

# ECO MODERNIST MANIFESTO

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# 1. The Anthropocene

## The Earth has become a very human planet.

To say that the Earth is a human planet becomes truer every day. Humans are made from the Earth, and the Earth is remade by human hands. Many earth scientists express this by stating that the Earth has entered a new geological epoch: the Anthropocene, the Age of Humans.

## A good Anthropocene means better lives for people, a stable climate and the natural world protected.

As scholars, scientists, campaigners, and citizens, we write with the conviction that knowledge and technology, applied with wisdom, might allow for a good, or even great, Anthropocene. A good Anthropocene demands that humans use their growing social, economic, and technological powers to make life better for people, stabilize the climate, and protect the natural world.

## Shrinking our impact on nature does not require us all to harmonise with it.

In this, we affirm one long-standing environmental ideal, that humanity must shrink its impacts on the environment to make more room for nature, while we reject another, that human societies must harmonize with nature to avoid economic and ecological collapse. These two ideals can no longer be reconciled. Natural systems will not, as a general rule, be protected or enhanced by the expansion of humankind's dependence upon them for sustenance and well-being.

## Instead, environmental protection is enabled by making human activities more productive.

Intensifying many human activities — particularly farming, energy extraction, forestry, and settlement — so that they use less land and interfere less with the natural world is the key to decoupling human development from environmental impacts. These socioeconomic and technological processes are central to economic modernization and environmental protection. Together they allow people to mitigate climate change, to spare nature, and to alleviate global poverty.

## This is the Ecomodernist vision.

Although we have to date written separately, our views are increasingly discussed as a whole. We call ourselves eco-pragmatists and ecomodernists. We offer this statement to affirm and to clarify our views and to describe our vision for putting humankind's extraordinary powers in the service of creating a good Anthropocene.

## Humanity has flourished.

Over the past two centuries average life expectancy has increased from 30 to 70 years, resulting in a large and growing population able to live in many different environments. Humanity has made extraordinary progress in reducing the incidence and impacts of infectious diseases, and it has become more resilient to extreme weather and other natural disasters.

## Today's societies are safer and freer than ever.

Violence in all forms has declined significantly and is probably at the lowest per capita level ever experienced by the human species, the horrors of the 20th century and present-day terrorism notwithstanding. Globally, human beings have moved from autocratic government toward liberal democracy characterized by the rule of law and increased freedom. Personal, economic, and political liberties have spread worldwide and are today largely accepted as universal values. Modernization liberates women from traditional gender roles, increasing their control of their fertility. Historically large numbers of humans — both in percentage and in absolute terms — are free from insecurity, penury, and servitude.

## But human flourishing is seriously damaging the world's ecosystems.

At the same time, human flourishing has taken a serious toll on natural, nonhuman environments and wildlife. Humans use about half of the planet's ice-free land, mostly for pasture, crops, and production forestry. Of the land once covered by forests, 20 percent has been converted to human use. Populations of many mammals, amphibians, and birds have declined by more than 50 percent in the past 40 years alone. More than 100 species

from those groups went extinct in the 20th century, and about 785 since 1500. As we write, only four northern white rhinos are confirmed to exist.

### How do we flourish in a damaged biosphere?

Given that humans are completely dependent on the living biosphere, how is it possible that people are doing so much damage to natural systems without doing more harm to themselves?

### Technology has reduced per-capita impact on natural eco-systems.

The role that technology plays in reducing humanity's dependence on nature explains this paradox. Human technologies, from those that first enabled agriculture to replace hunting and gathering, to those that drive today's globalized economy, have made humans less reliant upon the many ecosystems that once provided their only sustenance, even as those same ecosystems have often been left deeply damaged.

### There are no real limits to the growth of human consumption.

Despite frequent assertions starting in the 1970s of fundamental "limits to growth," there is still remarkably little evidence that human population and economic expansion will outstrip our capacity to grow food or procure critical material resources in the foreseeable future.

### We have what we need to flourish for millennia.

The idea of fixed physical boundaries to human consumption is so theoretical as to be functionally irrelevant. The amount of solar radiation that hits the Earth for instance, is ultimately finite but represents no meaningful constraint upon human endeavours. Human civilization can flourish for centuries and millennia on energy delivered from a closed uranium or thorium fuel cycle, or perhaps from hydrogen-deuterium fusion. With proper management, humans are at no risk of lacking sufficient agricultural land for food. Given plentiful land and unlimited energy substitutes, if material inputs needed for human well-being become scarce or expensive others can easily be found.

