


Michael Rosenberger

Christian Ethics of Creation

On the Path of Ecological Conversion



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Foreword

I confess that I was granted the grace of a favourable year of birth: For I was able to experience my youth in the 1970s, the time when environmental awareness in Germany experienced its first major springtime. Ecological thinking was therefore passed on to me not only through my nature-loving family, but also through the social developments of that time, which have shaped me to this day.

Environmental protection at that time was mainly focused on resource issues—global warming was not yet known about, and the biodiversity problem was known about, but not in its global dimension. So, for countless classmates I became the middleman of recycled paper, which was not yet available in stationery shops at that time. As the son of parents who had no car and no driver's licence, I forwent getting a driving licence and a car at the age of 18 and travelled to meetings and weekend events organised by the Catholic youth association, even over medium distances, mostly by bicycle. My first letters to the editor in regional newspapers also date back to this time, on questions of transport policy and against the Grafenrheinfeld nuclear power plant, which was under construction at the time.

In my first years as a priest, I was able to build well on my earlier experiences. Working in regional environmental initiatives enriched my career greatly, and some contacts from that time have remained until today. While we had to bury the Lohr–Marktheidenfeld–Wertheim railway line at the end of 1990 in a symbolic act because its demolition was to begin a few days later, we were ultimately able to save the Saale Valley Railway between Gemünden, Hammelburg and Bad Kissingen through numerous activities in the years 1993 to 1996—although some of our demands at that time to make transport on this line more attractive are only now being realised. The decades-long commitment to the Hafenlohr valley, to which I could only make a very small contribution, was also ultimately successful. Parallel to this, I was able to get involved in the environmental work of the diocese of Würzburg and support developments there, the fruits of which can still be seen today.

So, I felt it was a lucky coincidence that my habilitation supervisor, Prof. Dr Bernhard Fraling (1929–2013), recommended that I write my habilitation thesis on "Care for Creation in the Conciliar Process of the

Christian Churches 1983–1989" (Michael Rosenberger 2001). In terms of content, for me this meant coming home to a familiar world and the opportunity to combine my two great heartfelt concerns—the Christian faith and environmental protection—in an academic way.

Since then, the themes of Christian environmental ethics have run through my academic research and teaching. In great interdisciplinarity, research projects and working groups emerged that broadened my horizons enormously, but in which I was also able to experience that the specific contribution of theological ethics is desired and recognised as important. I am very grateful for the collegial cooperation and human esteem that characterise(d) these groups.

In addition to my academic work, since 2004 I have been able to support the environmental work of the Diocese of Linz internally and maintain many contacts with the environmental movement externally. Remarkable projects have emerged from this, both within and outside the church. In this context, I quickly made contact with Fridays for Future Upper Austria in March 2019 and was involved in the founding of Scientists for Future Upper Austria and Religions for Future Austria.

This book is therefore indebted to countless people, whose names would never end and would always remain incomplete, which is why I refrain from mentioning them. Those I am referring to, please feel addressed.

A few days before the completion of my manuscript, "Christian Environmental Ethics" by my colleague Markus Vogt, with whom I have been associated for about 25 years, was published by Herder-Verlag. Due to the different theological subjects for which we are responsible—Markus Vogt for Christian social ethics, I for moral theology—we have very different approaches to the topic. The difference in approach, however, is mutually enriching due to the great agreement in our professional assessments. Thus, it is only due to the necessity of completing the manuscript that I could not include Vogt's environmental ethics in this book.

Finally, my thanks go to Charlotte Cremer for her extremely accurate proofreading of the German-language manuscript and numerous valuable suggestions, and to Dr Bernward Kröger of Aschendorff-Verlag for his usual reliable editing of the German edition of the book. I would also like to thank Beate Bernstein from Nomos-Verlag for accompanying the English translation presented here.

With the publication of this book, I hope that it will stimulate and enrich professional discussions beyond the German-speaking world, but above all that the spiritual resources from 2000 years of Christian tradition will give us strength and orientation to walk the path of ecological conversion together.

Linz, May 2022

Michael Rosenberger

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1. "Our House is on Fire." Introduction

1.1 *The impetus of Fridays for Future*

"Our house is on fire. I am here to say, our house is on fire." (Greta Thunberg 2019). With these words, Greta Thunberg began her speech to the World Economic Forum in Davos on 25.1.2019. At that point, she had already experienced a spectacular six months since she had sat down in front of the Swedish Parliament in Stockholm on 20.8.2018, the first school day after the Swedish summer holidays, with a sign "Skolstrejk för klimatet" ("School strike for climate"). It took about two and a half months for other students in Sweden and other countries to join her. As late as November 2018, they gave themselves the name "Fridays for Future" based on their Friday school strikes. A worldwide movement was born that had probably never been seen before in a comparable way.

Despite the full brakes of the coronavirus pandemic, with Fridays for Future the global environmental movement reached an unimagined peak. For over a year, countless young people around the globe engaged in the movement with dedication and competence, creativity and humour, passion and unwaveringness for a rapid reversal of policy towards global and effective climate justice. In doing so, they joined a movement that goes back to the beginnings of the 20th century. The philosopher Ludwig Klages (1872 Hannover–1956 Kilchberg, CH), for example, criticised the destruction of nature that accompanied industrialisation as early as a year before the First World War: "Railroad tracks, telegraph wires, power lines cut through forests and mountain profiles with raw straightness.... the same grey multi-storey tenements line up uniformly wherever the educated man unfolds his 'beneficial' activity; the river courses, which once glided in labyrinthine curves between lush slopes, are made into dead-straight canals; the rapids and waterfalls, even the Niagara, have electric collecting points to feed; forests of chimneys rise up on their banks, and the poisonous effluents of the factories burn away the louder waters of the earth; in short, the face of the mainland is generally transformed into a Chicago interspersed with agriculture." (Ludwig Klages 1913). In the same year, under the patronage of Crown Prince Rupprecht of Bavaria (1869–1955), the Bund Naturschutz was founded in Klages' then home

town of Munich, which is still the backbone of the German environmental and nature conservation movement.

Interrupted by the two world wars and the subsequent reconstruction, the problem of global environmental destruction has only become more perceptible and important since about 1970. Due to the scarcity of resources, especially oil, but also due to the awareness of social differences in the world, a first quantum leap in social consciousness took place. The nature, species and heritage protection movement of the early 20th century broadened its horizons, became an environmental movement in a more comprehensive sense and thus reached new milieus: in political debate, in the sciences—including theology and ethics—, in religions—including Christianity—and in many other social groups, ecology became an issue. Ultimately, this first quantum leap led to the founding of green parties and the introduction of environmental ministries in many democratic countries.

But even after the UN Conference on Environment and Development in Rio in 1992 and the subsequent political and social processes, ecology remained a minority topic until a few years ago. This was true for science, even where one deals most directly with ecological issues, namely in biology and physics. In theology, too, some disciplines have remained largely ecologically indifferent to this day. Parallel to the sciences, the role of environmental policy in the overall political arena is developing. Rio had called for the ecological question to become a cross-cutting issue in all politics. But until the mid-2010s, it remained more of a "nice to have" issue, ranking far behind the "must haves" such as foreign, financial, economic and social policy and having to live on what fell as crumbs from the table of the powerful.

It is only since the second half of the last decade that there have been signs of a new quantum leap. The climate conference in Paris in 2015, supported among others by Pope Francis' encyclical *Laudato si'* published shortly before, triggered a new jolt. Greta Thunberg therefore came at exactly the right moment. She was the spark for which there was already plenty of explosive material. In one fell swoop, the issue of climate justice became a top priority—but one that has yet to prove durable after the coronavirus pandemic.

1.2 The environmental crisis as a sign of the times

This book is titled "Christian Creation Ethics". This designation includes both a formal and a material specification. *Formally*, the term "creation" is a direct correlative to the belief in a single Creator God "who made heaven and earth" (Ps 121:2). A creation ethic is conceptually immanently monotheistic—Jewish, Christian or Islamic. As a Christian creation ethic, it is deeply connected to the creation ethics of the other two monotheistic religions, without negating their independence. In all modesty, but also in all transparency, one's own standpoint on faith is displayed and offered for discussion. This display of one's own standpoint on faith as an offer for discussion is not only addressed to the monotheistic sister religions, but also enables a connection to secular, especially philosophical environmental ethics: Like these, the ethics of creation also claims to be capable of dialogue and comprehensible for all religions and world views.

Materially, creation ethics combines the often separately discussed areas of environmental and animal ethics. "Environment" (German Umwelt, literally surrounding world) is usually defined in contrast to "co-world" (German Mitwelt). While co-world means the other human and non-human living beings, environment refers to the house of life, the "oikos", which is in the term ecology. Environmental ethics or ecological ethics is therefore ethics that primarily asks how to deal responsibly with the house and only secondarily with the inhabitants of the house. By contrast, co-world ethics or animal and plant ethics is ethics that primarily asks about the responsible treatment of the inhabitants of the house and only secondarily about the treatment of the house. Creation ethics encompasses both and considers human behaviour towards both the living house and living beings. This also signals that environmental and co-world ethics can be distinguished between, but not separated—as often as this happens in scientific reflection.

For long stretches, this book deals with questions of justification that are equally relevant for environmental and co-world ethics. The last chapters, which search for sustainable motivations and attitudes, also have the same weighting in terms of environmental and co-world ethics. However, I spell out the concreteness of responsibility for creation only for the two greatest environmental problems, namely global warming and biodiversity loss. I do this in the conviction that they exemplify what is at stake overall: a fundamentally new relationship between humankind and creation.

Theologically speaking, the environmental crisis is a "sign of the times": a phenomenon that characterises an era and leaves a particular mark on

1. "Our House is on Fire." Introduction

it. It touches on essential questions of human existence. Because such a phenomenon has a crisis character, it demands decisions (κρίνειν, to divorce, to separate). It changes people's consciousness (Markus Vogt 2018, 248–249). "Signs of the times" are thus something like "identity markers"—characteristics by which the late 20th and early 21st centuries will be recognised for generations to come. The environmental crisis will inevitably be one of these identity markers. The present time will one day be remembered as the "time of the great environmental crisis"—perhaps negatively, in that it was here that the catastrophe began, but hopefully positively, in that it was here that the endeavours to overcome it were begun.

Even the first European Ecumenical Assembly in Basel in 1989 understood the global threats to justice, peace and the integrity of creation as signs of the times to which it sought a response (EEA 5). According to the Pastoral Constitution of the Second Vatican Council, it is one of the central tasks of the Church "to search for the signs of the times and to interpret them in the light of the Gospel. In this way, she can then answer, in a manner appropriate to each generation, the lasting questions of people about the meaning of present and future life and about the relationship of the two to one another. It is therefore necessary to grasp and understand the world in which we live, its expectations, aspirations and its often dramatic character." (GS 4)

Consequently, the church and theology must not play down this "dramatic character" of our epoch but must take it seriously and deal with it appropriately. In view of its eternity orientation, religion is tempted to diminish the dramatic nature of earthly life and to point to the "real challenges" that are located with reference to the hereafter. All the more clearly, the Council admonishes that the mission of the Church and theology is in this world and must take seriously the earthly needs of human beings and creation. This is precisely what this book aims to do.

1.3 Bound in the bag of life

"Our house is on fire. I am here to say, our house is on fire." (Greta Thunberg 2019). A *creation ethic* that trivialises or relativises this sentence is not worth writing. But, as we will see in chapter 7, that would not be in keeping with Jesus of Nazareth either, whose apocalyptic legacy informs his central message, "Repent!" to the pores. The first thing *Christian* creation ethics can contribute, compared to its secular cousins, is to clearly grasp

and reflect on the narrative of this drama, which the secular environmental movement largely owes to the monotheistic religions of the West anyway. This book, then, aims to illuminate, analyse and raise awareness of the ecological narrative—and thus to raise its potential, which often still lies dormant.

A second contribution can be made by decidedly theological creation ethics: serenity and trust that do not make us inert, but empower and liberate us to act ecologically, which relieve the pressure and the constraint without diminishing the drama. They do not pretend to be cheap comforts but speak plainly and yet allow hope (chapter 10). For they know that this earth is mysteriously sustained precisely as a threatened and battered one.

This inscription is often found on Jewish gravestones:

צְרוּרָה בַּצְרוּר הַחַיִּים
ṣərûrâ biṣrôr haḥayyim

In English, this means "bound in the bag of life". This phrase is found in 1 Sam 25:29¹. There Abigail apologises for her husband Nabal, who refused hospitality to the later King David, and reinforces her apology with a blessing: "But if any man arise to persecute thee, and to seek thy life, let the life of my lord [i.e. David's, note MR] be bound up with the LORD thy God in the bag of life: but the life of thine enemies may the LORD fling away with a sling."

Instead of David, one could also refer this blessing to the earth or to every single creature. For a blessing can hardly be formulated more beautifully—and at the same time it makes the constant threat abundantly clear, which does not simply disappear. Blessing means the wish not to be lost as fragile, endangered and, ultimately in any case, mortal living beings, but to be carried—"bound in the bag of life".

But what does the "bag of life" mean? Even in the ancient Orient, cattle breeders and shepherds kept careful records of their livestock. Kings and princes who had scribes at their side did this in writing. But the people who did not know how to read and write used a simple symbol. When the owner of the flock sent the shepherds commissioned by him on a journey with his flock, as many small stones as there were animals in the flock were put into a bag. Then the bag was closed twice, by the owner

1 I first became aware of this sentence through my Old Testament colleague Maria Häußl, with whom I offered an interdisciplinary seminar under this heading at the University of Würzburg in the winter semester 1997/98. It is still one of my most beautiful teaching experiences.

1. "Our House is on Fire." Introduction

of the herd and by the shepherds, so that no one could open the bag without it being recognisable. When the shepherds returned, the animals were counted, and their number, subtracting the new-born lambs, was compared with the number of stones in the bag. In this way, both sides could be sure that the shepherds had fulfilled their task faithfully. The bag was called the "bag of life". Every single sheep was bound into it. None was to be lost.

Man as the "image of God" (Gen. 1:26) is just such a shepherd to whom God's flock is entrusted in faithful hands. He is not the owner of the animals, but "only" their keeper. And he is to remember that when he returns, he must account for each of the animals. For each, even the smallest, supposedly most useless creature of this earth is "bound up in the bag of life".

1.4 *The structure of the book*

This positioning of human responsibility (ethical formal object) for the house of life on earth and its inhabitants (material object) between the unprecedented threat and the unshakeable belief in being supported in this threat (theological formal object) results in the structure of this treatise. Put simply, it follows the classic three-step process of seeing (chapter 2)–judging (chapters 3–7)–acting (chapters 8–10).

