая публика не слишком осведомлена о глобальном экологическом кризисе, вызванном пластиками. Британка по рождению, музыкант и преподаватель, я сорок лет работаю со школьниками и студентами университетов Канады и имею довольно точное представление об их идеалистическом и вместе с тем серьезном отношении к глобальным проблемам. Доклады посвящен вопросам формирования знаний об экологическом кризисе, вызванном пластиками как духовной и социальной проблеме глобальной экологии.

The rise of plastic over the past century from an experimental new polymer produced by organic chemists to a near-ubiquitous presence in the manufacture and delivery of everything from packaged food to military and electronic systems, money and transportation is well known. Not so well known to the general public is the crisis of the global ecology that has resulted. As a British-born educator and musician, I have worked with children in schools and young adults in universities in Canada for forty years and I am keenly aware of their idealism and concern with the world's problems. My special interest lies in building their environmental awareness of the plastics glut as a spiritual and social problem of the global ecology.

The World Plastics Glut as an Ecological Crisis

The rise of plastic over the past century began with the discovery by organic chemists of inert, synthetic, malleable polymers of high molecular weight which could be molded and set permanently into any desired solid shape.[1] Wartime demand for oil as a fuel and for the synthetic materials derived from it, and the ensuing expansion of the petrochemical industry since the 1950s, have led, as is common knowledge, to a near-ubiquitous presence of plastics by the early 21st century in the manufacture and delivery of everything from packaged food to military and electronic systems, money and transportation.[2] The manufacture of plastics by the petrochemicals companies has now become one of the world's leading industries.[3]

Not so well recognised is the crisis of the global ecology that has resulted from the worldwide glut of *discarded, non-decomposing* plastics. As a British-born educator and musician, I have worked with

[1] Nitrocellulose dissolved in alcohol and hardened into a transparent and elastic material was the first plastic, patented in Birmingham, England, in 1856. Combined with other ingredients, it could be molded when heated into products like celluloid (photographic film), artificial ivory (piano keys) or ping pong balls. The first fully synthetic heat-set plastic, Bakelite, was made out of phenol and formaldehyde in New York in 1907 by the Belgian chemist, Baekeland, who coined the word "plastic". After World War I, improvements in petrochemical technology led to the production of many new types of plastics, among them polyvinyl chloride (late 1920s), polystyrene (1930s), polyethylene (1933) and polyethylene terephthalate (PET, 1941), polypropylene (1954), and expanded polystyrene or Styrofoam, soon used for building insulation, packaging and hot drinks cups (also 1954). PET, on the other hand, became a common replacement for glass bottles.

[2] The English-language *Wikipedia* article on "Plastic", reviewed on 27 May 2018, comments: "Due to their low cost, ease of manufacture, versatility, and imperviousness to water, plastics are used in a multitude of products of different scale, including paper clips and spacecraft. They have prevailed over traditional materials, such as wood, stone, horn and bone, leather, metal, glass, and ceramic, in some products previously left to natural materials. In developed economies, about a third of plastic is used in packaging and roughly the same in buildings in applications such as piping, plumbing or vinyl siding Other uses include automobiles (up to 20% plastic), furniture, and toys. In the developing world, the applications of plastic may differ – 42% of India's consumption is used in packaging. Plastics have many uses in the medical field as well, with the introduction of polymer implants and other medical devices derived at least partially from plastic."

[3] In 2014, the top fifty chemical and plastics companies, located in 18 different countries but more than half headquartered in the United States of America, had combined world sales of US$961.3 billion. Of these companies, twelve were in the USA, eight in Japan and six in Germany. Cf. Alexander H. Tullo, "Global Top 50 Chemical Companies", in *Chemical and Engineering News* (American Chemical Society, 27 July 2015).

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Local Action

I encountered the plastic litter problem at the local level during an early spring walk in 2010 along Sawmill Creek, a pleasant stream near my suburban Ottawa home. Plastic garbage dropped by passing cars and pedestrians had accumulated below a busy roadway bridge over the watercourse, so I got together with a neighbour to clean it up. I also contacted my local city councillor to arrange for follow-up by city staff in keeping the creek clear of litter and fallen tree branches. It turned out that, due to conflicting jurisdictions, a provincial waterways conservation agency was also involved. The ecology of the stream's watershed has been extensively studied[4] and plastic and other debris were being removed annually along much of the creek's 16 km length by volunteers from the Rideau Valley Conservation Authority.