### However, serious long term threats loom.

There remain, however, serious long-term environmental threats to human well-being, such as anthropogenic climate change, stratospheric ozone depletion, and ocean acidification. While these risks are difficult to quantify, the evidence is clear today that they could cause significant risk of catastrophic impacts on societies and ecosystems. Even gradual, non-catastrophic outcomes associated with these threats are likely to result in significant human and economic costs as well as rising ecological losses.

### Many people suffer from immediate local environmental problems.

Much of the world's population still suffers from more-immediate local environmental health risks. Indoor and outdoor air pollution continue to bring premature death and illness to millions annually. Water pollution and water-borne illness due to pollution and degradation of watersheds cause similar suffering.

## 2 Long Term Decoupling from Natural Ecosystems

Even as human environmental impacts continue to grow in the aggregate, a range of long-term trends are today driving significant decoupling of human well-being from environmental impacts.

### Relative and absolute decoupling...

Decoupling occurs in both relative and absolute terms. Relative decoupling means that human environmental impacts rise at a slower rate than overall economic growth. Thus, for each unit of economic output, less environmental impact (e.g., deforestation, defaunation, pollution) results. Overall impacts may still increase, just at a slower rate than would otherwise be the case. Absolute decoupling occurs when total environmental impacts — impacts in the aggregate — peak and begin to decline, even as the economy continues to grow.

### ...is driven by technological and demographic trends.

Decoupling can be driven by both technological and demographic trends and usually results from a combination of the two.

### Human populations are peaking.

The growth rate of the human population has already peaked. Today's population growth rate is one percent per year, down from its high point of 2.1 percent in the 1970s. Fertility rates in countries containing more than half of the global population are now below replacement level. Population growth today is primarily driven by longer life spans and lower infant mortality, not by rising fertility rates. Given current trends, it is very possible that the size of the human population will peak this century and then start to decline.

### Cities engender lower human fertility...

Trends in population are inextricably linked to other demographic and economic dynamics. For the first time in human history over half the global population lives in cities. By 2050, 70 percent are expected to dwell in cities, a number that could rise to 80 percent or more by the century's end. Cities are characterized by both dense populations and low fertility rates.

### ...and decouple human impact on nature.

Cities occupy just one to three percent of the Earth's surface and yet are home to nearly four billion people. As such, cities both drive and symbolize the decoupling of humanity from nature, performing far better than rural economies in providing efficiently for material needs while reducing environmental impacts.

### Efficient agriculture has enabled the growth of cities.

The growth of cities along with the economic and ecological benefits that come with them are inseparable from improvements in agricultural productivity. As agriculture has become more land and labor efficient, rural populations have left the countryside for the cities. Roughly half the US population worked the land in 1880. Today, less than 2 percent does.

### Subsistence farming does not support modern standards of living.

As human lives have been liberated from hard agricultural labor, enormous human resources have been freed up for other endeavours. Cities, as people know them today, could not exist without radical changes in farming. In contrast, modernization is not possible in a subsistence agrarian economy.

### Per-capita use of land for agriculture has vastly reduced...

These improvements have resulted not only in lower labor requirements per unit of agricultural output but also in lower land requirements. It is not a new trend: rising harvest yields have for millennia reduced the amount of land required to feed the average person. The average per-capita use of land today is vastly lower than it was 5,000 years ago, despite the fact that modern people enjoy a far richer diet. Thanks to technological improvements in agriculture, during the half-century starting in the mid-1960s, the amount of land required for growing crops and animal feed for the average person declined 50 percent.

### ...enabling reforestation.

Agricultural intensification, along with the move away from the use of wood as fuel, has allowed many parts of the world to experience net reforestation. About 80 percent of New England is today forested, compared with about 50 percent at the end of the 19th century. Over the past 20 years, the amount of land dedicated to production forest worldwide declined by 50 million hectares, an area the size of France. The "forest transition" from net deforestation to net reforestation seems to be as resilient a feature of development as the demographic transition that reduces human birth rates as poverty declines.