Chapter 2 identifies, analyses and surveys the greatest ecological challenges currently facing us, questions their causes and illuminates their drama and urgency. The concept of limits plays a key role in this, both scientifically and ethically.

Chapters 3 and 4 search in two of the most important sources of theological knowledge (so-called "loci theologici") for standards for an appropriate perception of the environmental crisis and ecological perspectives for action from the perspective of Christian theology. First, chapter 3 examines the Bible as the original knowledge of the Christian faith and then chapter 4 the liturgy with its symbols and rituals as its visible realisation. A remarkable difference will be revealed between the two sources, many aspects of whose theological treatment are still outstanding.

Chapter 5 then locates the previously raised Christian creation ethics in the discourses and approaches of philosophical environmental ethics and elaborates the specific contribution of theology and religion. It is precisely the greater emotionality of faith that gains significance here and has consequences for the rational justification of creation ethics.

Chapter 6 deals with the central bridging discourse that connects politics, society and the economy, the natural sciences and humanities, and religious and secular convictions in the struggle for ecological stability: the concept of sustainability or sustainable development. Against the background of its historical origins and its systematic ethical classification, its opportunities, but also its limits, become clear.

In the German-speaking world, the sustainability discourse has given rise to the secular concept of a "great transformation", a sociological and political concept that will be linked to the classical Christian message of conversion in chapter 7. It will have to be asked whether and what added value the theological concept of ecological conversion contributes to the sociological concept of transformation.

Ecological conversion requires structural changes, especially in the dominant social subsystem of the market economy. These are dealt with in chapter 8. Ecological conversion, however, also requires personal reorientation towards the good life and corresponding attitudes. These are examined in chapter 9. Structural and individual reforms must complement and strengthen each other if humanity is to live up to its responsibility.

Finally, it must be asked how environmental activists can escape burnout in their tireless commitment and how society as a whole can escape paralysing environmental anxiety. Here, the question of hope, which has always been considered the domain of religions, will have to be asked anew. Chapter 10 will show, however, that especially in the monotheistic religions, a number of corrections are necessary in order to arrive at a sustainable concept of hope that does not trivialise the drama.

2. Looking into the abyss. The analytical tool of planetary boundaries

2.1 *The concept of planetary boundaries*

How much strain can we put on the earth's ecosystem without risking its permanent collapse in essential parts? This is the question that an international research group from top-level institutes has been asking since 2009 (Johan Rockström et al. 2009a and 2009b). Their goal was and is to define a "safe operating space" for the further development of human societies. Whereas previous environmental research had named local or regional stress limits, the research collective is venturing towards the planetary level. This is extremely ambitious and demanding, and certainly the results have some uncertainties. But tackling this task is a must because the earth as a whole is indeed at risk.

In a first step, the research group therefore looked for a concept of "planetary boundaries" that is as simple and precise as possible. For the authors, a planetary boundary is not a tipping point at which the earth's ecosystem would abruptly collapse, and consequently it is not an absolute limit, the crossing of which would clearly and immediately trigger a catastrophe. Rather, the planetary boundaries are set well below the tipping points so that global society still has enough time to react and adopt countermeasures before it is really too late. For this reason, the authors have determined a "zone of uncertainty" for each boundary, at the uncertain end of which there is a considerable probability that the earth's ecosystem will tip over. The further the transgression of the zone of uncertainty progresses, the more likely the overturning becomes. The uncertain end is thus determined by the considerable probability of the objective overturning of the previous physical, chemical and ecosystem processes and is therefore primarily determined by natural science. The safe end of the "zone of uncertainty", on the other hand, is essentially defined by people's general (inter-) subjective need for security and traditional standards of democratic societies in dealing with risks. It is therefore determined more by the human sciences than by the natural sciences.

In total, three areas will be surveyed:

- The area in which the processes are definitely out of control and the tilting of the earth's ecosystem has considerable probability (beyond zone of uncertainty).
- The area in which human action is highly risky because the processes become out of control (zone of uncertainty, cf. Johan Rockström et al. 2009a, Fig. 2).
- The area in which human activity is relatively safe (safe operating space).

The aim of the analysis is primarily to identify this third area and to motivate all those responsible to take measures to return to this relatively safe area or not to leave it in the first place.

2.2 *The nine borders and their meaning*

In the second step, the research group looked for a manageable, but as representative as possible set of planetary boundaries. First, those processes that significantly control the ecosphere had to be identified and then aggregated in a simplified way to a single measurable boundary. The result is nine planetary boundaries, which I will briefly describe below. The order of these boundaries is arbitrary. There is no hierarchy between them; they are all equally original and equally significant, and neither are they derivable from each other despite their many interactions. The order of presentation chosen by the research group has changed in the course of their work. I follow the more recent chart shown below (Will Steffen et al. 2015, 736) and the clockwise order there, starting at 1 o'clock.

- *Chemical pollution and the introduction of novel substances and organisms*: Humans emit a large number of toxic substances that are very persistent. These include, for example, synthetic organic pollutants, heavy metal compounds and radioactive substances. These can have irreversible effects on both living organisms (e.g. reduced fertility or genetic damage) and the physical environment (e.g. atmospheric processes and climate). These effects can be severe and occur far from the source of the pollution. Damage from different substances can also add up and act synergistically.
- *Ozone depletion in the stratosphere*: The ozone layer in the stratosphere filters out ultraviolet radiation from the sun. If this layer decreases, more and more UV rays reach the earth's surface. This can lead to permanent damage to biological systems and more frequent occurrence

of skin cancer in humans. With the Montreal Protocol, which was adopted in 1987, has been ratified by all member states of the United Nations since 2009 and prohibits the production and emission of so-called "ozone killers", humanity seems to have found an effective instrument against ozone depletion.

- *Charging the atmosphere with aerosols*: An aerosol is a mixture of suspended solid or liquid particles in a gas. The particles float because their weight in relation to their surface area is so low that air resistance cannot be overcome by gravity. Aerosols in the atmosphere influence the earth's climate because they reflect and absorb sunlight, and the global circulation of water in the air. If inhaled by living beings, they can seriously affect their health. Humankind increases the number of aerosols in the atmosphere directly by emitting exhaust gases and indirectly through land use changes that increase the natural release of dust and smoke into the air.
- *Ocean acidification*: About a quarter of the carbon dioxide emitted by humans into the atmosphere dissolves in the oceans in the long term. There, it forms carbonic acid and lowers the pH value of the surface water. The increased acidity reduces the amount of carbonate ions available. Carbonate, however, is an essential building block for the shell and skeleton formation of many species living in the ocean. Its decline reduces the ability of organisms such as corals, shellfish and plankton to grow and survive. The loss of these species could, in turn, lead to a drastic reduction in fish stocks.
- *Biogeochemical material fluxes, especially of nitrogen and phosphorus*: Biogeochemistry is essentially concerned with material fluxes between the individual ecosystems of the earth. Besides water and carbon, which are already considered in some of the nine planetary boundaries, nitrogen and phosphorus in particular play a major role. Their biogeochemical cycles are radically altered by humans through industrial and agricultural processes. As they are essential conditions for plant growth, fertiliser production and use are the main problem. Human activity currently converts more atmospheric nitrogen into reactive forms than all of earth's natural processes combined. Much of this nitrogen is not absorbed by plants but emitted into the atmosphere. Similarly, only a small proportion of phosphorus fertiliser is absorbed by food crops. A large proportion ends up in water systems where algae and other plants grow excessively. From there, nitrogen and phosphorus eventually enter the sea and can cause marine ecosystems to topple.

- *Freshwater consumption and the global water cycle*: For almost all living creatures, water is the most precious resource (next to light). On the one hand, the freshwater cycle is strongly affected by climate warming and land use changes. But the dominant driver of serious changes is human water consumption. Water is becoming increasingly scarce. By 2050, about half a billion people are expected to suffer from water scarcity.
- *Land use change*: All over the world, land areas are being converted for human use. (Rain) forests, meadows and wetlands are primarily being turned into agricultural land. These land use changes are a driving force in the reduction of biodiversity and have an impact on the cycles of water, carbon, nitrogen and phosphorus as well as on the concentration of aerosols in the atmosphere.
- *Integrity of the biosphere (at the level of diversity of species and ecosystem diversity)*: Humanity's enormous demand for food, water and natural resources has led to a severe loss of species diversity as well as ecosystems and their services. The sciences speak of the sixth great mass extinction of species in the history of the earth.
- *Global warming*: Since the beginning of industrialisation, mankind has, on the one hand, emitted gases that intensify the natural greenhouse effect of the earth's atmosphere and, on the other hand, destroyed so-called "carbon sinks" such as rainforests or peatlands that bind carbon from the atmosphere. This has led to a noticeable warming of the earth's atmosphere, which will continue at an ever faster rate if humanity does not implement decisive countermeasures.

2.3 Measured variables and measurement of the limits

The research group has thus compressed the greatest threats to planet earth into these nine boundaries. Now two tasks remain: On the one hand, it is necessary to find a meaningful parameter for each boundary that can be used to determine whether it has been exceeded or not. And on the other hand, two threshold values must be specified for each of these variables in order to delimit the "zone of uncertainty" upwards and downwards. By comparing them with the actual values measured, it can then be said in which of the three areas humanity is currently located: in the safe space of action, in the zone of uncertainty or beyond the zone of uncertainty.

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If the variables measured are defined as described and compared with the actual values, the following picture emerges:

- For one limit, no variables or global limit values can be given at present, namely the aerosol charging of the atmosphere (for which, however, regional variables and values are available).
- Three limits are currently still being undershot, i.e. we are still in the safe operating zone, at least from a global perspective: ozone depletion in the stratosphere, ocean acidification and freshwater consumption. However, in all three cases, there are clear regional transgressions and associated problems. Over Australia, for example, the ozone layer is very thin; on some coasts such as the Great Barrier Reef the acidification of the seawater clearly exceeds the acceptable level, which is why the coral reefs there are dying; and, of course, there are regions of the world where the anthropogenic freshwater shortage is dramatic. Moreover, the dynamics are favourable only for ozone depletion: as already mentioned, the 1987 Montreal Protocol ensures that the "ozone killers" are no longer produced and that the stratospheric ozone layer can therefore recover slowly but steadily. For the other two boundaries, however, where the earth is currently in the green zone, the dynamics are leaning towards deterioration. The zone of uncertainty could soon be reached.
- Two boundaries are already being crossed into the realm of uncertainty, namely land use change and global warming. However, if we look at their dynamics, the destruction of forest areas is currently accelerating rather than being slowed down—especially in the rainforest zone. Greenhouse gas emissions are also not decreasing but continuing to grow.
- Finally, three boundaries have already been crossed far beyond the range of uncertainty: the material flows of phosphorus and nitrogen, the introduction of novel substances and organisms, and the integrity of the biosphere.

Summarised in a table and a chart, it all looks like this:

Table: Measured variables and measured values (target/actual) of the planetary boundaries (according to Will Steffen et al. 2015, 734–735)²

Dimension		Measured variable	Zone of Uncertainty (from-to)	Measured value 2015
1 Introduction of novel substances		Several complementary metrics, trend observation		
2 Ozone depletion in the stratosphere		Ozone concentration in the stratosphere (Dobson Units = DU)	275–260 DU	450–220 DU
3 Aerosol charging of the atmosphere		Aerosol optical thickness (without unit)	No global limit defined	?
4 Ocean acidification		Mean global aragonite saturation in surface water (omega units)	2,75–2,40 Ω	3.03 Ω
5 Biogeochemical material flows	Phosphorus cycle	Phosphorus input into oceans (teragram/ year = Tg/ a)	11–100 Tg/ a	22 Tg/ a
		Phosphorus input into freshwater systems (Tg/ a)	6.2–11.2 Tg/ a	14 Tg/ a
	Nitrogen cycle	Industrial and intentional biological fixation of nitrogen (Tg/ a)	62–82 Tg/ a	150 Tg/ a
6 Freshwater consumption and the global water cycle		Global consumption of surface and groundwater (cubic kilometres/year)	4000–6000 km ³ / a	2600 km ³ / a
7 Land use change		Still preserved part of the original forest area	75–54 %	62 %
8 Integrity of the biosphere	Genetic diversity	Extinction rate (number of species extinct per million species per year = E/ MSY)	10–100 E/ MSY (long-term 1 E/ MSY)	100–1000 E/ MSY
	Functional diversity	Biodiversity Intactness Index	90–30 %	84% for Southern Africa

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Dimension	Measured variable	Zone of Uncertainty (from-to)	Measured value 2015
9 Global warming	CO ₂ concentration in the atmosphere (ppm) <i>or</i>	350–450 ppm	398 ppm
	Radiative forcing (W/m ²)	1.0–1.5 W/m ²	2.3 W/m ²

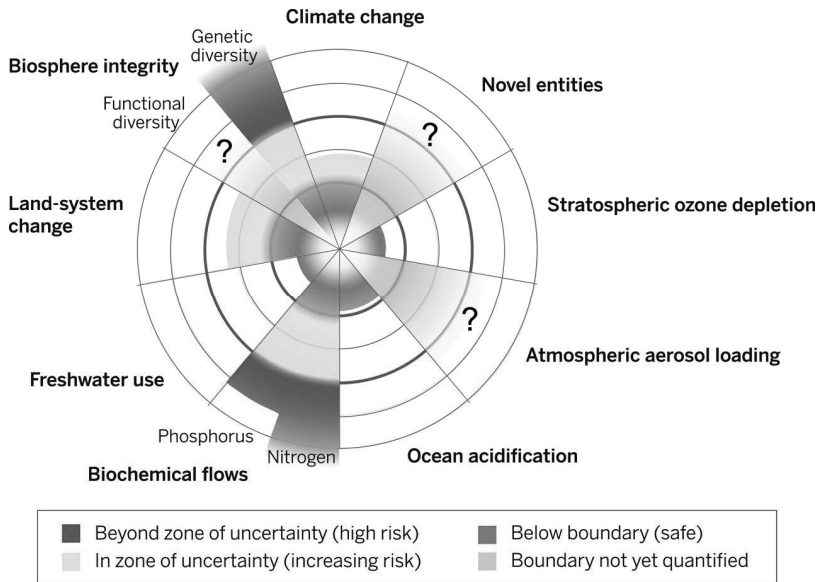


Chart: Status of Planetary Boundary control variables in 2021 (from: Will Steffen et al. 2015, 736; the update of the boundary crossing for novel substances based on Linn Persson et al. 2022 has not yet been incorporated).