> The City Stream Watch program began monitoring Sawmill Creek in 2003 and has been performing community based stream garbage cleanups at many locations along the creek on an annual basis since that time. Unfortunately, given the urban nature of this creek it is often hard to keep up with the amount of litter that accumulates. We do our best and try to target as many "hotspots" as possible each year with volunteer based stream cleanups.[5]

But local cleanup is only a small part of the ecological problem of plastic debris. Transport by wind and water and deliberate dumping in rivers and oceans have led over the past forty years to the fouling of our entire planet by visible and invisible plastic waste. We are now facing a global crisis of plastics pollution.

Global Oceanic Pollution

Perhaps the most obvious indicator of this crisis is the five great plastic collection sinks accumulating in calmer seas within the rotating gyre of the major circulating ocean currents in the North Pacific, South Pacific, North Atlantic, South Atlantic and Indian Oceans. The largest of these is the Great Pacific Garbage Patch, centred offshore from the world's greatest producer of plastics, the United States, between California and Hawaii. This vast zone of floating, semi-dissolved plastic waste, a kind of microplastic soup full of larger plastic chunks, was discovered in 1997 and already was reported in 2009 as being more than twice the size of France.[6] It seems to have been considerably enlarged by the debris scoured off Japan by the tsunami of 2011. After recent ocean surface surveys scientists in 2018 recognized it to be 16 times bigger than originally thought, comprising about 80,000 tonnes of plastic, or about 1.8 trillion plastic objects and particles of all sizes, floating in an area of 1.6 million square kilometres.[7]

The North Pacific Ocean gyre has become a dead zone. In 2013 a British yachtsman described the desolation, horror and fear he encountered on a voyage from Osaka to San Francisco.

> After we left Japan, it felt as if the ocean itself was dead. We hardly saw any living things. […] I've done a lot of miles on the ocean […] I'm used to seeing turtles, dolphins, sharks and big flurries of feeding birds. But this time, for 3000 nautical miles there was nothing alive to be seen [italics mine].

In place of the missing sea life was garbage in astounding volumes. So much of it that the sailing vessel's auxiliary motor could not safely be run when it was becalmed.

> On the bow, in the waters above Hawaii, you could see right down into the depths. I could see that the debris isn't just on the surface, it's all the way down. And it's all sizes, from a soft-drink bottle to pieces the size of a big car or truck. [A passenger marvelled at] the "thousands on thousands" of yellow plastic buoys. The huge tangles of synthetic rope, fishing lines and nets. Pieces of polystyrene foam by the million.

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[4] Rideau Valley Conservation Authority, *Sawmill Creek Catchment: Lower Rideau River Subwatershed Report 2012,* downloadable as PDF file "Sawmill Creek Catchment Report.pdf" from https://watersheds.rvca.ca

[5] E-mail message to the author from Chelsey Ellis, City Stream Watch Coordinator, Rideau Valley Conservation Authority, 5 September 2013.

[6] Richard Grant, "Drowning in plastic: The Great Pacific Garbage Patch is twice the size of France", in *The Telegraph* (London), 24 April 2009, at https://www.telegraph.co.uk/news/earth/environment/5208645/Drowning-in-plastic-The-Great-Pacific-Garbage-Patch-is-twice-the-size-of-France.html.

[7] Josh Gabbatiss, "Great Pacific **G**arbage **P**atch 16 times bigger than previously thought, say scientists**:** New research shows quantity of microplastics is growing 'exponentially' in zone between California and Hawaii**",** *The Independent,* 23 March 2018.