### Peaking resource use...

Human use of many other resources is similarly peaking. The amount of water needed for the average diet has declined by nearly 25 percent over the past half-century. Nitrogen pollution continues to cause eutrophication and large dead zones in places like the Gulf of Mexico. While the total amount of nitrogen pollution is rising, the amount used per unit of production has declined significantly in developed nations.

### ... and peaking consumption...

Indeed, in contradiction to the often-expressed fear of infinite growth colliding with a finite planet, demand for many material goods may be saturating as societies grow wealthier. Meat consumption, for instance, has peaked in many wealthy nations and has shied away from beef toward protein sources that are less land intensive.

### ...have led to employment sectors that use less natural resources...

As demand for material goods is met, developed economies see higher levels of spending directed to materially less-intensive service and knowledge sectors, which account for an increasing share of economic activity. This dynamic might be even more pronounced in today's developing economies, which may benefit from being late adopters of resource-efficient technologies.

### ... providing opportunities to re-wild and re-green.

Taken together, these trends mean that the total human impact on the environment, including land-use change, overexploitation, and pollution, can peak and decline this century. By understanding and promoting these emergent processes, humans have the opportunity to re-wild and re-green the Earth — even as developing countries achieve modern living standards, and material poverty ends.

## 3 Liberating the Environment from Human Impacts

The processes of decoupling described above challenge the idea that early human societies lived more lightly on the land than do modern societies. Insofar as past societies had less impact upon the environment, it was because those societies supported vastly smaller populations.

### Early humans each needed far more land than the average person today.

In fact, early human populations with much less advanced technologies had far larger individual land footprints than societies have today. Consider that a population of no more than one or two million North Americans hunted most of the continent's large mammals into extinction in the late Pleistocene (around 12,000 years ago), while burning and clearing forests across the continent in the process. Extensive human transformations of the environment continued throughout the subsequent Holocene period: as much as three-quarters of all deforestation globally occurred before the Industrial Revolution.

### Recoupling human societies to nature would be disastrous.

The technologies that humankind's ancestors used to meet their needs supported much lower living standards with much higher per-capita impacts on the environment. Absent a massive human die-off, any large-scale attempt at recoupling human societies to nature using these technologies would result in an unmitigated ecological and human disaster.

### Excessive human dependence on natural environments degrades them.

Ecosystems around the world are threatened today because people over-rely on them: people who depend on firewood and charcoal for fuel cut down and degrade forests; people who eat bush meat for food hunt mammal species to local extirpation. Whether it's a local indigenous community or a foreign corporation that benefits, it is the continued dependence of humans on natural environments that is the problem for the conservation of nature.

### Modern technologies can reduce human impacts, ...

Conversely, modern technologies, by using natural ecosystem flows and services more efficiently, offer a real chance of reducing the totality of human impacts on the biosphere. To embrace these technologies is to find paths to a good Anthropocene.

...notwithstanding modern processes have made possible bigger human populations and consumption.

The modernization processes that have increasingly liberated humanity from nature are, of course, double-edged, since they have also degraded the natural environment. Fossil fuels, mechanization and manufacturing, synthetic fertilizers and pesticides, electrification and modern transportation and communication technologies, have made larger human populations and greater consumption possible in the first place. Had technologies not improved since the Dark Ages, no doubt the human population would not have grown much either.

Today's urban populations enjoy the most land efficient fruits of globalization ever.

It is also true that large, increasingly affluent urban populations have placed greater demands upon ecosystems in distant places — the extraction of natural resources has been globalized. But those same technologies have also made it possible for people to secure food, shelter, heat, light, and mobility through means that are vastly more resource- and land-efficient than at any previous time in human history.

Increased decoupling will require conscious acceleration of technological substitutes.

Decoupling human well-being from the destruction of nature requires the conscious acceleration of emergent decoupling processes. In some cases, the objective is the development of technological substitutes. Reducing deforestation and indoor air pollution requires the substitution of wood and charcoal with modern energy.

In other cases, humanity's goal should be to use resources more productively...

For example, increasing agricultural yields can reduce the conversion of forests and grasslands to farms.

...to allow more room for non-human species.

Suburbanization, low-yield farming, and many forms of renew-able energy production generally require more land and resources and leave less room for nature. In contrast, urbanization, agricultural intensification, nuclear power, aquaculture, and desalination are all processes with a demonstrated potential to reduce human demands on the environment, allowing more room for non-human species.