In relation to the necessary question of the causes of this, one central aspect must be kept in mind from the outset: The activities of agriculture and food processing are single-handedly responsible for exceeding three

2 The current figures for the last column of row 9 Global Warming can be found here: Earth System Research Laboratories, Trends in Atmospheric Carbon Dioxide, in: <https://www.esrl.noaa.gov/gmd/ccgg/trends/> and Annual Greenhouse Gas Index, in: <https://www.esrl.noaa.gov/gmd/aggi/aggi.html> (retrieved 10.10.20). For the other eight indicators, there are no continuous updates yet. The assessment for the introduction of novel substances draws on Linn Person et al. 2022.

of the five boundaries transgressed: biogeochemical fluxes (phosphorus, nitrogen), land use change and biosphere integrity; they still contribute 37% to the fourth transgression, global warming (Toni Meier 2017, 69). The great challenges facing the planet cannot therefore be solved without a radical change in agriculture. At the same time, it is possible in principle to feed a world population of 9 or 10 billion people without damaging the planet (Dieter Gerten et al. 2019). The frequently voiced claim that consistent greening of agriculture would leave countless people starving is simply wrong. Rather, whether or not the path to environmentally friendly development can be followed will depend on a fundamental reform of global agriculture.

2.4 Key problem 1: Global warming

Among the nine planetary boundaries, two stand out, according to the research group, because, on the one hand, they have the largest impact on the planet and, on the other hand, they are the most interconnected with the other planetary boundaries as well as with each other: global warming and biosphere integrity. These two will therefore be presented in more detail below.

In contrast to weather, *climate* refers to long-term average (mean) constellations of temperature, precipitation and other weather phenomena. While the current weather has an effect for a few days or weeks at most, climate determines periods of years or decades. Which plants and animals thrive in a region, how high a river overflows its banks, how much water it carries all year round—these are all questions that depend on the climate. Climate is therefore of central importance for the living conditions of living creatures, including humans.

Now the earth's climate is fluctuating constantly. This is caused by changes in the earth's orbit around the sun, rising or falling solar activity, and large volcanic eruptions whose ash remains in the earth's atmosphere for long periods of time. Climate changes are therefore completely natural and unavoidable. Living things have to adapt accordingly—often by migrating from one climate zone to another—or become extinct. This also applies to humans. Humankind has inhabited the earth for about 3 million years and has experienced some climate fluctuations during this time. As long as they lived nomadically, they could cope with it relatively well—continuous migration was part of their lifestyle. After settling down in the Neolithic period about 11,000 years ago and the associated

development of agriculture, however, humankind became very vulnerable to climate-induced migratory pressures.

During this phase of the last 11,000 years, however, the earth's climate was more stable than on average. Compared to the world mean temperature of 15 degrees Celsius, it fluctuated by a maximum of one degree up or down. This was quite different in previous warm periods: during the Eemian warm period (about 126,000 to about 115,000 years ago) the climate fluctuated by 2 to 2.5 degrees Celsius, and during the Pliocene warm period (about 5.3 to about 2.6 million years ago) even by 3 to 3.5 degrees Celsius. But even the fluctuations of the last 11,000 years have had enormous social consequences. Thus, the rise of the Roman Empire would not have been conceivable without the "Roman Climate Optimum", and its downfall would not have occurred without the "Migration Cold Period" (Kyle Harper 2020). The entire history of the world has had to be rewritten in recent decades against the background of climate science. Since sedentarisation, the well-being of human societies has depended more than ever on climate.

There is also a so-called "*natural greenhouse effect*". As early as 1824, Joseph Fourier (1768 near Auxerre–1830 Paris) postulated it in an essay in which he calculated that the temperature on earth would be much lower without such an effect. And indeed: if the earth were not surrounded by a thin layer of various gases, the mean world temperature would be minus 18 instead of plus 15 degrees Celsius. The gases in the earth's atmosphere act like a glasshouse and cause significant warming. This is because they allow energy-rich, short-wave solar rays to shine onto the earth's surface. There, part of their energy is absorbed, so that longer-wave, less energetic rays are reflected upwards. Because of their low energy and long wavelength, the greenhouse gases reflect some of them so that they hit the earth's surface again, and some of them are released back into space. In this way, the earth heats up more than if it did not have a gas envelope.

However, if the degree of global warming depends on the type and quantity of greenhouse gases, the earth's mean temperature will inevitably change as soon as human activity causes the greenhouse gases to change. It was precisely this man-made, "*anthropogenic greenhouse effect*" that the later Nobel Prize winner for chemistry Svante August Arrhenius (1859 Vik–1927 Stockholm) predicted for the greenhouse gas carbon dioxide in 1896. In view of this early prediction, it is surprising that the first United Nations "World Climate Conference" (WCC-1) did not take place until

1979 in Geneva. Apparently, time had to mature for global initiatives to take effect.

What are the main *causes of the anthropogenic greenhouse effect*? First of all, this is the direct emission of greenhouse gases

- Carbon dioxide (CO₂, approx. 60% of the anthropogenic greenhouse effect),
- Methane (CH₄, approx. 20% of the anthropogenic greenhouse effect),
- Nitrous oxide (N₂O, approx. 7–8% of the anthropogenic greenhouse effect),
- Hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) (together accounting for about 10% of the anthropogenic greenhouse effect),
- Sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃) (minor contribution to the anthropogenic greenhouse effect).

In addition to the direct emissions of greenhouse gases, there is the indirect effect from the removal of so-called natural "greenhouse gas sinks", which bind certain greenhouse gases and reduce their concentration in the atmosphere. A hundred-year-old spruce, for example, binds the carbon from about 2.6 tonnes of carbon dioxide, a hundred-year-old beech from even about 3.5 tonnes. A wooden house built from hundreds of tree trunks accordingly binds the carbon from hundreds of tonnes of carbon dioxide. If large sinks such as the tropical rainforest or large peatlands are now destroyed, this massively reduces the capacity of the global ecosystem to extract carbon dioxide from the earth's atmosphere and convert it into carbon and oxygen.

The emission of greenhouse gases and the removal of their sinks make up the anthropogenic greenhouse effect. In 2001, the Intergovernmental Panel on Climate Change (IPCC), composed of about 3000 climate researchers and commissioned by the state governments of all countries, states in its Third Assessment Report that, even taking into account remaining uncertainties, most of the global warming since 1950 can almost certainly be attributed to such human activities (IPCC 2001, 398–399). The Fourth Assessment Report 2007 then considers the influence of humans on the climate system as clearly proven (IPCC 2007, 104–106). Since that time at the latest, claims to the contrary have no longer been able to invoke scientific consensus.

But what are the *consequences of anthropogenic global warming*? Compared to pre-industrial levels, the world mean temperature has already risen by about one degree Celsius and the sea level by about 25 centimetres. If humanity continues to behave as it has in recent decades ("business as usual"), the world mean temperature could rise by 7 degrees Celsius (IPCC

2014, Fifth Assessment Report). This is more than the 6 degrees that the IPCC predicted in 2000 and twice what it predicted in 1995. The forecasts are thus becoming more and more dramatic, which on the one hand has to do with the ever-increasing greenhouse gas emissions by humans, and on the other hand with the feedback effects of individual climatic processes that are becoming more and more apparent. The IPCC predicts that sea levels will rise by a further 80 centimetres by 2100, assuming business as usual. Moreover, sea levels will continue to rise for a long time even if the world mean temperature does not increase any more.

Year by year, the IPCC's calculations become more precise and accurate. The so-called "climate sensitivity", i.e. the sensitivity of the climate to greenhouse gases, was still estimated relatively inaccurately in the IPCC's Fifth Assessment Report of 2014. Global warming was calculated to be between 1.5 and 4.5 degrees Celsius if the concentration of greenhouse gases in the atmosphere doubled. That still left a lot of room for speculation. A new calculation narrows this estimation corridor considerably. With a doubling of the greenhouse gas concentration in the atmosphere, one now assumes 2.5 to 4.0 degrees of global warming (Steven Sherwood et al. 2020). The broad direction of the earlier estimate is thus confirmed, but has been considerably refined and made more precise.

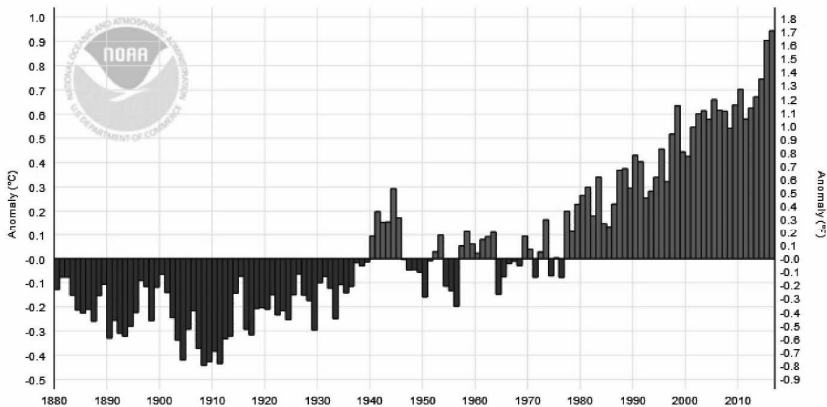


Chart: Deviations of global annual mean temperatures from 1881 to 2016 compared to the 20th century mean (Source: National Oceanic and Atmospheric Administration NOAA 2017)

We must therefore expect a dramatic increase in the earth's mean temperature. However, even if it is possible to limit it to 1.5 degrees Celsius above

pre-industrial levels, as agreed at the 2015 World Climate Conference in Paris, the local and regional consequences will be significant, "including an increase in extreme temperatures in many regions (high confidence), increases in the frequency, intensity and/or amount of heavy precipitation in some regions (high confidence), and an increase in the intensity or frequency of droughts in some regions (medium confidence)." (IPCC 2018, 11). "Sea levels will continue to rise well beyond 2100 (high confidence)." (IPCC 2018, 11) "Out of 105 000 species studied ... 6% of insects, 8% of plants and 4% of vertebrates ... will lose more than half of their climatologically determined geographic range" (IPCC 2018, 12).

We have been able to observe some of these changes in Central Europe for years. Storm disasters are on the increase, years of extreme drought have put a strain on agriculture and forestry. The glaciers in the Alpine region, which according to the World Glacier Monitoring Service in Zurich lost a quarter to a third of their area between 1975 and 2000 alone, are continuing to recede dramatically and will, for the most part, disappear completely, which will lead to a summer water shortage in the rivers of the Alpine region and cause temperatures in the Alpine valleys to rise far above average because they lack the cooling provided by the glaciers.

As already mentioned, climatic changes have always had major *impacts on human societies*. This is also the case in the most favourable conceivable case of a temperature increase of only 1.5 degrees Celsius by 2100: "Climate-related risks to health, livelihoods, food security and water supply, human security and economic growth will ... increase" (IPCC 2018, 13). Thus, in 2015, the renowned medical journal "The Lancet" appointed a commission that annually assesses the health consequences of global warming under the name "The Lancet Countdown". Their forecasts are already dramatic, on the one hand with regard to the direct consequences of greater heat on the heart, circulation, kidneys and brain, and on the other hand with regard to indirect consequences through the greater increase in and spread of infectious germs (Nick Watts et al. 2019). Almost all medical disciplines are thinking intensively about how to prepare for the consequences of global warming. The economic side is similar: Munich Re, which acts as a reinsurer, measured four times more natural disasters and 15 times greater damage caused by them for the decade from 1985 to 1995 than in the decade from 1960 to 1970. Rich industrialised countries have meanwhile implemented adaptation measures such as dikes or flood protection walls. Poorer countries, however, cannot afford this.

If sea levels rise by one metre, about 18 per cent of Bangladesh's land area will be under water, and 38 million people will lose their homes and

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become climate refugees. In the Nile Delta, 8 million people will become homeless, and 12.5 per cent of Egypt's agricultural land will be destroyed. The Maldives will sink completely, as will the island nation of Tuvalu, the fourth smallest member state of the United Nations, whose 11,000 inhabitants already left the country in 2002 and emigrated to New Zealand. Millions and millions of environmental refugees will take flight (IPCC 2007), so much so that the US Department of Defence already warned in 2004 that environmental policy is the best defence policy. We cannot imagine the impact of global warming on our human lives dramatically enough.

2.5 *Key problem 2: The loss of biodiversity*

Although the second key issue of biodiversity enjoys far less attention than climate protection, it is even more serious and pressing. The term was first used by Thomas E. Lovejoy (1980, 327) in the Global 2000 Report to US President Jimmy Carter. While Lovejoy understood biodiversity there to mean only species diversity, the term was later defined more broadly. Today, the definition of the Biodiversity Convention is mostly adopted: "Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems." (United Nations 1992, Art. 2) Accordingly, biodiversity is understood as the diversity of life forms in all their forms (genes, species, ecosystems and landscapes, which are often added as a fourth) and their relationships to each other. Each level of diversity is analysed under the three aspects of its composition, structure and function.

In itself, evolutionary history is a process towards increasing diversity of both genes and species and ecosystems. Nevertheless, in the course of earth's history, there have also been phases of drastic destruction of diversity, so-called "mass extinctions". The cause was usually dramatic climate change, and in the case of the fifth and, so far, last mass extinction, the impact of a huge meteorite.

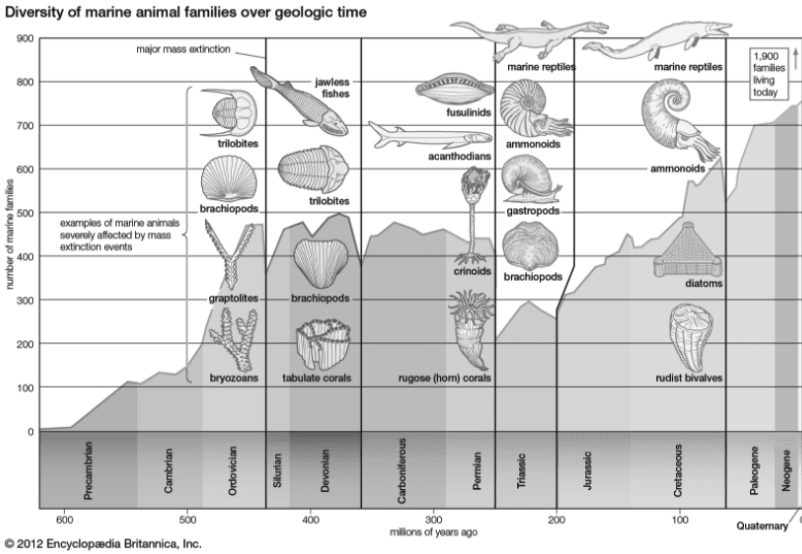


Chart: Number of families of marine fossils over the course of earth's history. They are a good indicator of the overall species diversity on earth. (from: Encyclopædia Britannica, <https://www.britannica.com/science/mass-extinction-event#/media/1/368208/74659> (12.5.2022)).

In addition to the temporary mass extinctions, there is a barely noticeable but very *natural extinction of species* that is constantly taking place. 99% of all species in the history of the earth are now extinct. And yet there are currently so many species that humans know only a small proportion of them. About 60% of them belong to insects, 11% to fungi, 2–3% to green plants and only 0.4% to vertebrates, including 0.0003% to mammals.