> [The yachtsman added that he had asked American researchers to] push for a fleet to go and clean up the mess. But they said they'd calculated that the environmental damage from burning the fuel to do that job would be worse than just leaving the debris there.[8]

The world's governments and the United Nations have been slow to react, so several innovative private cleanup efforts have been proposed, including a British solar-powered sea-going vacuum cleaner.[9] Less power-consuming is the approach of Boyan Slat, a young Dutch entrepreneur who in 2013 founded and crowdfunded the Ocean Cleanup Foundation. His technology startup now employs 65 staff in building a prototype, low-tech seagoing system of booms and baffles to corral and collect vast quantities of floating plastic waste. It will put out to sea from San Francisco in the summer of 2018 for testing in the Great Pacific Garbage Patch.[10]

The link between plastic pollution in small streams like Sawmill Creek and the great oceanic accumulations of plastic garbage is of course the lakes and rivers through which thousands of pieces of plastic are borne daily to the sea. Indeed, major world rivers, in Asia especially, like the Ganges, despite their historical and cultural significance, are now choking in their lower reaches and estuaries with plastic pollution. Accordingly, there are also proposals for scooping up plastic waste from river estuaries before it can be washed out to sea to join the nearest garbage patch.[11]

Even the Arctic, formerly a pristine region of snow and sea ice, has not escaped from the scourge of plastic pollution, whether by human activity in the region, by northward flowing rivers feeding into it, by currents from the North Atlantic and the North Pacific, or by airborne microplastic particles.[12]

A Destroyer Both on Land and at Sea

In Europe and North America notable efforts and tax dollars have been invested over recent decades to develop collection programs that segregate some types of urban plastic waste and recycle it. But despite a major social investment in such programs, it is estimated that 79 per cent of all used plastic still ends up in landfills or open dumpsites, and only 9 per cent is recycled.[13] Worse, much of the world's plastic computer waste, shipped to scavenging dumpsites overseas, has been contaminated with toxic metal dust from electronic components which can leach into the water table and enter the food chain.[14]

Nor is uncontaminated plastic merely an inert eyesore. Rather, waterborne plastic waste is implicated in many other environmental and ecological threats. It is well known that industrial-scale overfishing for human consumption, often carried out illegally, is depleting the world's ocean stocks of food fish. But as part of this rapacious industry the abandoning of plastic fishing nets at sea is routine, and so much of this "ghost gear" is now in the oceans that whales, seals, birds and many other marine species entangled in it are dying by the thousands each year to no purpose.[15]

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[8] Ivan Macfadyen of Newcastle and his passenger Glenn Macfadyen, as quoted by Greg Ray, "The ocean is broken", *Newcastle Herald* (U.K.), 18 October 2013, at http://www.theherald.com.au/story/1848433/the-ocean-is-broken/--this/.

[9] Lorraine Chow, "Solar-Powered Vacuum Could Suck Up 24,000 Tons of Ocean Plastic Every Year", *EcoWatch,* 19 February 2016, at https://www.ecowatch.com/solar-powered-vacuum-could-suck-up-24-000-tons-of-ocean-plastic-every--1882175554.html. The system is called the SeaVax.

[10] Website at https://www.theoceancleanup.com/; Vibeke Venema, "The Dutch Boy Mopping Up a Sea of Plastic", *BBC News Magazine*, 17 October 2014, at http://www.bbc.com/news/magazine-29631332; Jane Dalton, "World's first ocean plastic-cleaning machine set to tackle Great Pacific Garbage Patch: Pioneering effort to collect debris that kills wildlife about to begin after teenager made his dream come true", *The Independent,* 22 April 2018, at https://www.independent.co.uk/news/world/americas/ocean-plastic-cleanup-machine-great-pacific-garbage-patch-launch-boyan-slat-a8317226.html.

[11] For example, there is interest from India in using the SeaVax (note 9 *supra*) to clean up the Ganges River estuary.

[12] Jamie Doward, "How did that get there? Plastic chunks on Arctic ice show how far pollution has spread: Discovery by UK scientists prompts fear that melting ice will allow more plastic to be released into the central Arctic Ocean – with huge effects on wildlife", *The Guardian,* 24 September 2017, posted on the Internet at https://www.theguardian.com/world/2017/sep/24/arctic-plastic-pollution-polystyrene-wildlife-threat; Roger Harrabin "Plastic Waste Building Up in Arctic", *BBC News,* 8 February 2018, at http://www.bbc.com/news/science-environment-42947155.

[13] "Seven charts that explain the plastic pollution problem", *BBC News: Science and Environment,* 10 December 2017, at http://www.bbc.com/news/science-environment-42264788

[14] Anna O.W. Leung et al., "Heavy Metals Concentrations of Surface Dust from e-Waste Recycling and Its Human Health Implications in Southeast China", *Environmental Science and Technology,* Vol. 42 No. 7 (4 March 2008), pp. 2674-2680. Synopsis: Uncontrolled recycling of printed circuit boards in China presents a significant environmental and human health risk.