Nature unneeded, is nature spared.

These patterns suggest that humans are as likely to spare nature because it is not needed to meet their needs as they are to spare it for explicit aesthetic and spiritual reasons. The parts of the planet that people have not yet profoundly transformed have mostly been spared because they have not yet found an economic use for them — mountains, deserts, boreal forests, and other “marginal” lands. Decoupling raises the possibility that societies might achieve peak human impact without intruding much further on relatively untouched areas. Nature unused is nature spared.

## 4 Decarbonizing Energy

Plentiful modern energy is needed to decouple economic development from nature.

The availability of inexpensive energy allows poor people around the world to stop using forests for fuel. It allows humans to grow more food on less land, thanks to energy-heavy inputs such as fertilizer and tractors. Energy allows humans to recycle waste water and desalinate seawater, enabling rivers and aquifers to be spared. It allows humans to cheaply recycle metal and plastic rather than having to mine and refine these minerals. Looking forward, modern energy may allow the capture of carbon from the atmosphere and/or seawater to draw down the accumulated carbon that is driving global warming.

Climate mitigation will require rapid decarbonization of energy.

However, for at least the past three centuries, rising energy production globally has been matched by rising atmospheric concentrations of carbon dioxide. Nations have also been slowly decarbonizing — that is, reducing the carbon intensity of their economies — over that same time period. But they have not been doing so at a rate consistent with keeping cumulative carbon emissions low enough to reliably stay below the international target of less than 2°C of global warming. Significant climate mitigation, therefore, will require that humans rapidly accelerate existing processes of decarbonization.

### Energy consumption will continue to rise...

There remains much confusion, however, as to how this might be accomplished. In developing countries, rising energy consumption is tightly correlated with rising incomes and improving living standards. Although the use of many other material resource inputs such as nitrogen, timber, and land are beginning to peak, the centrality of energy in human development - and its many uses as a substitute for material and human resources - suggest that energy consumption will continue to rise through much if not all of the 21st century.

### ...because billions of people aspire to modern living standards.

For that reason, any conflict between climate mitigation and the continuing development process through which billions of people around the world are achieving modern living standards will continue to be resolved resoundingly in favour of the latter.

### Global ecological challenges are not the pressing concern for most people, for good reason.

Climate change and other global ecological challenges are not the most important immediate concerns for the majority of the world's people. Nor should they be. A new coal-fired power station in Bangladesh may bring air pollution and rising carbon dioxide emissions but will also save lives. For millions living without light and forced to burn dung to cook their food, electricity and modern fuels, no matter the source, offer a pathway to a better life, even as they also bring new environmental challenges.

### Climate mitigation will require a fundamental change in energy production technology.

By this we mean that even dramatic limits to per capita global consumption would be insufficient to achieve significant climate mitigation. Absent profound technological change there is no credible path to meaningful climate mitigation. While advocates differ in the particular mix of technologies they favour, we are aware of no quantified climate mitigation scenario in which technological change is not required to cut the vast majority of emissions.

### People often fail to account for the cost and required scale of their preferred energy technologies.

The specific technological paths that people might take toward climate mitigation remain deeply contested. Theoretical scenarios for climate mitigation typically reflect their creators' technological preferences and analytical assumptions, while all too often failing to account for the cost, rate, and scale at which low-carbon energy technologies can be deployed.

### Most societies have decarbonised by switching to less carbon intensive, higher density fuels.

The history of energy transitions, however, suggests that there have been consistent patterns associated with the ways that societies move toward cleaner sources of energy. Substituting higher-quality (i.e., less carbon-intensive, higher-density) fuels for lower-quality (i.e., more carbon-intensive, lower-density) ones is how virtually all societies have decarbonized, and points the way toward accelerated decarbonization in the future. Powering a growing human economy with largely zero-carbon energy sources will require transitioning to technologies that are power dense and capable of scaling to many tens of terawatts.

### Most forms of renewable energy are insufficiently scalable in practice.

The scale of land use and other environmental impacts necessary to power the world on biofuels or many other renewables are such that we doubt they provide a sound pathway to a zero-carbon low-footprint future.

### Albeit solar power might become an exception.

High-efficiency solar cells produced from earth-abundant materials are an exception and have the potential to provide many tens of terawatts on a few percent of the Earth's surface. Present-day solar technologies will require substantial innovation to meet this standard, as will the development of cheap energy storage technologies capable of dealing with highly variable energy generation at large scales.