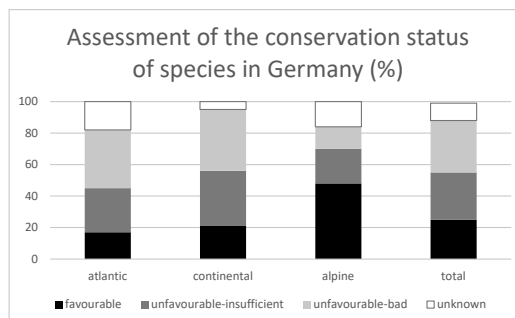
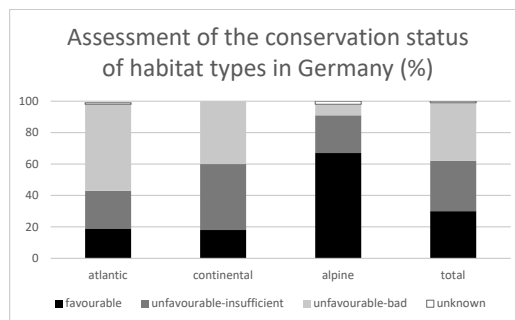
However, the industrialisation of modernity has ushered in a dramatically opposite development. Globally, one of the most extensive species extinctions in earth's history is underway, the "sixth extinction", as Elizabeth Kolbert titled it in 2016. For example, the German Federal Agency for Nature Conservation rates the conservation status of 37% of all habitat types in Germany as poor and that of 32% as insufficient in 2020. The conservation status of all species living in Germany is only slightly better—here 32% are in a poor condition and 30% in an inadequate condition. A large part of our biodiversity is threatened with extinction.

According to the current report by the European Environment Agency (EEA), 79% of the habitats assessed in Austria are not in a good ecological condition—Austria thus ranks 18th out of 28 EU states, while Germany still manages to rank 10th due to more favourable conditions in the south

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of the country (EEA 2020, 44). The situation is even worse for species: Around 70% of the species assessed in Germany and as many as 83% of those in Austria have a poor to bad status, putting Germany in 21st place and Austria in 27th place out of 28 EU states (EEA 2020, 50).

The extinction of the smallest species, especially insects, is particularly significant. 40% of all insect species worldwide are threatened with extinction in the coming decades, with annual declines of 1 to 2% of species and 2.5% of biomass (Francisco Sánchez-Bayo/a/ Kris A.G. Wyckhuys 2019, 8 and 15–17). Insect mass in Germany has declined by two-thirds to three-quarters since 1990, and everything points to comparable values for Austria (Caspar A. Hallmann et al. 2017, 1; Fritz Gusenleitner/ Martin Schwarz 2019, 33). This means that birds, reptiles and small mammals lack food. And if these decline, the larger predators also lose their food source. The creatures of the biosphere are so strongly dependent on each other that they will be threatened one after the other like a row of dominoes.



Charts: Assessment of habitat types and species in Germany 2020 (from: Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit/ Bundesamt für Naturschutz (hg) 2020, 5–6)

What are the *causes* of this dramatic development (cf. Francisco Sánchez-Bayo/ Kris A.G. Wyckhuys 2019, 20; Martha J. Groom et al. (eds.) 2006³, 64–68)? The lion's share is contributed by industrialised intensive agriculture (see LS 34). In arable farming, it uses sprays on a large scale, killing not only "pests" but also many "beneficial insects"—causing huge collateral damage. Pastures are intensively fertilised, which drastically reduces the diversity of plants to those that absorb many nutrients, and consequently offers insects less food diversity. The intensively fertilised pastures are also mown more often, so that the plants often no longer flower and are consequently not available as a food source for insects. Marginal woody plants in fields and meadows are removed, so that many creatures lose their habitat. Finally, agriculture is responsible for numerous land use changes that also limit biodiversity: the draining of wetlands, swamps and bogs in Europe (LS 39) as well as the clearing of rainforests in Latin America and Asia (LS 32; 38).

But there are also other causes of the loss of biodiversity: natural areas are being increasingly cut through by traffic routes, so that they become too small a habitat for many animals (LS 32; 34–35). Rivers are straightened, dammed and diked, so that many creatures no longer find a home there. The environmental media soil, air and water are polluted with harmful substances (LS 34) and thus impair the health and reproductive capacity of plants and animals. Certain species are overexploited through hunting, fishing or wild plant exploitation (LS 40). Global warming is changing the living conditions of many ecosystems to such an extent that not all plant and animal species living there can survive (LS 24; 41). And the spread of so-called invasive species and pathogens through human mobility can put ancestral species under severe pressure.

The *consequences for nature and humans* are dramatic. From an ecological point of view, highly developed creatures, including humans, are largely dependent on habitats with high diversity. In layman's terms, we became aware of this when the bee mortality of recent years made us realise how dependent agriculture is on bees and other insects. Economically, biodiversity is invaluable. The destruction of ecosystems and biodiversity costs humanity two trillion US dollars a year—more than the financial crisis of 2008/09—and that is annually, not just once (TEEB 2010, 29). However, this is only the economically noticeable value of the so-called "ecosystem services", also referred to as "natural capital". This does not even include the positive health, aesthetic, psychological and spiritual effects of diverse nature on humans and its indirect effects on the tourism industry, for example (TEEB 2010, 46).

As with limiting global warming, there has been little progress in biodiversity conservation for thirty years. On the contrary, in some areas there has been regression. The tenth Conference of the Parties (COP-10) to the United Nations Convention on Biological Diversity, which took place in Nagoya in Aichi Prefecture in Japan in 2010, had defined twenty strategic goals for 2020, the so-called "Aichi Biodiversity Targets". In 2020, an evaluation of the targets took place—with alarming results (Secretariat of the Convention on Biological Diversity 2020, 12–17):

- half a target was overachieved,
- 1.6 targets were met,
- some progress was made on 11.82 targets, but the targets were clearly not reached,
- no progress was made on 3.53 targets and therefore the targets were not achieved,
- for 1.83 targets, the situation has even worsened, so one has gone in the opposite direction, and
- for 0.7 targets, their achievement could not be determined.

The drama becomes even clearer when one looks at the content of the targets set: Even such simple targets as target 1, to make the population of one's own country aware of the value of biodiversity, have only been achieved by slightly more than a third of the world's population. No progress at all was made on target 3.1, the complete dismantling of subsidies and support for actions that destroy biodiversity. This, too, should actually be an easily achievable goal. Target 5.3, to slow down the fragmentation and degradation of valuable ecosystems, has not only not been achieved, but on the contrary, fragmentation and degradation have accelerated. Similarly, target 8.2, to reduce fertiliser application in agriculture to a harmless level, has not only not been achieved, but the situation has worsened. The targets that have been achieved are mainly those that are the responsibility of the sciences, namely target 9.1 to identify invasive species and target 19.1 to improve knowledge about biodiversity and its functions. Target 17.1, to develop a national biodiversity strategy, was also achieved, but so far it exists only on paper in most countries. Overall, therefore, the picture is bleak. The protection of biodiversity has not made any progress for decades.

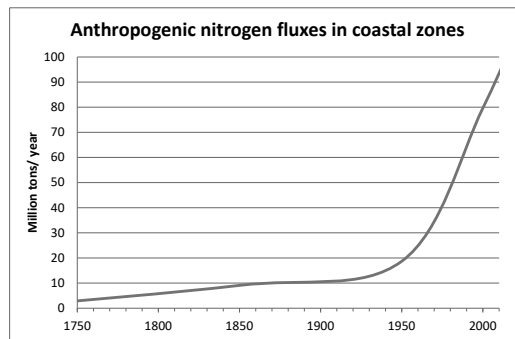
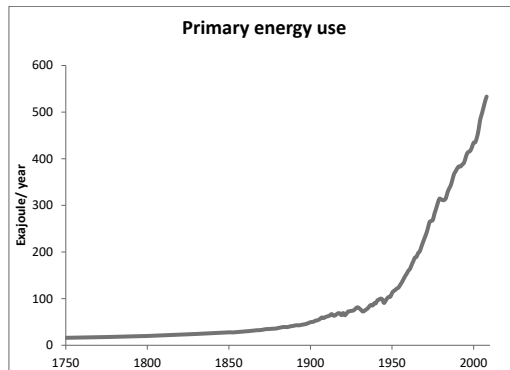
2.6 *The great acceleration*

So far, we have considered the two key problems of global warming and biodiversity loss—representative of the five transgressed planetary boundaries—more or less in a snapshot. However, they become much more acute when the development over the last few decades or centuries is taken into account. This is exactly what the International Geosphere-Biosphere Programme (IGBP) did in a research project that was completed in 2015. As a representative example, the research group examined twelve socio-economic and twelve ecological indicators and determined their globally aggregated data for the years 1750 to 2010 (Wendy Broadgate et al. 2014).

- The 12 socio-economic indicators are: (total) population; real gross domestic product (GDP); foreign direct investment; urban population; primary energy consumption; fertiliser consumption; large dams; water use; paper production; transport; telecommunications; international tourism.
- The 12 ecological indicators are: carbon dioxide; nitrous oxide; methane; stratospheric ozone; surface temperature; ocean acidification; marine fish catch; shrimp aquaculture; nitrogen in coastal waters; rain-forest loss; human-designed land areas; degradation of the terrestrial biosphere.

The data obtained were finally entered into diagrams whose X-axis depicts time (Will Steffen et al. 2015a). The unsurprising yet impressive result is that practically all curves look more or less the same: Until 1950 they undergo a rather low, flat course; from 1950 onwards they rise steeply. In other words: since 1950, the socio-economic standard of living has been rising steeply globally—but with it, almost to the same extent, the destruction of the environment. And despite all the climate and biodiversity summits, there is still no sign of a reversal in this trend. So, we are buying social standards at the expense of the environment and our fellow human beings, and we are doing so ever faster and more intensively. The time for a reversal is running out faster and faster!

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Charts: Primary energy use (socio-economic indicator) and anthropogenic input of nitrogen into coastal waters (ecological indicator) from 1750 to 2010 (Source: Will Steffen et al. 2015).

2.7 Regional inequalities. The World Risk Index

Now, the burdens of planetary boundary transgressions are very unequally distributed globally. And just as unequally distributed are the abilities of individual societies to manage the risks they face in such a way that they remain manageable overall. In order to draw attention to this problem, the Institute for International Law of Peace-Keeping and International Humanitarian Law (IFHV) at Ruhr University in Bochum has been producing an annual World Risk Report (<https://weltrisikobericht.de/>) on the basis of the World Risk Index since 2018. It is published on behalf of the "Bündnis Entwicklung hilft" (Alliance Development Helps), in which nine German development aid organisations, including several of the two large Churches, have joined forces. The concept of the World Risk Index

was developed together with the Institute for Environment and Human Security at the United Nations University (UNU-EHS).

The World Risk Index indicates the disaster risk from extreme natural events for 180 countries around the world. It is calculated per country by multiplying exposure according to vulnerability. *Exposure* represents the natural threat posed to a country by earthquakes, hurricanes, floods, droughts and rise in sea-level. Apart from earthquakes, all these phenomena are linked to the anthropogenic greenhouse effect and are at least exacerbated by it, and in some cases even generated by it in the first place. *Vulnerability* maps societal vulnerability and is made up of three components that are weighted equally in the calculation:

- *Vulnerability* describes the structural characteristics and framework conditions of a society and denotes the probability of it suffering damage in the event of an extreme natural event.
- The category of *coping* includes various capacities of societies to minimise the negative impacts of natural hazards in the short term and directly through actions and available resources.
- *Adaptation* is understood as the measures and strategies of societies to deal with the negative impacts of natural hazards that lie in the future. In contrast to coping, adaptation is understood as a long-term process that also includes structural changes.

The result shows that the individual countries represent very different typologies. Some countries have

- a *very low risk* ($< 3.3\%$) due to low exposure and very low vulnerability: these countries include, for example, Germany (exposure $E = 11.5\%$, vulnerability $V = 22.8\%$, risk $R = E \times V = 2.6\%$), Austria ($E = 13.2\%$, $V = 23.2\%$, $R = 3.1\%$) and Switzerland ($E = 9\%$, $V = 23.2\%$, $R = 2.2\%$). The German-speaking region is thus privileged in every respect, and yet the storms of recent decades are making life increasingly difficult for the forestry sector and the dry summers for forestry and agriculture, and in the mountain valleys there is an increasing threat of mudslides and avalanches due to climate warming. Locally and sectorally, even the privileged countries are facing enormous challenges.
- a *very low risk* due to very low exposure despite medium vulnerability: an example is Mongolia ($E = 6.9\%$, $V = 43.2\%$, $R = 3.0\%$). Although it is not among the world leaders in socio-economic terms, its risk is exceptionally low because the country is not threatened by any major natural hazards.
- a *high risk* due to very high exposure, despite very low vulnerability (between 7.59% and 10.75%): A striking example is Japan ($E = 38.7\%$,

2. Looking into the abyss. The analytical tool of planetary boundaries

V = 24.9%, R = 9.6%). The country is located in a zone that is extremely prone to earthquakes and tsunamis. Therefore, despite its highly developed industry and great prosperity, it is exposed to high risks. Not least the meltdown at the Fukushima power plant in 2011 due to a tsunami demonstrated this impressively.

- a *very high risk* due to very high exposure and vulnerability (between 10.76% and 49.74%): This applies to a number of African countries, e.g. Cameroon (E = 20.3%, V = 63.8%, R = 13.0%). But the Philippines (E = 42.3%, V = 49.6%, R = 21.0%) also belong to this category. They are massively disadvantaged in terms of both natural conditions and societal resilience and must therefore bear the greatest burden of planetary boundaries despite their low carrying capacity.

Overall, Europe and North America have a low risk, while Central America, Africa and Southeast Asia have a high risk. It is therefore precisely those countries that contribute less to global warming that, with a few exceptions, are exposed to a particular risk and have very little resilience to deal with the consequences of natural disasters. This is true even if one excludes earthquakes as not being caused by global warming.

In contrast to the World Risk Index, the Climate Risk Index by Germanwatch (<https://germanwatch.org/de/kri>) measures the frequency and the extent of economic damage caused by climate-related natural disasters. Looking at the period from 1999 to 2018, the following countries top the rankings: 1 Puerto Rico, 2 Myanmar, 3 Haiti, 4 Philippines, 5 Pakistan, 6 Vietnam, 7 Bangladesh, 8 Thailand, 9 Nepal. One can quickly see that the overall result converges with the World Risk Index: The particularly poor countries are especially affected by global warming, which, however, is mainly caused by the rich countries. This imbalance will have to be taken into account in the assessment and in the development of solutions.