[15] Jane Dalton, "Seafood giants let thousands of whales, dolphins and seals die in agony each year from discarded fishing equipment: Litter from boats becoming so bad that oceans could end up empty of edible fish, says charity", *The Independent,* 8

Not only do sea creatures strangle in plastic, they inhale and ingest it in considerable quantities, often with fatal consequences. Whales with bellies full of indigestible plastic which they mistook for food are routinely found dying on the world's coastlines.[16] Albatrosses in the Southern Ocean mistakenly feed plastic shreds instead of fish bits to their young, which die.[17] And microplastic particles, to which larger plastic debris in the garbage patches is inexorably eroded by the action of wind and wave, are consumed by fish and end up in the human gut[18].

Finally, there are cultural casualties. Historical landmarks, cultural treasures and sites of natural beauty justly attract visitors in large numbers, but plastic litter around urban monuments or floating plastic pollution covering a Caribbean bay and extending out to sea as far as the eye can see[19] will spell the death of local pride as well as destroying the local tourist industry.

Plastics pollution is a world-wide ecological crisis. And given that the major chemical and plastics firms have recently invested in increased production capacity in their drive to plasticize the packaging and consumption of every commodity, things are going to get worse, not better.[20]

Assigning Blame

It is all too easy to ignore the world's plastics pollution crisis or to assign blame for it, rather than taking measures to deal with it. Often the major sites of plastic pollution are far away from us, and both governments and citizens tend to have their eyes closed about the problem; if it is Not In My Back Yard it doesn't concern me and I don't have to do anything about it. This NIMBY effect is a barrier to responsible ecological citizenship and the cultural change necessary to reduce the world plastic glut. A major task of ecological educators is to point out how the young can and should get involved with the plastics pollution problem, not just locally but globally.

Instead we tend to assign blame for international plastics pollution to the big chemical and plastics companies, or to the new Asian throwaway economies, or to the throwaway business models of the multinational food industries, or to bureaucratic inertia. The young even blame their parents' generation for polluting the world with plastic, rather than recognizing their own complicity in it.[21]

Rather, we need to search ourselves for the root causes. We are living in an age of ignorant convenience, where many of us accept or expect prepackaged quick solutions to everything, whether in stores or over the Internet, without knowing or caring how the solutions are delivered. Why learn to cook or grow food when you can buy prepared meals locally or vegetables and fruits shipped from far away, all packaged in throwaway plastic? Why repair something when you can cheaply buy another one, usually made of plastic – not that it will last very long, of course. Planned obsolescence and mechanisation have largely

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March 2018, at https://www.independent.co.uk/news/world/seafood-firms-discarded-lost-fishing-equipment-thousands-whales-dolphins-seals-die-plastic-pollution-a8244181.html.

16 Lydia Smith, "*Blue Planet II*: Whales dying from pollution as they ingest toxic plastic. David Attenborough will deliver hard-hitting message in this week's episode", *The Independent,* 19 November 2017, found on the Internet at https://www.independent.co.uk/news/science/whales-dying-plastic-pollution-ingest-toxic-environment-blue-planet-ii-a8063576.html; Helena Horton, "Whale found dying off coast of Norway with 30 plastic bags in its stomach", *The Telegraph,* 3 February 2017, at https://www.telegraph.co.uk/news/2017/02/03/whale-found-dying-coast-norway-30-plastic-bags-stomach/; Josh Gabbatiss, "Plastic pollution killed sperm whale found dead on Spanish beach: Marine mammal had 29 kilos of plastic in its stomach, blocking its digestive system and leading to its death", *The Independent,* 7 April 2018, at https://www.independent.co.uk/environment/plastic-pollution-killed-sperm-whale-dead-spain-beach-bags-blue-planet-a8293446.html

17 Anna Turns, "Saving the albatross: 'The war is against plastic and they are casualties on the frontline' ", *The Guardian,* 12 March 2018, at https://www.theguardian.com/environment/2018/mar/12/albatross-film-dead-chicks-plastic-saving-birds.