### However, "Generation 4" nuclear power will probably be needed to stabilise the climate.

Nuclear fission today represents the only present-day zero-carbon technology with the demonstrated ability to meet most, if not all, of the energy demands of a modern economy. However, a variety of social, economic, and

institutional challenges make deployment of present-day nuclear technologies at scales necessary to achieve significant climate mitigation unlikely. A new generation of nuclear technologies that are safer and cheaper will likely be necessary for nuclear energy to meet its full potential as a critical climate mitigation technology.

#### Less ideal low-carbon energy could provide for the interim.

In the long run, next-generation solar, advanced nuclear fission, and perhaps nuclear fusion represent the most plausible pathways toward the joint goals of climate stabilization and radical decoupling of humans from nature. If the history of energy transitions is any guide however, that transition will take time. During that transition, other energy technologies can provide important social and environmental benefits. Hydroelectric dams, for example, may be a cheap source of low-carbon power for poor nations even though their land and water footprint is relatively large. Fossil fuels with carbon capture and storage could likewise provide substantial environmental benefits over current fossil or biomass energies.

#### Rapid transition will require sustained public support.

The ethical and pragmatic path toward a just and sustainable global energy economy requires that human beings transition as rapidly as possible to energy sources that are cheap, near-zero carbon, dense, and abundant. Such a path will require sustained public support for these technologies to be developed and deployed, both within nations and globally through international collaboration/competition within a broader framework.

## 5 Spiritual connection to the natural world

#### Nature is important for psychological and spiritual well-being.

We write this document out of deep love and emotional connection to the natural world. By appreciating, exploring, seeking to understand, and cultivating nature, many people get outside themselves. They connect with their deep evolutionary history. Even people who never directly experience these wild natures often affirm their existence as important for their psychological and spiritual well-being.

#### Decoupling enables less destruction of nature.

Humans will always materially depend on nature to some degree. Even if a fully synthetic world were possible, many of us might still choose to continue to live more coupled with nature than human sustenance and technologies require. What decoupling offers is the possibility that humanity's material dependence upon nature might be less destructive.

#### Is it fair to deny future generations today's biodiversity?

The case for a more active, conscious, and accelerated decoupling to spare nature draws more on spiritual or aesthetic than on material or utilitarian arguments. Current and future generations could survive and prosper materially on a planet with much less biodiversity and wild nature. But this is not a world we want nor, if humans embrace decoupling processes, need to accept.

#### Conservation science alone cannot indicate what to preserve.

What we are here calling nature, or even wild nature, encompasses landscapes, seascapes, biomes and ecosystems that have, in more cases than not, been regularly altered by human influences over centuries and millennia. Conservation science, and the concepts of biodiversity, complexity, and indigeneity are useful, but alone cannot determine which landscapes to preserve, or how.

#### There is no credible 'baseline' to which nature should be restored.

In most cases, there is no single baseline prior to human modification to which nature might be returned. For example, efforts to restore landscapes to more closely resemble earlier states ("indigeneity") may involve removing recently arrived species ("invasives") and thus require a net reduction in local biodiversity. In other circumstances, communities may decide to sacrifice indigeneity for novelty and biodiversity.

### We must choose which ecosystems to re-wild.

Explicit efforts to preserve landscapes for their non-utilitarian value are inevitably anthropogenic choices. For this reason, all conservation efforts are fundamentally anthropogenic. The setting aside of wild nature is no less a human choice, in service of human preferences, than bulldozing it. Humans will save wild places and landscapes by convincing our fellow citizens that these places, and the creatures that occupy them, are worth protecting. People may choose to have some services — like water purification and flood protection — provided for by natural systems, such as forested watersheds, reefs, marshes, and wetlands, even if those natural systems are more expensive than simply building water treatment plants, seawalls, and levees. There will be no one-size-fits-all solution.

### Wild nature can be protected on land less intensively farmed.

Environments will be shaped by different local, historical, and cultural preferences. While we believe that agricultural intensification for land-sparing is key to protecting wild nature, we recognize that many communities will continue to opt for land-sharing, seeking to conserve wildlife within agricultural landscapes, for example, rather than allowing it to revert to wild nature in the form of grasslands, scrub, and forests. Where decoupling reduces pressure on landscapes and ecosystems to meet basic human needs, landowners, communities, and governments still must decide to what aesthetic or economic purpose they wish to dedicate those lands.