2.8 The two central causes: Economic activity and lifestyle

How far can we put a strain on the earth's ecosystem without risking its permanent collapse in essential parts? Looking at the earth in terms of this question is, on the one hand, focused on the consequences for humanity and thus anthropocentric, and on the other hand, within this framework, focused on the functional benefits. It is a classic technocratic approach. It ignores the beauty of the planet as well as the needs of non-human creatures. The concept of planetary boundaries is thus hardcore economically oriented. On the one hand, this is its methodological limita-

tion, but on the other hand it is its enormous opportunity, because it offers the prospect of convincing hard economists, for a large part of current ecological problems are economically induced and can therefore only be improved through reform of the economic system.

The economy has exploded in industrialised countries and now also in emerging countries within a century. We rightly speak of an "industrial revolution", just as we refer to the sedentarisation of humankind as the "Neolithic revolution". This revolution has overtaken the societies concerned in many respects. Above all, their cultures and lifestyles have changed dramatically. But human impact on the environment has also been revolutionised. The pre-industrial "ecological footprint" of humanity was tiny compared to the industrial one. Environmental ethics were therefore only necessary to a very modest extent, for example to limit local water pollution, to prevent regional deforestation or to equitably share grazing on communal lands.

The *social* upheavals triggered by the economic explosion of industrialisation have now been contained or even reversed in many democracies. The concept of the social market economy has been enforced, which places limits on the economy where it wants to shed its social responsibility. However, national social market economies are on shaky ground as the market has become globalised and undermines many social achievements of nation states. Migrant and temporary workers from poorer countries often do not participate in the social standards of richer countries. Suppliers and entire manufacturing sectors are located abroad anyway, where low wages and a lack of social protection are the order of the day. Many social problems have not been solved but only externalised. From a global perspective, the social containment of the economy has not yet achieved its goal.

In any case, the *ecological dislocation* triggered by the economic explosion of industrialisation was not recognised until much later. While the beginnings of social legislation date back to the 19th century, environmental legislation only took off in the 1970s. And just as in the 19th century it was the labour movement, in the second half of the 20th century the environmental movement was the decisive driving force. With the Fridays for Future protests, it has gained unprecedented strength since 2018. However, it remains to be seen whether this will be sufficient for effective ecological structural change.

What do we learn from these very fundamental considerations? Ecology must be thought of even more globally than social issues. For goods and services, national borders are already not a decisive obstacle. The US–Chi-

nese trade war of the last few years will do little to change this. The environment, more than anything else, does not adhere to national borders. All nine planetary boundaries have planetary impacts by definition. Of course, they impact in different ways regionally. But they do so according to their own laws. Creation ethics must therefore look for concepts that are globally implementable and acceptable.

A second insight is that we must not play ecology and social issues off against each other. This insight was already shaped by the UN Conference for "Environment and Development" (UNCED) in Rio de Janeiro in 1992. In his encyclical *Laudato si'* in 2015, Pope Francis also attributed a central role to it. Ecological and social justice are interdependent in many ways. Ultimately, the poorest people always suffer the most from environmental disasters because they have the fewest resources to protect or safeguard themselves against them. And vice versa, pursuing social policy at the expense of the environment and understanding it in such a way that every person should have his or her own car, his or her annual flight on holiday and his or her portion of meat with every meal will not add up. Taking social and ecological requirements into account together is not trivial. But playing them off against each other is fatal in every case.

In addition to social and ecological dislocation, the economic explosion of industrialisation has also triggered *economic dislocation*, which is often overlooked. It is not uncommon for successful companies to be ruined because they act too ecologically or too socially—or simply because they make too little profit compared to the expectations of investors. It is not a question of companies making losses or mismanaging, but of well and solidly run businesses that are not able to cope with the harshness of unbridled competition. The fact that such companies disappear from the market is counterproductive, at least from an economic point of view. Moreover, and this is the idea behind the concept of planetary boundaries, ecological processes also trigger economic consequences. A functioning environment is the prerequisite for successful economic activity. So, when the earth's ecosystem reaches its limits, the economy cannot be indifferent to it.

The economic upheavals make it particularly clear that the world economy is a system, a functional unit that runs according to its own rules. Those who want to change it must therefore change the system and not be content with individual ethical appeals to individual economic actors. Environmental ethics needs individual and socially ethical considerations in equal measure. Only when these complement each other can the path

to an ecological and social economy be opened up. We will consider this specifically in chapter 8.

At the same time, however, the tempting tendency to shift all ecological and social responsibility onto "politics" and "the economy" must be resisted. The enormous dynamism that the economy has acquired since the industrial revolution did not only come from the economy itself. Rather, it also came about because it made possible a standard of living that was tempting for most people. Beyond the subsistence level, no one is forced to run on the hamster wheel of the economy. And yet that is exactly what most people have done over the last two centuries. The economy does not force people to join in, but lures, seduces, awakens the desire for more and more... and most people let themselves be taken by surprise by its temptations.

Thus, without the question of creation-compatible lifestyles, which I discuss in chapter 9, ethics of creation are also inconceivable. In pre-industrial times, this question was meaningless for most people because they were fighting for their very existence. In industrial and post-industrial times, however, this question becomes the key to the future: How much consumption of material goods is good for us? How much do we really need? How can we live well without overusing the earth? In the face of these questions, we are admittedly faced with a considerable problem: "we cannot claim to have a sound ethics, a culture and spirituality genuinely capable of setting limits and teaching clear-minded self-restraint." (LS 105) So again we come back to the problem of limits, this time not so much from a scientific as from an anthropological and ethical point of view: What significance do limits have for the success of life?

2.9 *Boundaries in an anthropological and ethical perspective*

Limitations are highly suspect in modern discourse on freedom because they are understood primarily, often even exclusively, as a restriction of freedom. Therefore, modernity tries to overcome limits altogether. But is that possible at all? And if it were possible, would it make sense?

In the encyclical *Laudato si'*, the reference to limits plays a not insignificant role. First of all, the Pope refers to the concept of planetary boundaries when he writes: "The exploitation of the planet has already exceeded acceptable limits and we still have not solved the problem of poverty." (LS 27). In the further course of the text, however, Pope Francis then shows that the concept of planetary boundaries contains much more

potential, anthropologically and ethically speaking, than it immediately indicates: Deliberately anthropocentric in conception for strategic reasons, it leads beyond anthropocentrism³ because humans, animals and plants benefit together when the ecosystem's stress limits are respected, and suffer together when they are exceeded. For strategic reasons, it is deliberately benefit-focused and transcends the benefit perspective because behind the quantitative metrics, qualitative values and notions of good living shine. The concept of planetary boundaries thus overcomes modern industrial society and its technocratic logic with its own weapons and opens up a view of larger contexts.

But these larger contexts need to be opened up. "The time has come to pay renewed attention to reality and the limits it imposes; this in turn is the condition for a more sound and fruitful development of individuals and society." (LS 116). In ecological ethics, limits have received significant attention from the beginning. For example, the first report of the Club of Rome in 1972 was entitled "The Limits to Growth". The ecumenical assemblies of Stuttgart (EAS) in 1988 and Dresden (EAD) in 1989 in the framework of the conciliar process for justice, peace and the integrity of creation also work with the concept of limits at central points, in contrast to the first European Ecumenical Assembly in Basel (EEA) in 1989, in which the idea plays no role⁴. So, what might the outlines of an anthropology of the limits look like?

First of all, a *creation-theological or existential-anthropological* insight comes into play: limits are constitutively part of being a creature and thus also of being human: Every human being is a finite creature (EAD 1/(42))—spatially, temporally, but also in terms of its possibilities. All forms of earthly existence gain their identity from limitation (Aristotle, *Metaphysics* V, 17, 1022a 8ff: *πέρας*, limit). If they were limitless, they would not be "definable" at all, literally: not containable. Therefore, "identity is a formula for limit" (Hanna-Barbara Gerl-Falkowitz 1996, 67).

Dealing with limits is therefore a central moral task because it creates and determines identity. Ultimately, this is the moment that elevates the human being to the status of subject: "The human being experiences him-

3 I use the terms anthropocentrism/anthropocentric as distinct from anthropocentrism/anthropocentric. The differentiation and definition of these terms is given in the introduction to chapter 5.

4 The texts of the three ecumenical assemblies are documented together in: Michael Rosenberger 2001, 309–498. Further places of publication for the individual texts are also mentioned there.

self precisely as a subjective person, insofar as he brings himself before himself as the product of what is radically foreign to him.... It is precisely this being brought before himself, this confrontation with the wholeness of all his conditions, this conditionality, that shows him to be more than the sum of his factors." (Karl Rahner 1976, 40). The self-development of the human being takes place in the free, responsible acceptance of his or her own radically limited and limiting future. The principled affirmation of limits is therefore an indispensable component of the affirmation of one's own existence. Only this makes true humanity possible (EAS 242, EAD 1/(42)) as well as true freedom (EAD 8/(1)).

Boundaries are, at the same time, the enabling condition of community: "Only in such a way that one is not everything and lives everything is common life possible." (Eberhard Schockenhoff 1993, 46). From modern identity theory we know that identity grows out of relationships, but relationships are only possible on the basis of an already existing identity. Identity and relationality are mutually dependent and constituted.

Boundaries will always also remain painful, especially when we think of limitation through illness and death. So, they must not be transfigured one-sidedly. Limits are not an end in themselves. Nevertheless, they offer a great opportunity, for they activate people and motivate them to help shape a world that takes away as much of the horror of limits as possible (EAD 1/(42)). Their denial, on the other hand, paralyzes and hinders the development of the human being, for example in the direction of more ability to experience and care (EAS 242), creativity and understanding (EAD 10/(12)). In this context, the acceptance of limitations is not to be understood as pure passivity or acceptance of external processes as a matter of fate, but as creative shaping, sometimes also shifting or eliminating limitations where it makes sense and is possible. But just as boundaries are not an end in themselves, neither is their removal. Rather, it is about their considered and orderly integration into one's own reality of life so that it can be fruitful and fulfilled.

Ethically, various attitudes of the critically reflective acceptance of limits follow from this existential-anthropological fundamental consideration: humility as the free affirmation of one's own limitedness (EAS 181), moderation as self-limitation for the sake of others, and willingness to renounce as self-limitation for the sake of a greater hoped-for "gain" (EAS 230). In the course of this study, we will reflect on such attitudes in detail (chapter 9). However, it should not be overlooked that attitudes always need the support of framework conditions (EAS 206, EAD 12/(11)) and of the community (EAD 8/(7)).

In the previous sub-chapter, we saw that well-founded ethics of creation cannot do without considering its *economic dimension*. This also applies to reflection on the meaning of limits. Economics assumes that human desires are in principle limitless. However, they are confronted with narrowly limited material resources for satisfaction—a realisation that is still highly insufficiently taken into account in the current concepts of economic growth and even more so in public discussion (cf. on the following chapter 8.4). Thus, the Ecumenical Assemblies of 1988 and 1989 state that the belief in unlimited quantitative economic growth and technical progress without end is a socially established form of denial of our limits (EAS 181 and EAD 1/(42)). Pope Francis also criticises the "idea of infinite and limitless growth, which so excited economists, financial experts and technologists. But this growth presupposes the lie concerning the unlimited availability of the planet's goods, which leads to 'squeezing' it to the limit and beyond." (LS 106).

One, if not the central paradigm of modern economic theories, the growth paradigm, is thus fundamentally called into question by the identification of ecological capacity limits. This does not necessarily mean that it must be abandoned, but it does at least require fundamental correction. This applies analogously to the central paradigm of modern social theories, the *freedom paradigm*. Boundaries are highly suspect in modern discourse on freedom because they are understood primarily, in radical constructivist approaches even exclusively, as a constructed and thus unnecessary restriction of freedom. Now, it cannot be denied at all that the questioning and overcoming of limits has brought enormous progress to humanity—technically as well as socially. A renaissance of the pre-modern tendency to accept limitations unquestioningly and be resigned to fate would therefore be completely misguided. Nevertheless, Pope Francis is right in saying that many wounds in the social sphere and in nature "are ultimately due to the same evil: the notion that ... human freedom is limitless." (LS 6)

In ethical terms, freedom means—as paradoxical as it sounds—self-limitation through morality. Freedom means "finding the law which alone is capable of necessarily determining it [the will, MR]" (Immanuel Kant, Critique of Practical Reason AA V 29). It is "independence of the will from every other except the moral law alone" (Immanuel Kant, Critique of Practical Reason AA V 94). Freedom therefore means binding oneself to the law of reason out of insight. He who follows ethical principles is free, for only he can want all people to act as he does, as Kant says in his famous categorical imperative: "Thus a will to which the mere legislative form of the maxim can alone serve as a law is a free will." (Immanuel Kant,

Critique of Practical Reason AA V 29). This is a significantly different understanding of freedom than the societally dominant one.

Such an understanding of morally determined freedom needs limits, if only because this is the only way to realise the freedom of all and not only of a few: "To ensure economic freedom from which all can effectively benefit, restraints occasionally have to be imposed on those possessing greater resources and financial power." (LS 129). However, this justification of the limitation of human freedom with social considerations must always be accompanied by justification using human bondage to nature: a blind person does not have the freedom to see; a paralysed person does not have the freedom to walk; a child does not have the freedom to drive a car, and neither does a person with dementia. Freedom therefore sometimes means being able to do and not do what one intuitively does not want to do but sees as necessary due to natural limitations. Society can and should try to reduce such natural barriers as much as possible, through guidance systems for the blind, electric wheelchairs and other aids. But this is only possible to a limited extent. And no human being can overcome the hardest limit, death. Free then is not who decides to want to live on forever, but free is who can accept death as a "sister" like Francis of Assisi.

In Europe, from 1945 until the coronavirus pandemic, the majority of people hardly had to experience permanent limitations due to nature. Unlimited freedom seemed possible. And wherever resistant phenomena such as the dramatic loss of biodiversity or global warming became apparent, they were successfully suppressed and literally nothing was done. This has strengthened many in the false attitude of claiming absolute freedom. Yet freedom is not the overcoming of all limits, but their fair and prudent shaping, which makes them open to fulfilment and happiness. Almost 100 years ago, Romano Guardini (1925, 208) already formulated: "To the *conditio humana* belongs precisely the modesty in the limit which is set to its cognition. This drawing of boundaries, far from being a torturous pruning and barrier, is ultimately the *conditio sine qua non* for the perfection of the human being: We must not deny the limits. We cannot transcend them. But we are to overcome them by freely affirming and completing them, thus making them the law of perfection."