18 Brandie Weikle, "Microplastics found in supermarket fish, shellfish: Researchers say it's too soon to say what impact this has on food safety", *CBC News,* 28 January 2017, at http://www.cbc.ca/news/technology/microplastics-fish-shellfish-1.3954947.

19 Mark Molloy, "Shocking photo shows Caribbean Sea being 'choked to death by human [plastic] waste'", *The Telegraph,* 26 October 2017, at https://www.telegraph.co.uk/news/2017/10/26/shocking-photo-shows-caribbean-sea-choked-death-human-waste/.

20 Matthew Taylor, "$180bn investment in plastic factories feeds global packaging binge: Colossal funding in manufacturing plants by fossil fuel companies will increase plastic production by 40%, risking permanent pollution of the earth", *The Guardian,* 26 December 2017, at https://www.theguardian.com/environment/2017/dec/26/180bn-investment-in-plastic-factories-feeds-global-packaging-binge.

21 Unjustified youthful environmental righteousness towards the older generation is the theme of a humorously ironic short story, "The Green Thing", posted on *Inspirational Christian Stories and Poems,* August 2, 2011, at http://www.inspirationalarchive.com/1103/the-green-thing/.

replaced pride of workmanship in the production of consumer goods, and we have become irresponsible and superficial in our attitudes to the care and preservation of things.

The social media construct of the world in terms of celebrity, simplistic explanations and trending popularity reinforces our indifference except when some image of the damage done by plastic waste goes viral, and even then most of us do not know how to focus our ecological distress and take meaningful action. Recycling is at best a palliative measure when so little plastic can actually be recycled, and it costs taxpayers a lot, while the big companies that create the plastic goods and packaging take no corporate responsibility for cleaning up the resulting plastic waste.

In short, in our use of plastics, both as individuals and as a society, we lack spiritual and moral commitment to the proper management of the world and of its goods. Worse, a society built around disposable plastic lacks any sense of permanence or integrity. Redundant plastic is both a bad lifestyle choice and a social disease, sapping our awareness of what is noble, beautiful and good.

Christian leaders and the care of creation: a crusade against plastics?

Recently there has been a renewed emphasis by Christian leaders on the divine imperative of the care of creation. Gardening is actually the world's oldest profession. From the golden age of the Garden of Eden mankind has been assigned the task of tilling the earth and keeping it safe,[22] and the ideal of Christian civilization still remains the unpolluted garden earth cared for by rational and happy men and women without evil.

The parables of Jesus in the Gospels speak of the steward, or estate manager, as being required to take good care of a property for its landlord during his absence. In modern times Protestant Christianity has emphasized the mission of stewardship as a general requirement for Christians to use responsibly the things of this world. This includes our stewardship of the environment.

In July 2009, Patriarch Kirill of Moscow expressed his concerns "about the state of the environment, as well as mankind's collective soul, saying the economic crisis has lessons to teach us" regarding Western overconsumption and false spiritual values.[23] The patriarch appeared to be following the thinking of an American scholar, Jared Diamond from UCLA, who argued that the greediness of the West for natural resources was unsustainable:

> The average rates at which people consume resources like oils and metals, and produce wastes like **plastics** and greenhouse gases, are about 32 times higher in North America, Western Europe, Japan and Australia than they are in the developing world.[24]

The comparison is striking; greenhouse gases and plastics are both wastes from the bad stewardship (overconsumption) of natural resources.

In the Catholic Church of the Western Middle Ages, St. Francis of Assisi was notable for his love of nature, as expressed especially in his *Canticle of the Sun.* In this hymn Francis cries out repeatedly to the Lord, in an Italian dialect, *Laudato Si'* ("Praised be you"), for all your creatures. The saint's present-day namesake, Pope Francis, used these very words as the title of a major ecological teaching document of the Roman Catholic Church, the encyclical letter *Laudato Si'* of 24 May 2015, subtitled *On Care for our Common Home.*[25]

In chapter 6 of *Laudato Si'*, on "Ecological Education and Spirituality", Pope Francis pays special attention to Christians tackling plastic waste and other environmental problems.