### Movements demanding more wild nature should be encouraged.

Accelerated decoupling alone will not be enough to ensure more wild nature. There must still be a conservation politics and a wilderness movement to demand more wild nature for aesthetic and spiritual reasons. Along with decoupling humankind's material needs from nature, establishing an enduring commitment to preserve wilderness, biodiversity, and a mosaic of beautiful landscapes will require a deeper emotional connection to them.

## 6 A Context for Modernisation

### We affirm the need for effective decoupling policies.

We affirm the need and human capacity for accelerated, active, and conscious decoupling. Technological progress is not inevitable. Decoupling environmental impacts from economic outputs is not simply a function of market-driven innovation and efficient response to scarcity. The long arc of human transformation of natural environments through technologies began well before there existed anything resembling a market or a price signal. Thanks to rising demand, scarcity, inspiration, and serendipity, humans have remade the world for millennia.

### It is for national and local institutions to make responsible choices.

Technological solutions to environmental problems must also be considered within a broader social, economic, and political context. We think it is counterproductive for nations like Germany and Japan, and states like California, to shutter nuclear power plants, recarbonize their energy sectors, and recouple their economies to fossil fuels and biomass. However, such examples underscore clearly that technological choices will not be determined by remote international bodies but rather by national and local institutions and cultures.

### Modernization does not mean increased capitalism and corporate power.

Too often, modernization is conflated, both by its defenders and critics, with capitalism, corporate power, and laissez-faire economic policies. We reject such reductions. What we refer to when we speak of modernization is the long-term evolution of social, economic, political, and technological arrangements in human societies toward vastly improved material well-being, public health, resource productivity, economic integration, shared infrastructure, and personal freedom.

### Modernization liberates people.

Modernization has liberated ever more people from lives of poverty and hard agricultural labor, women from chattel status, children and ethnic minorities from oppression, and societies from capricious and arbitrary governance. Greater resource productivity associated with modern socio-technological systems has allowed human societies to meet human needs with fewer resource inputs and less impact on the environment. More-productive economies are wealthier economies, capable of better meeting human needs while committing more of their economic surplus to non-economic amenities, including better human health, greater human freedom and opportunity, arts, culture, and the conservation of nature.

### Sustained commitment is needed...

Modernizing processes are far from complete, even in advanced developed economies. Material consumption has only just begun to peak in the wealthiest societies. Decoupling of human welfare from environmental impacts will require a sustained commitment to technological progress and the continuing evolution of social, economic, and political institutions alongside those changes.

### ...from both private and public sectors, and internationally.

Accelerated technological progress will require the active, assertive, and aggressive participation of private sector entrepreneurs, markets, civil society, and the state. While we reject the planning fallacy of the 1950s, we continue to embrace a strong public role in addressing environmental problems and accelerating technological innovation, including research to develop better technologies, subsidies, and other measures to help bring them to market, and regulations to mitigate environmental hazards. And international collaboration on technological innovation and technology transfer is essential in the areas of agriculture and energy.

## 7 A Great Anthropocene

### An ecologically vibrant planet is now inseparable from human prosperity.

We offer this statement in the belief that both human prosperity and an ecologically vibrant planet are not only possible but also inseparable. By committing to the real processes, already underway, that have begun to decouple human well-being from environmental destruction, we believe that such a future might be achieved. As such, we embrace an optimistic view toward human capacities and the future.

### Let's eschew dogmatism and encourage a dialogue of pluralism and tolerance...

It is our intention that this document contributes to an improvement in the quality and tenor of the dialogue about how to protect the environment in the 21st century. Too often discussions about the environment have been dominated by the extremes, and plagued by dogmatism, which in turn fuels intolerance.

### ...in service of creating a great Anthropocene.

We value the liberal principles of democracy, tolerance, and pluralism in themselves, and affirm them as keys to achieving a great Anthropocene. We intend that this statement advances today's dialogue about how best to achieve universal human dignity on a biodiverse and thriving planet.

(Draft edition. Paragraph headings added by Clive Elsworth, 24 Jan 2017. [Clive@EndorphinSoftware.co.uk](mailto:Clive@EndorphinSoftware.co.uk))