2.10 A New Age: The Earth in the Anthropocene

Man has taken the earth almost completely into his service. There are practically no natural areas left that have not been significantly changed

and shaped by him. This is the core thesis behind the term "Anthropocene" (Paul Crutzen/ Eugene F. Stoermer 2000). Literally, it means "the humanly [made] new" (from Greek *ἄνθρωπος*, human, and *καινός*, new). Linguistically, Crutzen and Stoermer are thus following on from the term "Holocene", "the completely new" (from Greek *ὅλος καινός*), which describes the post-glacial epoch of the last ten to twelve thousand years, i.e. the period since the Neolithic Revolution, and which probably became established at the Third International Geological Congress in Berlin in 1885⁵. In terms of content, they claim that a new Earth Age began with the Industrial Revolution, whose start they place roughly at the invention of the steam engine by James Watt in 1784 (Paul J. Crutzen/ Eugene F. Stoermer 2000, 17)—a striking thesis that has since gained wide scientific acceptance. Talk of the Anthropocene has been widely received, both in specialist literature and in government documents, even if the "International Commission on Stratigraphy", which is officially responsible in this respect, has not yet recognised the term as a new geological epoch.

Humans have become one, possibly the most important factor influencing the earth's biological, geological and atmospheric processes. The term "Anthropocene" could therefore also be translated as "human age". Paul Crutzen and Christian Schwägerl write: "For millennia, humans have rebelled against the superpower we call 'nature'. In the 20th century, however, new technologies, fossil fuels and a rapidly growing population have led to a 'great acceleration' of our own capabilities. We are taking control of the realm of nature, from climate to DNA, albeit clumsily (...) Today we live in human systems in which natural ecosystems are embedded. The barriers between nature and culture that have been maintained for a long time are breaking down... (...) It is no longer 'us against nature'. Instead, today we decide what nature is and what it will be in the future. (...) we live in the Anthropocene, which highlights the high degree of responsibility of humanity as stewards of the earth. (...) Imagine our descendants in the year 2200 or 2500. They might compare us to aliens who treated the earth as if it had merely been a stopover for refuelling. Or, even worse,

5 Crutzen and Stoermer locate the congress in Bologna, many others in London. All agree that it was the third International Geological Congress in 1885, but that one was held in Berlin. The second congress was held in Bologna in 1881, and the fourth in London in 1888, cf. The International Geological Congress (A Brief History), in: <http://iugs.org/uploads/images/PDF/A%20Brief%20History.pdf> (retrieved: 20.2.2018). The term "Holocene" was first used by Charles Lyell in 1833, so it took more than half a century before it was officially recognised. In this respect, the term "Anthropocene" still has some time left.

they might call us barbarians who plundered their own home. (...) Consider: in this new age, we are nature." (Paul J. Crutzen/ Christian Schwägerl 2011)

These are just a few of the plausible examples that Crutzen and Stoermer cite for the Anthropocene hypothesis: At present, farm animals bred by humans have more biomass worldwide than wild animals; humans are responsible for more than half of quite a few biogeochemical substances in the earth's atmosphere, such as methane, nitrogen and phosphorous; almost half of the land area has been transformed by humans (Paul J. Crutzen/ Eugene F. Stoermer 2000, 17).

So, there is no question that there is practically no "untouched nature" left today. There is also no question that humanity can only overcome the problems of its own making with a combination of retreat (degrowth, i.e. reduction of resource consumption in the economy and consumption as well as reduction of the world's population) and design (environmental management, environmental technologies). For this second aspect, however, Crutzen and Schwägerl propose such controversial technologies as carbon capture storage, i.e. the injection of carbon dioxide into underground cavities, and geoengineering, i.e. large-scale interventions in geochemical or biogeochemical cycles of the earth by technical means (Paul J. Crutzen/ Christian Schwägerl 2011). This is rightly criticised by many colleagues in the environmental ethics debate. However, one does not have to go as far as Eileen Crist, who rejects the concept of the Anthropocene as such along with the proposed solutions (Eileen Crist 2020, 136–138).

One is the question of solutions—we will deal with them later in this book—the other is the question of analytical tools. As far as the latter is concerned, the classification of the present age as the Anthropocene is quite suitable. The term makes clear the totality of human influence on nature. We humans decide today "what nature is and what it will be in the future" (Paul J. Crutzen/ Christian Schwägerl 2011). This imposes on us an enormous responsibility that we can never fully fulfil.

3. Building an Ark. Impulses from biblical creation texts

In 1971, the international non-governmental organisation Greenpeace was founded in Canada. Its concern is twofold: peace among peoples and with creation. The compound name Greenpeace is meant to express this dual goal. After only a few years, the organisation was already using its own ship for many of its campaigns. Now in its third generation, it is called "Rainbow Warrior" and bears the symbol of the rainbow and a white dove with an olive branch on its bow. This is a clear allusion to the biblical story of Noah and the great flood (Gen. 6–9). Sociologically, this is an interesting process: a secular, ideologically neutral NGO has taken its emblem from the Holy Scriptures of the Jewish and Christian religions.

One could criticise this process from two sides: From the point of view of religions, Greenpeace's choice of emblem could be understood as encroaching and appropriating, in extreme cases even as blasphemous, and one could claim that the Noah narrative is about more or other things than environmental protection and world peace. From the point of view of secular society, it could be assumed that Greenpeace is trying to proselytise for a certain religious tradition or to ingratiate itself with it, i.e. that it is by no means ideologically neutral. Neither criticism has been seriously raised. However, this does not necessarily mean agreement. It could also mean that the Greenpeace logo is no longer considered.

On the other hand, the choice of symbolism seems to me to be extremely significant. On the one hand, it draws attention to the fact that an NGO that engages in altruistic activities with a high level of personal commitment needs a "mission" and sources of strength to realise it. The secular humanist and biologist Edward O. Wilson expresses this need more explicitly than Greenpeace. He needs something like "grace", but firmly rooted in the earth: "In essence, I still longed for grace, but rooted solidly on Earth" (Edward O. Wilson 2006, 43–44). On the other hand, Greenpeace's choice of symbolism points to the fact that the Bible offers a rich reservoir of texts that transcend the boundaries of all religions and world views and can serve as a "mission statement" and source of strength at the same time.

This is precisely the core thesis of Alfons Auer's "Autonomous Morality", which, after hard and painful debates, is now a firm part of moral theology, at least in the German-speaking world (Alfons Auer 1971 and 1984²,

212–215). In it, Auer denies that there is a material ethical proprium, a kind of "special morality" for the Christian (or any other) religion. "The human is human for pagans as well as for Christians." (Alfons Auer 1984², 212). So there is no ethical norm that would only apply to Christians or could only be understood by them. Ethical demands must be reasonably comprehensible and binding for all people. Nevertheless, faith opens up a horizon of meaning that integrates, stimulates and criticises the formation and justification of ethical judgements.

- *Integrates*: Faith offers a broader horizon. Thus, the demand to respect the dignity of every creature can be seen as a demand for justice even without faith. But when Christians recognise a being loved by God in every creature, the view opens up the possibility of deeper connections.
- *Stimulates*: The tradition of faith has a strong narrative component. Concrete, vivid narratives in particular can stimulate a more intensive search for moral truth. The Noah narrative, like the biblical creation narratives as a whole, is such a narrative.
- *Criticises*: Ethical judgement is always in danger of settling for mediocrity. Faith, on the other hand, nourishes the inner hunger for more, for the "greater righteousness" (Mt. 5:20), for going beyond the limits. It criticises existing injustices and shortcomings. One thinks of some prophetic texts that do not hesitate to denounce the regional destruction of the environment by the powerful of their time (Is. 14:8; 2 Kings 19:23 etc.).

When Auer speaks here of "the Christian faith", he does not only or primarily mean the single contents of faith (*fides quae*), but above all the practised performance of faith (*fides qua*); one could also say: "the believing" of Christians. This performance manifests itself in very earthly things: in telling (biblical and non-biblical) stories, in singing songs, in performing rituals, in saying prayers, and in experiencing community. "Faith" in Auer's sense is thus meant holistically, perhaps even more emotionally than rationally (though not irrationally), in the sense of loving, trusting and devotion. Precisely because of this emotional penetration, faith can not only integrate thinking—a rather rational event—but also stimulate and criticise thinking—two rather emotional processes.

Without explicitly referring to Auer, Pope Francis framed his 2015 encyclical *Laudato si'* in precisely this way. He writes: "Given the complexity of the ecological crisis and its multiple causes, we need to realize that the solutions will not emerge from just one way of interpreting and transforming reality. Respect must also be shown for the various cultural riches of different peoples, their art and poetry, their interior life and spirituality.

3. *Building an Ark. Impulses from biblical creation texts*

If we are truly concerned to develop an ecology capable of remedying the damage we have done, no branch of the sciences and no form of wisdom can be left out, and that includes religion and the language particular to it. The Catholic Church is open to dialogue with philosophical thought; this has enabled her to produce various syntheses between faith and reason... Furthermore, although this Encyclical welcomes dialogue with everyone ..., I would like from the outset to show how faith convictions can offer Christians, and some other believers as well, ample motivation to care for nature and for the most vulnerable of their brothers and sisters." (LS 63–64)

Philosophical thinking, as we will see in the following chapters 5 and 6, will provide the rationale for sustainable environmental ethics. But it needs the experiences of the most diverse cultures, religions and spiritualities to motivate and move from thinking to action. This is entirely in the spirit of Auer's autonomous morality and also in the spirit of philosophy. Thus, philosopher Konrad Ott (2016, 96–97) writes: "Thus it could be that the moral and ethical conflicts of the Anthropocene... can be fought out nowhere better than within the horizon of biblical morality."

So, what criticising, integrating and stimulating impulses can the Christian faith bring to modern environmental ethics? To answer this, I would like to look at two theological sources of knowledge ("loci theologici") in this and the next chapter: the Bible and liturgy. Both hold enormous potential. However, both have also been misinterpreted (Bible) or misdeveloped (liturgy) in the course of history. Therefore, in this biblical chapter, I will begin with some notes on such aberrations and also on the methodology of biblical interpretation. I will then go through the first nine chapters of the Bible to finally open up some more central texts and images from the Bible for creation ethics.

3.1 *The ecclesiastical aberrations in the interpretation of biblical creation texts*

In 1967, the medievalist Lynn White published a sensational article in the scientific journal "Science" on "the historical roots of our ecological crisis". In it, he proved that the technological and scientific dynamism of Western Europe, which began in the 11th century and continues today, has its roots in the widespread Christianisation by the Carolingians in the 9th century. This led to a combination of two basic spiritual attitudes: Firstly, the biblical creation narratives were understood in such a way that everything created existed solely for the benefit and well-being of man,

because he alone was God's image. Christianity had thus become the most anthropocentric religion in the world. "God planned all of this explicitly for man's benefit and rule: no item in the physical creation had any purpose save to serve man's purposes. And, although man's body is made of clay, he is not simply part of nature: he is made in God's image. Especially in its Western form, Christianity is the most anthropocentric religion the world has seen. (...) Christianity, in absolute contrast to ancient paganism and Asia's religions (except, perhaps, Zoroastrianism), not only established a dualism of man and nature but also insisted that it is God's will that man exploit nature for his proper ends." (Lynn White 1967, 1205)

Secondly, the significant difference between the Latin Western and Greek Eastern Churches has to be explained, for only the Latin Church had produced the aforementioned technological and scientific dynamic, while the Christian East had lagged behind technically and scientifically. Here, White refers to the Voluntarism of the Western Church, which emerged in the 11th century, and which places the human will and its freedom before or above the knowledge of reason. In contrast, the Greek Eastern Church remained intellectualistic, i.e. it placed the knowledge of reason before will and freedom.

This leads to the following conclusion for White: "first, that, viewed historically, modern science is an extrapolation of natural theology and, second, that modern technology is at least partly to be explained as an Occidental, voluntarist realisation of the Christian dogma of man's transcendence of, and rightful mastery over, nature" (Lynn White 1967, 1206). The ecological crisis cannot be solved simply by more natural science and more (environmental) technology, but only by spiritual conversion. The creation mysticism of Francis of Assisi and his idea of fraternity with all creatures lends itself to this, White concludes.

With this small essay, White initiated a debate that has not died down to this day. However, his thesis has often been coarsened and robbed of its temporal and spatial limitations. The medievalist White only analyses the Middle Ages. He does not ask where the medieval interpretations of the biblical narratives come from and whether they are exegetically correct. He also does not ask what is at the origin of Western voluntarism and why this only affected the Christian West, but not the Christian East. Finally, he does not analyse post-Reformation and modern developments, which suggest that it was not so much Catholicism as Protestantism (especially Calvinism and the Free Churches) that promoted environmental destruction (cf. Peter Hersche 2020 and 2020a). As a medievalist, White sticks to his last. However, the title suggests that one has arrived at the roots of

history, as if there were no prehistory to the Middle Ages. This is precisely what leads to uncovered generalisations and very sweeping accusations of "Christianity". In the German-speaking world, it was above all Carl Amery who spoke out in 1972 with his monograph on the "merciless consequences of Christianity" and Eugen Drewermann in 1986 with his treatise on the "destruction of the earth and of man in the legacy of Christianity".

In the meantime, the accusations have been dealt with in a clean and nuanced way, e.g. by Udo Krolzik in 1979, Hans J. Münk in 1987 and Simone Rappel in 1996. This book, which has a systematic-ethical and not an analytical-historical intention, is not the place to recapitulate the debate anew. However, it will be important to look at both the biblical texts and, in the following chapter, the liturgical practices of Christianity self-critically and honestly through the filter of ecologically motivated criticism of Christianity.

The Churches took up Lynn's criticism late, but very clearly and acknowledged their complicity. The European Ecumenical Assembly in Basel in 1989 stated: "We have failed because we have not borne witness to God's caring love for all and every creature and because we have not developed a lifestyle that corresponds to our self-understanding as part of God's creation." And: "Conversion to God (metanoia) today means the commitment to seek a way out of the separation between human beings and the rest of creation, out of human domination over nature, out of a lifestyle and economic modes of production that seriously damage nature, out of an individualism that violates the integrity of creation for the sake of private interests, into a communion of human beings with all creatures in which their rights and integrity are respected." (EEA 45)

Pope Francis also candidly admits in 2015: "This allows us to respond to the charge that Judaeo-Christian thinking, on the basis of the Genesis account which grants man "dominion" over the earth (cf. Gen. 1:28), has encouraged the unbridled exploitation of nature by painting him as domineering and destructive by nature. ... Although it is true that we Christians have at times incorrectly interpreted the Scriptures, nowadays we must forcefully reject the notion that our being created in God's image and given dominion over the earth justifies absolute domination over other creatures." (LS 67), which is all the more reason to ask what the biblical texts really mean.