> Education in environmental responsibility can encourage ways of acting which directly and significantly affect the world around us, such as *avoiding the use of plastic* and paper, reducing water consumption, separating refuse, cooking only what can reasonably be consumed, showing care for other living beings, using public transport or car-pooling, planting trees, turning off unnecessary lights, or any number of other practices.[26]

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[22] *Genesis* 2:15.

[23] Robert Bridge, "Russian Patriarch goes green, tells America to curb its reckless consumption", *Russia Today,* 31 July 2009, at https://www.rt.com/news/russian-patriarch-goes-green/.

[24] As quoted by Bridge, *loc. cit.*

[25] Extracts reproduced at the end of this paper.

[26] *Laudato Si',* s. 211 (italics mine).

The Anglican Communion has its own way of investing any modern Christian cause with ancient symbolism. Recent whimsical news stories have reported the Church of England as recommending that its adherents give up the use of plastic for Lent,[27] and plastic bottles being recycled to make clerical clothing.[28]

Healing the social crisis of plastics pollution

Whereas Pope Francis emphasises the practical work of caring for creation, Patriarch Kirill emphasises the spiritual and social alienation caused by overconsumption of natural resources and the worldwide accumulation of plastics waste. The pope's spiritual approach encourages a renewal of social commitment to the proper management of the world and of its goods, while the patriarch's spiritual insight reflects my earlier point that a society built around disposable plastic lacks any sense of permanence or integrity. Plastics pollution has brought about a social crisis, and healing that crisis involves not just a crusade but a conversion of hearts.

To start with, educators need to build a stronger social consensus that plastic waste is a moral issue for everyone. When buying, using or discarding any product that includes plastic, we need to think of the common good and of the moral example we are setting, not just of our own immediate convenience. Segregating plastic waste for separate, ecologically friendly disposal is just one example of behaviours that need to become instinctual.

Unfortunately, suppliers of goods, especially food supermarkets, may offer customers little choice as to their packaging. In Western Europe and North America the last few years have seen a remarkable increase of packaging into small plastic boxes of produce formerly sold separately. Plastic is lighter in weight than the glass, pottery or metal containers or bulk wooden crates that used to be used for long distance shipping of produce, and it does not so easily break or dent, so a continental food distribution system encourages such standardisation. Citizens and governments have to take measures which provide for genuine choice of environmentally friendly packaging or no packaging at all in the marketplace. These may have to include boycotts or regulations.[29]

One school of thought thinks that plastic items should carry an extra environmental cleanup tax; another favours complete local bans on the sale of such items as plastic shopping bags or plastic straws. I myself prefer to use the power of example and persuasion; for over ten years I have gone shopping with a big cloth carry bag bearing the legend "Stop using plastic bags." It is a great talking point for impromptu educational moments!

Making companies pay the cleanup costs of the waste they ultimately generate through their profligate sales of plastic goods or goods in plastic packaging is another important long-term objective for education and national legislation.

Finally, the social healing of the world plastics crisis must involve political action by ecologically responsible citizens to force their governments to undertake international action against plastics waste. Under public pressure at home to lessen the glut of plastic packaging and plastic pollution of its seacoasts, for example, Britain has recently taken the lead in setting up an international program against plastic waste in the oceans. New Zealand, Sri Lanka, Vanuatu, and Ghana have already signed up to Britain's new Commonwealth Clean Oceans Alliance.[30]

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[27] Lucy Pasha-Robinson, "Church of England issues Lent commandments to reduce plastic waste: 'Avoid the mini bar'. Worshippers warned against hotel drinks and snacks: 'Not only are they incredibly expensive but they all come in plastic bottles'", *The Independent,* 15 February 2018, at https://www.independent.co.uk/news/uk/home-news/church-of-england-plastic-waste-commandments-lent-pollution-easter-a8212191.html.

[28] Olivia Rudgard, "Clergy buy cassocks recycled from bottles as Church of England joins war on plastic", *The Telegraph,* 26 May 2018, at https://www.telegraph.co.uk/news/2018/05/26/clergy-buy-cassocks-recycled-bottles-church-england-joins-war/.