3.2 Hermeneutical and exegetical preliminary remarks on Gen. 1–9

Hermeneutically, we must first clarify what the biblical texts mean by "creation" (Karl Löning/ Erich Zenger 1997, 17–20, 40–42). In biblical thought, "creation" means first and foremost the foundation of a relationship between Creator and creature that is ongoing and has a goal. This goal is already recognisable in the origin and thus "real", effective. Despite the transgression of set boundaries (Gen. 3) and the act of violence by human beings (Gen. 6), it is not ultimately threatened.

The biblical creation *narratives* are written as *myths*. A myth describes basic features of the world as it permanently is (and not as it once was in the past!) in the form of a story that "was". The past tense of the narrative is thus a stylistic device. In the liturgy and in the telling, this history is made present, as if it were happening now, in order to lament and invoke something with it: the intercession of the Divinity in favour of life. The biblical creation narratives were told at festivals when this intercession of God in favour of life is particularly questionable: at the annual New Year's festival, which then as now raises many questions about what the new year will bring, and at the birth of a human being, when the relatives also wonder what will happen to this person in life. Thus, behind the creation narratives is primarily the question of theodicy: Is God really good and just, when there is so much suffering and hardship in creation? The creation ethical question of what contribution humans can make to the well-being of all creation, on the other hand, is secondary. The biblical narratives are not treatises on creation ethics, even though they contain a multitude of impulses relevant to creation ethics.

An important question to be clarified in advance is that of *the delimitation of the creation narratives*. Classically, the first major textual unit in the Book of Genesis has been identified in chapters 1–11, and recently Georg Fischer (2018, 72) has rejoined this debate. Then the narrative culminates in the Tower of Babel, and only the first two chapters are perceived as two distinct creation narratives. The majority of exegetes in the last 25 years, however, follow the suggestion of Karl Löning and Erich Zenger (1997, 135–142) in understanding the death of Noah in Gen. 9:28–29 as the conclusion of this first great unit of the Book of Genesis and in reading Gen. 10–11 already as a prelude to the subsequent story of the Patriarchs, for Gen. 1–9 is a self-contained composition that can be read in itself: Including the story of Noah, it is a single, coherent creation narrative that reaches its climax and crowning conclusion in God's covenant with all creatures: never again shall chaos, which is hostile to life, have the

upper hand. Never again shall the survival of living beings as a whole be endangered.

Basing my analysis on these reflections, I would like to read the creation narrative Gen. 1–9 "backwards". I will begin with the Noahide covenant as a model of justice for the present (Gen. 9), which is a response to the flood narrative Gen. 6–8, which speaks of the ecologically disastrous consequences of human violence. In a second major part, I will first read the narrative of man and animals in the Garden of Paradise and of the violation of its integrity (Gen. 2–3) and finally the narrative of the seven-day work, in which the great house of life of creation comes into being (Gen. 1). But first, I will consider one of the most beautiful creation texts in the entire Bible, Psalm 104.

3.3 *Prelude: The vision of a great family of all creatures (Ps. 104)*

At the beginning of the biblical faith in creation is the "conviction that, as part of the universe, called into being by one Father, all of us are linked by unseen bonds and together form a kind of universal family, a sublime communion which fills us with a sacred, affectionate and humble respect." (LS 89). This is magnificently expressed in Ps. 104, a wise hymn of creation (on the following cf. Karl Löning/ Erich Zenger 1997, 52–65).

Verses 1–4 portray God as a universal king who places all creation at his service: Light is his mantle, the heavens his tent, the waters the foundation of his dwelling, the clouds his chariot and the winds his wings. This God needs no intermediaries to relate to his creation—neither man nor the temple and its cult.

The powers of chaos in the form of destructive floods have also already been put in their place and overcome by God. Verses 6–9 allude to the work of creation on the third day, the separation of water and land (Gen. 1:9–10), and to the overcoming of the great flood (Gen. 6–8), which will never return: "A boundary you have set, they [the waters, MR] must not cross it; never again shall they cover the earth" (Ps. 104:9). Verse 5 preceding this passage therefore confesses the "fundamental unshakability of the earth" (Karl Löning/ Erich Zenger 1997, 53), for "for all eternity it shall not shake" (Ps. 104:5).

Verses 10–16 are dedicated to (tamed) water as the basis of life for animals and plants. Water supplies land animals and birds, grass and crops, and vines and trees. Bread, wine and oil, the prestige products of the

Mediterranean farming culture of the time, are explicitly mentioned and referred to man, his nourishment and his zest for life.

The following section of verses 17–23 is about the habitats (biotopes) and the activity times (chronotopes) of living beings: Either they have their own habitat where they are undisturbed, or they share the same habitat with each other but use it at different times—some at night, others during the day. Finally, after jubilant praise in verse 24, marine habitats and creatures are depicted in verses 25–26. Again, the allusion to Gen. 1 cannot be overlooked.

Verses 27–30 address a final theme: the neediness and fragility of creaturely life: creatures need constant nourishment, and eventually they all return to the dust of the earth. Whether they live, have enough food or die is in the hands of the Creator.

With praise of the greatness and goodness of the Creator in verses 31–35, the Psalm ends and closes the circle to its beginning.

Ps. 104 draws on an extraordinarily accurate and varied observation of nature. He "uncovers their interdependent connections, especially the constitutive interdependence of all life in the world and of the living God" (Karl Löning/Erich Zenger 1997, 53). But he does not do this from the detached, sober observation perspective of the scientist, but from the amazed, moved attitude of the participant who praises and glorifies God. At the same time, the psalmist knows about the threats to life on earth. Earthquakes, flood disasters and volcanic eruptions, even death, are named with a shudder, but then placed in the hands of God, who does what is right for his creatures.

A common thread in Pope Francis' encyclical *Laudato si'* is "the conviction that everything in the world is connected" (LS 16; cf. also LS 91; 117; 138). Later, as already quoted, the Pope speaks of the "conviction that, as part of the universe, called into being by one Father, all of us are linked by unseen bonds and together form a kind of universal family, a sublime communion which fills us with a sacred, affectionate and humble respect" (LS 89). Here the concept of family is applied to all creatures—entirely in the tradition of Francis of Assisi, who calls all living beings his sisters and brothers, for "we are not disconnected from the rest of creatures, but joined in a splendid universal communion. As believers, we do not look at the world from without but from within, conscious of the bonds with which the Father has linked us to all beings" (LS 220). This interconnectedness has tangible consequences: "Everything is interconnected, and this invites us to develop a spirituality of that global solidarity." (LS 240). "Because all creatures are connected, each must be cherished with love and

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respect, for all of us as living creatures are dependent on one another." (LS 42). These thoughts reflect much of what Psalm 104 sings about jubilantly two and a half millennia earlier. It is thus a good door opener for the first chapters of the Bible, which I will look at below.

3.4 *The Noahide Covenant as a model of justice for the present day*

3.4.1 God's Covenant with His Creation (Gen. 9)

As already mentioned, the purpose of both the flood narrative (Gen. 6–9) and the entire creation narrative (Gen. 1–9) becomes clear from its end, i.e. from God's covenant with Noah and all creatures living at present and in the future. This statement reads: God's faithfulness to his creation is greater than all human power; precisely as threatened, the earth is loved and supported by God (cf. on the following Karl Löning/ Erich Zenger 1997, 160–177). This statement is in complete agreement with God's promise to Noah in Gen. 8:21–22: Never again shall all living creatures be "smitten". The preceding flood narrative is thus an "antimythos": In it, what "was" there is fictitiously told in order to say what will never be: absolute chaos; total destruction.

This is exactly what Gen. 9 focuses on. In verses 1 and 7, the blessing of fertility and multiplication from Gen. 1 "Be fruitful, multiply and fill the earth" is repeated and affirmed. Then follows a description of the present real world. The animals live in "fear and dread" of man. They exist in competition not only with each other but also with man. Man cannot help but eat living creatures, and he is allowed to do so (verse 3). However, there are limits to his hunger: The blood, the lifeblood, remains forbidden to him: "Flesh with its life, its blood, you may not eat" (verse 4). The fact that in the ritual slaughter of Judaism and Islam, which goes back to this instruction, the blood must flow out completely, is a strong symbol of reverence. The person slaughtering or eating meat should always remember that he is consuming a living being.

Animals may be eaten under certain conditions and under the inculcation of restraint and moderation. Humans, on the other hand, may not be killed (verse 5). Gen. 9 thus reckons with a conflictual and not non-violent reality. It sees a certain amount of violence as inevitable. Life is possible in the creation house of the earth only at the expense of other life. But the two prohibitions of the consumption of blood and the killing of human beings are meant to limit and regulate violence.

In the following verses 8–17, the actual covenant is made with Noah and his family, with their descendants for all generations and with all living creatures: "Behold, I establish my covenant with you and with your descendants after you and with all living creatures among you, with the birds and the cattle and all the wild animals of the earth among you, with all that have come out of the ark, with all the wild animals of the earth in general." (Gen. 9:9–10). The fact that God's covenant is not only made with human beings seems so important to the text it is repeated again and again: It is the covenant "between me and you and the living creatures with you for all generations to come" (Gen. 9:12), "between me and the earth" (Gen. 9:13), "between me and you and all living creatures, all creatures of flesh" (Gen. 9:15), "between God and all living creatures, all creatures of flesh on earth" (Gen. 9:16), "between me and all creatures of flesh on earth" (Gen. 9:17)—as if the authors wanted to hammer it into the heads of those reading and listening: Do not forget the non-human creatures! They are my and your covenant partners, your brothers and sisters!

Gen. 9 thus sets a decisive ethical course: justice cannot be defined exclusively between humans. Justice, as demanded by the Bible, is to be done to all God's creatures. The Noahide narrative and a large part of the biblical texts as a whole represent biocentrism. Logically, the commandments of the Torah subsequently contain a series of regulations that protect animals and give them certain rights.

As a sign of the covenant, God refers to the rainbow (Gen. 9:13). Originally, it was a symbol of the bow with which the father of the gods shoots his arrows (thunderbolts) at the earth, thus a symbol of punishment, revenge and enmity. In the Noah narrative, it is turned into the positive opposite. From now on, it is supposed to be a sign of peace, the renunciation of violence and the fraternal bond between all creatures.

God offers his protection and care to creation. His attention and his offer come first. But now man owes him a response: he is to treat all creatures justly and with respect.

3.4.2 The flood of violence and the lifeboat of the ark (Gen. 6–8)

According to Gen. 6, the fact that a flood comes over the whole earth is not a whim of God, but a consequence of real deeds of earthly beings. The earth is full of the violent deeds of all beings (Gen. 6:13) and increasingly full of the wickedness of men (Gen. 6:5). In a myth, as is the narrative, the

flood, figuratively portrayed as a solitary decision of God, must be understood in real terms as a consequence of human violence and destruction. Man's actions deprive all creatures of their habitats and rob them of the air they need to breathe. Violence and destruction are like water up to their necks.

Noah recognises the signs of the times and breaks out of the cycle of violence. He builds a lifeboat, the ark, which has become a symbol of the community of fate between animals and humans that is still so well understood today: Either they share the small boat or they perish together. The story emphasises the ark's exact dimensions: "Three hundred cubits long, fifty cubits wide and thirty cubits high" (Gen. 6:15). It is also emphasised that the ark has three floors (Gen. 6:16). Thus, the narrators make a connection with the Jerusalem temple as described in Ex. 26:15–30: ten cubits high, twelve cubits wide and thirty cubits long. The ark is thus exactly ten times as long and three times as high as the temple in Exodus (Karl Löning/ Erich Zenger 1997, 166). In 1 Kings 6:2, the temple has other dimensions: thirty cubits high, twenty cubits wide and sixty cubits long. This would make the ark the same height, two and a half times as wide and five times as long as the temple (Georg Fischer 2018, 421). The most important worship, according to the statement symbolically hidden in both comparisons, does not take place in the Jerusalem temple, but where people, like Noah, work for human and non-human creatures, for peace and justice in God's house of life. In this way, the text ties in with the ancient prophetic tradition of Israel that social action is more important than participation in worship. Jesus also clearly advocated this position. The highlight of the Noahide narrative, however, is that ethically responsible action does not only concern the interpersonal sphere but must prove itself towards all creatures.

The Noah narrative is laid out in concentric circles, as is considered *opinio communis* in exegesis today. Its centre is Gen. 8:1: "Then God remembered Noah, and all the beasts and all the cattle that were with him in the ark." God is caring and wants to preserve the life of his creatures. And in fact, in the style of the entire creation narrative, the life of all (!) creatures. This is also specifically emphasised here: "There is a 'middle' with the divine remembrance in 8:1, at which events surprisingly turn to good and bring forth even better things." (Georg Fischer 2018, 401).

In the overall context of the creation narrative Gen. 1–9, the Noah narrative thus has a strong message: the ark is the small area in which the peace of creation already begins, of which Gen. 1–2 tell. Noah practises justice towards all that lives and shares the scarce resources of the tiny

boat with them. He is the prototype of what is called "the image of God" in Gen. 1:26, for his actions are similar to God's actions. Noah abides by the covenant and its righteousness before it is even made. So, one cannot understand Gen. 1–3 without Gen. 6–9 and vice versa. The two parts of the creation narrative are placed in a reciprocally interpretative context.

3.5 *The Peace of Creation as a Utopian Model for Dynamising the Present*

3.5.1 Man and animals in the garden of paradise (Gen. 2–3)

Gen. 2:4–3:24 does not offer a universal view of the world as a whole, like the Noah narrative or Gen. 1:1–2:3, but tells of a small paradisiacal garden that God creates in the middle of the desert, which is hostile to life. There he "places" a single human being and many animals (Gen. 2:5–15), which he forms out of clay and then breathes life into, in order to give the still lonely human being help. They are not the equal help he is looking for, but the story implies a great closeness and similarity between animals and humans. Both are formed of earth and animated by the living breath (*nəʔfəʕ chajjāb*: Gen. 2:7–19). Both are mortal (Gen. 3:19), although at the time the text was written there was no thought whatsoever of human beings continuing to live after death—death is the natural end of life for animals and humans. "He has life only because God breathed into him the breath of life. That this illusionless view of man is a negative answer to the question of a potential immortality of man, which was much discussed in Mesopotamia, is still shown by the fragmentary mention of the tree of life in Gen. 3:22 and the mention there of God's fear that man, already detached from God, could take from this tree of life. Man as 'dust' is, strictly logically speaking, not capable of a life without death at all." (Joachim Jeremias 1990, 33)

In particular, however, a close relationship is established through the names that humans give to animals: If the names are to express the essence of the animals—and that is what it is all about—man must know them well. In giving them names, humans establish a relationship to the animals that is more than just factual and rational because they recognise their being and show them respect. Man and animals are each other's companions and helpers, even though the animals are not equal to man. Only the woman whom God creates as the crowning achievement of his work is man's equal.