[29] Sandra Laville and Matthew Taylor, "Nearly 1m tonnes every year: supermarkets shamed for plastic packaging", *The Guardian,* 17 January 2018, at https://www.theguardian.com/environment/2018/jan/17/nearly-1m-tonnes-every-year-supermarkets-shamed-for-plastic-packaging; Matthew Taylor, "The plastic-free stores showing the big brands how to do it", *The Guardian,* 17 January 2018, at https://www.theguardian.com/world/2018/jan/17/the-plastic-free-stores-showing-the-big-brands-how-to-do-it; Peter Walker, "Theresa May proposes plastic-free supermarket aisles in green strategy: [UK] PM declares war on scourge of plastic waste as she unveils much-heralded 25-year environmental plan", *The Guardian,* 11 January 2018, at https://www.theguardian.com/environment/2018/jan/10/theresa-may-proposes-plastic-free-supermarket-aisles-in-green-strategy.

[30] Edward Malnick, "Theresa May announces £60 million fund to tackle scourge of plastic in world's oceans", *The Telegraph,* 14 April 2018, at https://www.telegraph.co.uk/news/2018/04/14/may-announces-60-million-fund-tackle-scourge-plastic-worlds/;

The United Nations Environment Program (UNEP) headquartered in Nairobi holds World Environmental Assemblies every two years or so. It has had the problem of oceanic plastic pollution on its agenda since 2014 but has not yet really come to grips with it due to the blocking of consensus on strong action by the United States, the largest maker of plastic.[31] A hopeful sign is the appointment by the latest Environmental Assembly of an ad hoc expert group to deal with marine plastic debris and microplastic pollution. This group met on 29-31 May 2018 to consider a remarkably forthright and comprehensive briefing note on the crisis prepared by the UNEP Secretariat, rather than to hear the usual political speeches.[32]

The ecological citizens of the world will be watching.

Government of the UK, "Commonwealth unites to end scourge of plastic: Countries from across the Commonwealth have today pledged to eliminate avoidable single use plastic in an ambitious bid to clean up the world's oceans", press release, 15 April 2018, at https://www.gov.uk/government/news/commonwealth-unites-to-end-scourge-of-plastic.

[31] Roger Harrabin, "UN commits to stop ocean plastic waste [non-binding resolution]", *BBC News,* 5 December 2017, at http://www.bbc.com/news/science-environment-42239895.

[32] *Barriers to combating marine litter and microplastics, including challenges related to resources in developing countries,* https://papersmart.unon.org/resolution/uploads/unep_aheg_2018_1_2_barriers.pdf.

ENCYCLICAL LETTER
LAUDATO SI'
OF THE HOLY FATHER
FRANCIS
ON CARE FOR OUR COMMON HOME

24 May 2015

1. "LAUDATO SI', mi' Signore" – "Praise be to you, my Lord". In the words of this beautiful canticle, Saint Francis of Assisi reminds us that our common home is like a sister with whom we share our life and a beautiful mother who opens her arms to embrace us. "Praise be to you, my Lord, through our Sister, Mother Earth, who sustains and governs us, and who produces various fruit with coloured flowers and herbs".[1]

2. This sister now cries out to us because of the harm we have inflicted on her by our irresponsible use and abuse of the goods with which God has endowed her. We have come to see ourselves as her lords and masters, entitled to plunder her at will. The violence present in our hearts, wounded by sin, is also reflected in the symptoms of sickness evident in the soil, in the water, in the air and in all forms of life. This is why the earth herself, burdened and laid waste, is among the most abandoned and maltreated of our poor; she "groans in travail" (Rom 8:22). We have forgotten that we ourselves are dust of the earth (cf. Gen 2:7); our very bodies are made up of her elements, we breathe her air and we receive life and refreshment from her waters.

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CHAPTER SIX

ECOLOGICAL EDUCATION AND SPIRITUALITY

202. Many things have to change course, but it is we human beings above all who need to change. We lack an awareness of our common origin, of our mutual belonging, and of a future to be shared with everyone. This basic awareness would enable the development of new convictions, attitudes and forms of life. A great cultural, spiritual and educational challenge stands before us, and it will demand that we set out on the long path of renewal.

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209. An awareness of the gravity of today's cultural and ecological crisis must be translated into new habits. Many people know that our current progress and the mere amassing of things and pleasures are not enough to give meaning and joy to the human heart, yet they feel unable to give up what the market sets before them. In those countries which should be making the greatest changes in consumer habits, young people have a new ecological sensitivity and a generous spirit, and some of them are making admirable efforts to protect the environment. At the same time, they have grown up in a milieu of extreme consumerism and affluence which makes it difficult to develop other habits. We are faced with an educational challenge.

210. Environmental education has broadened its goals. Whereas in the beginning it was mainly centred on scientific information, consciousness-raising and the prevention of environmental risks, it tends now to include a critique of the "myths" of a modernity grounded in a utilitarian mindset (individualism, unlimited progress, competition, consumerism, the unregulated market). It seeks also to restore the various levels of ecological equilibrium, establishing harmony within ourselves, with others, with nature and other living creatures, and with God. Environmental education should facilitate making the leap towards the transcendent which gives ecological ethics its deepest meaning. It needs educators capable of developing an ethics of ecology, and helping people, through effective pedagogy, to grow in solidarity, responsibility and compassionate care.

211. Yet this education, aimed at creating an "ecological citizenship", is at times limited to providing information, and fails to instil good habits. The existence of laws and regulations is insufficient in the long run to curb bad conduct, even when effective means of enforcement are present. If the laws are to bring about significant, long-lasting effects, the majority of the members of society must be adequately motivated to accept them, and personally transformed to respond. Only by cultivating sound virtues will people be able to make a selfless ecological commitment. A person who could afford to spend and

consume more but regularly uses less heating and wears warmer clothes, shows the kind of convictions and attitudes which help to protect the environment. There is a nobility in the duty to care for creation through little daily actions, and it is wonderful how education can bring about real changes in lifestyle. Education in environmental responsibility can encourage ways of acting which directly and significantly affect the world around us, such as avoiding the use of plastic and paper, reducing water consumption, separating refuse, cooking only what can reasonably be consumed, showing care for other living beings, using public transport or car-pooling, planting trees, turning off unnecessary lights, or any number of other practices. All of these reflect a generous and worthy creativity which brings out the best in human beings. Reusing something instead of immediately discarding it, when done for the right reasons, can be an act of love which expresses our own dignity.

212. We must not think that these efforts are not going to change the world. They benefit society, often unbeknown to us, for they call forth a goodness which, albeit unseen, inevitably tends to spread. Furthermore, such actions can restore our sense of self-esteem; they can enable us to live more fully and to feel that life on earth is worthwhile.

213. Ecological education can take place in a variety of settings: at school, in families, in the media, in catechesis and elsewhere. Good education plants seeds when we are young, and these continue to bear fruit throughout life. Here, though, I would stress the great importance of the family, which is "the place in which life – the gift of God – can be properly welcomed and protected against the many attacks to which it is exposed, and can develop in accordance with what constitutes authentic human growth. In the face of the so-called culture of death, the family is the heart of the culture of life".[149] In the family we first learn how to show love and respect for life; we are taught the proper use of things, order and cleanliness, respect for the local ecosystem and care for all creatures. In the family we receive an integral education, which enables us to grow harmoniously in personal maturity. In the family we learn to ask without demanding, to say "thank you" as an expression of genuine gratitude for what we have been given, to control our aggressivity and greed, and to ask forgiveness when we have caused harm. These simple gestures of heartfelt courtesy help to create a culture of shared life and respect for our surroundings.

214. Political institutions and various other social groups are also entrusted with helping to raise people's awareness. So too is the Church. All Christian communities have an important role to play in ecological education. It is my hope that our seminaries and houses of formation will provide an education in responsible simplicity of life, in grateful contemplation of God's world, and in concern for the needs of the poor and the protection of the environment. Because the stakes are so high, we need institutions empowered to impose penalties for damage inflicted on the environment. But we also need the personal qualities of self-control and willingness to learn from one another.

215. In this regard, "the relationship between a good aesthetic education and the maintenance of a healthy environment cannot be overlooked".[150] By learning to see and appreciate beauty, we learn to reject self-interested pragmatism. If someone has not learned to stop and admire something beautiful, we should not be surprised if he or she treats everything as an object to be used and abused without scruple. If we want to bring about deep change, we need to realize that certain mindsets really do influence our behaviour. Our efforts at education will be inadequate and ineffectual unless we strive to promote a new way of thinking about human beings, life, society and our relationship with nature. Otherwise, the paradigm of consumerism will continue to advance, with the help of the media and the highly effective workings of the market.