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Together, man and woman are to work in the garden or, as the Hebrew verb *abad* could also be translated (Georg Fischer 2018, 202), serve and care for it (Gen. 2:15). Human labour is thus part of the divine act of creation (Othmar Keel/ Silvia Schroer 2002, 144). Humans are allowed to use everything; it is only the tree in the middle (Gen. 3:2), which symbolises the divine order, that they are not allowed to touch. Gen. 2–3 thus reveals that the garden that God creates in the midst of the hostile, disorderly desert has an order: There is a centre in which a tree stands. The rivers that originate in the garden and flow in the four directions divide the earth into four areas. Their fullness of life flows over the whole earth—for once, the view of the narrative expands here to the global dimension. Finally, man's naming of the animals is also a "symbolic ordering of the world" (Bernd Janowski 1993, 9) in the sense of recognising their God-given nature. Man can "classify" the animals in a larger context. The giving of names is thus not to be read as evidence of man's position of dominion but stands for his ability to recognise beings (Marie Louise Henry 1993, 26–27; Henry refers to Ex. 3, where Moses cannot recognise the name of God by his own power because the essence of God is not accessible to him).

God gave all the trees in the garden to humans and animals for their use, well-being and joy. "Eden" (*edæn*), where the garden is located in Gen. 2:8, literally means "delight" or also "land of pleasure". This is a significant difference from other ancient Near Eastern creation myths: while there humans and animals are created for the benefit and delight of the deity, in Gen. 2–3 they are there for the sake of themselves and their delight in life (Othmar Keel/ Silvia Schroer 2002, 142). The narrative does not think theocentrically or anthropocentrically, but biocentrically. The fact that it was later interpreted anthropocentrically in both Judaism and Christianity is one of the tragic aberrations of both religions.

God has excluded one single tree from use. This restriction would actually be negligible. Even without the fruit of this one tree in the middle, a very good life would be possible. But the restriction offends man. He cannot bear it. All at once he perceives God as "begrudgingly withholding a privilege" (Georg Fischer 2018, 266–267), and so the human couple feel they must cross the line. Gen. 3 tells how man and woman together, and equally responsible for doing so, abuse God's trust and defy the order of the garden.

Gen. 3:14 impressively demonstrates how relationships are disturbed by the transgression of set boundaries: Enmity and opposition arise between man and the serpent, man and his habitat (soil, thistles, thorns), and man and woman. Work and birth, central orders from God to man, which

originally promised blessing, are now perceived as laborious and painful. The presumption of man and his self-conceit over set limits disturbs the community of life in the garden of paradise that God wanted and made possible. The paradisiacal peace of creation is not a characteristic of the present reality.

3.5.2 The great house of life of creation (Gen. 1)

Gen. 1 begins exactly the opposite way as Gen. 2–3. Chaos is here at the beginning, not at the end of the narrative (cf. Karl Löning/ Erich Zenger 1997, 20–24, 29–35): the great "*tohuwabohu*" (*tohû wāvohû*; Gen. 1:2), which has become a common word, translated as "desolate and confused" in the Einheitsübersetzung of 2016 or more onomatopoeically as "madness and confusion" ("Irrsal und Wirrsal") in the translation by Martin Buber (2020). According to this conception, God does not create the world out of nothing, as Christian dogma later states, but out of chaos. As such, the "non-creation" or "counter-creation" of the destructive powers retains power "after" the creative beginning: chaos constantly threatens life. God must permanently intervene, order the chaos and open up spaces for life. Many ancient oriental images testify to how the deities fight against chaos (cf. Otmar Keel/ Silvia Schroer 2002, 123–133). It is therefore a primal human experience: life is constantly threatened and must be protected, as must its habitat.

According to Gen. 1, four "elements" belong to the original chaos: the desert earth, which is hostile to life, darkness as the power of disaster, the primeval sea and "the waters". While Gen. 2 depicts chaos in the image of an arid desert, from which God has to extract a garden through irrigation, Gen. 1 depicts a water desert, from which God wrests the habitats by setting limits to the waters. Thus, Gen. 1 (as well as Ps. 104) is figuratively closer to the flood narrative. And indeed, among Bedouins there is still the dictum that more people die in the desert from too much water than from too little. They do not die of thirst but perish in floods that suddenly shoot through the wadis when it unexpectedly begins to rain. Creation in the sense of Gen. 1 then means that chaos is (partially) ordered and thus contained. God separates the light from the darkness, the water above and below the vault of heaven, the water from the dry land.

From a literary point of view, the *overall structure of the seven-day work* of Gen. 1 is tremendously well thought out and reveals the status of the text as world literature (cf. Karl Löning/ Erich Zenger 1997, 142–146). Already

in purely formal terms, the narration of the works of creation of the first to third days differs significantly from that of the fourth to sixth days. While in the first half of the week the separation of existing life-threatening realities is narrated in order to limit the chaos (light from darkness, water above from water below, water below from land), the second half of the week is about the creation of "beings" that are not there before: sun, moon and stars; animals and humans⁶. While the things separated in the first half of the week are named by God, this does not happen with the newly created beings (not even with sun, moon and stars!). Finally, while habitats are created in the first half of the week, they are populated in the second half. "Successively... the deadliness of the primordial flood is eliminated, so that finally the tohuwabohu earth becomes a nourishing (!) earth, which can serve as a habitat for the living beings then to be created." (Erich Zenger 1983, 84)

On the first, fourth (middle) and seventh (last) days of creation, the *temporal order* of the house of life is created: the daily rhythm (first day), weekly rhythm (seventh day) and monthly and annual rhythm (fourth day, symbolised by sun and moon). The narrative knows that without regularly recurring times, no life is possible on this earth. Trees prepare their buds in winter—if spring did not come or came too late, they would perish. Humans calculate the time of sowing and harvesting precisely—if it were to shift significantly, it would be problematic. So, in addition to ordered habitats (called biotopes in modern biology), there also needs to be temporal order (called chronotopes in modern biology).

While the second and third days are dedicated to the creation of habitats, the fifth and sixth days are dedicated to the *creation of living beings*: animals in the water, in the air and on the land, and humans. In the process, the habitats and living beings are paralleled: The animals of the fifth day colonise the habitats of the second, the animals of the sixth day the habitats of the third. So, it is not a question of an ontological "scala naturae". Habitats and living beings are not ordered in an ascending or descending line from the "lower" to the "higher" living being or vice versa, but according to their (living) spatial proximity to humans (Albert de Pury 1993, 139–140). The decisive structuring and interpretive principle of

6 The plants have a hybrid position in Gen. 1. They are not created by separation, but are brought forth from the earth, as are the animals. However, through classification on the third day of creation, they are part of the living space and do not count as living beings. This is where the Old Testament differs from the Greek philosophy of the time.

Gen. 1 is the distinction between living spaces and living beings, "'living space' and 'inhabitants'" (Albert de Pury 1993, 139; similarly, Erich Zenger 1995, 99) as well as their correlative allocation and embedding in supporting rhythms of life. Animals and humans are equally inhabitants of the earthly habitats and receive the same reproductive blessing and equally only plants as food. Eating meat is not permitted in this ideal situation of the peace of creation, as it would imply the killing of living beings and thus violence. As long as plants are not regarded as living beings, this reasoning works. Gen. 1 thus designs "as a positive utopia for dealing with creation a peaceful and non-violent relationship between humans and animals" (Bernhard Irrgang 1992, 130). The living creatures live in habitats that have been assigned to them, there is enough space for all of them, provided they share with each other, and there is sufficient plant food available. No creature goes empty-handed or comes up short.

Diagram: Genesis 1—outline principles (simplified in line with Erich Zenger 1983, 200)

Day 1: TIME RHYTHMS	Day and night	
	Day 2: LIVING SPACE	Sky and water
	Day 3: LIVING SPACE	Soil and plants
Day 4: TIME RHYTHMS	Sun and moon (year and month)	
	Day 5: LIVING BEINGS	Aquatic and aerial animals
	Day 6: LIVING BEINGS	Land animals and People
Day 7: TIME RHYTHMS	Sabbath (week)	

Now Gen. 1 nevertheless ascribes a special role to human beings. And it is precisely these sentences that have had the most far-reaching consequences in the history of Christianity. On the one hand, man is described as the image of God; on the other hand, he is given a "mandate to govern". Both aspects require a thorough analysis that is independent of later theological and ecclesiastical interpretations.

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In the 2016 Einheitsübersetzung, *Gen. 1:26–27* reads: "Then God said, 'Let us make man as our image, in our likeness. They shall rule over the fish of the sea, over the birds of the air, over the cattle, over all the earth, and over every creeping thing that creeps on the earth. God created man as his image, as the image of God he created him. Male and female he created them.'"

Kehl and Schroer first point out that the concept of the *image of God*, although highly prominent in this narrative and recurring in *Gen. 5:1* and *Gen. 9:6*, has not found any echo beyond the Noah narrative in the entire Hebrew Bible—in contrast to its central meaning in Christian dogmatics (Otmar Keel/ Silvia Schroer 2002, 177–178). This calls for caution, for it could well be that Christian anthropology has interpreted things into the term that it does not contain. So, what is meant? First of all, it is striking that the biblical text says that man was created "as" the image. The "as" points to a role, a function of man in Creation. It is not an ontological statement about the nature of man, but a statement about his relationship to his fellow creatures.

In this respect, exegesis names three meanings of the concept of the image (cf. Karl Löning/ Erich Zenger 1997, 146–155 and Otmar Keel/ Silvia Schroer 2002, 178–180): Man is the image

- 1) like a statue of a god: In the ancient Orient, statues of gods were called images of the deities. The role assigned to them is intended to be a medium of divine life force for all Creation. Whoever looks at the statue and prays receives blessings and salvation.
- 2) like a king: In the ancient oriental kingdoms, kings were called images of the Godhead because, on the one hand, they were given the divine authority to rule in the name of the Godhead within their kingdom, but on the other hand, they were also charged with the duty of defending the order of life of their God, especially with regard to the weak. It is not only in the Bible that the king is committed to the ideal of a caring shepherd. And not only in Israel are there depictions that show the king as the protector of the tree of life, and thus of the divine order of Creation (cf. chapter 3.8). A king thus fulfils his role as God's image when he ensures justice in Creation. This is what is meant when *Gen. 1:26*, in the revised Einheitsübersetzung, formulates that man should "rule" over animals in their various habitats.
- 3) like a child: Some ancient oriental Creation myths tell us that man emerged from the womb of the Godhead and therefore resembles it like an image. The likeness is, as it were, the similarity of a child to its

parents. This likeness should be shown by all human beings in their actions towards Creation, according to the impulse from Gen. 1:26–27. Keel and Schroer assume that in Gen. 1 this last aspect is the most important: "The aspect of vicarious dominion is not a theme in Gen. 5:3, an association with an image of a god is not implied. Thus, one may also assume for Gen. 1:26 that with the likeness not only thoughts of representation and dominion were connected, but above all the greatest possible kinship between God and man was to be expressed." (Otmar Keel/ Silvia Schroer 2002, 180)

In continental European philosophy and theology, the image of God was translated by René Descartes (1596 La Haye en Touraine—1650 Stockholm) as "maîtres et possesseurs de la nature"—"masters and possessors of nature" (René Descartes 1637, *Discours de la méthode* VI,2). Descartes was not thinking of the ruthless exploitation of nature, but of its comprehensive mastery by human technology and science, and at least unintentionally paved the way for modern anthropocentrism. In contrast, Anglo-Saxon philosophy and theology had already begun to interpret the concept of the image of God with the concept of "stewardship" a generation after Descartes. The term was introduced into the debate on creation ethics in 1676 by Matthew Hale (1609–1676 Alderley, Gloucestershire)⁷ and in recent decades has also been discovered in continental Europe (Gotthard

7 The term stewardship itself is very familiar in the religious debates of the 17th and 18th centuries in the Anglo-Saxon language area. Matthew Hale, however, makes it the key concept in his reflections on contract theory and asks about the ethical consequences that follow from it. In his *Contemplations Moral and Divine*, Volume 1, published posthumously in 1676, he entitled an entire chapter "The Great Audit, with the Account of the Good Steward" (Matthew Hale 1676, 409–484). In it he draws on Jesus' parable of the talents (Mt. 25:14–30) and lists a total of 17 groups of entrusted gifts. Among them are, as the 6th group, the works of Creation and, as the 10th group, non-human creatures. However, while the works of Creation call primarily for wonder and greater praise of God (theocentric), non-human creatures call for stewardship, fiduciary treatment (biocentric). Thus, Hale writes: "I have esteemed them as thine in Propriety; thou hast committed unto me the use; and a subordinate Dominion over them; yet I ever esteemed myself an Accountant to Thee for them... I received and used thy creatures as committed to me under a Trust, and as a Steward and Accomptant for them; and therefore I was always careful to use them according to those Limits, and in order for those Ends, for which thou didst commit them to me." (Matthew Hale 1676, 441–443). Cruelty and mistreatment of animals, as well as intemperance and lack of compassion towards them, are a breach of God's covenant with Creation, a breach of trust and justice (Matthew Hale 1676, 445–446). The book has gone through numerous editions, and the chapter quoted here in particular has been

M. Teutsch 1985, 98). Since then, it has become established as a useful term. The term stewardship also corresponds more to the description of God's actions in the act of Creation. This is because, in contrast to the Babylonian Creation myth *Enuma elish*, which depicts the creation of the world as a divine conquest, Gen. 1 emphasises God's caring, loving relationship with his Creation (Anathea Portier-Young 2019, 45–67). Thus, it can be summarised: God-imageability means the "active responsibility of the royal human being as God's steward for the entire world of creation in the power of divine blessing" (Walter Gross 1995, 871).

Of course, there is also criticism of the concept of likeness and its transposition with "stewardship". The concept behind both is half-hearted because it still gives humans a special position (Robert Shore-Goss 2016, 14). It falls short because it separates humans from other creatures instead of connecting them (Gloria L. Schaab 2011, 59). The talk of stewardship is seductive because it views Creation as a household to be used and promotes utilitarian thinking (Gloria L. Schaab 2011, 58). It is seductive because it suggests that humans can manage and control the earth's house of life (Michael S. Northcott 1996, 129). These criticisms are certainly to be taken seriously, and I will return to them in chapter 5.1 when discussing anthropocentrism. However, it can already be said that the criticisms are only justified if the two concepts of the image of God and stewardship are taken out of their biblical context and isolated. In the overall context of Gen. 1, it is perfectly clear that the earth must not be seen primarily in terms of utility. And it is equally clear that humans have more in common with other living beings than what separates them. In this respect, it takes a very selective reading of Gen. 1 to fall prey to an anthropocentric misinterpretation.

Because it is directed against the real patriarchal environment, the strong impulse in Gen. 1 that all human beings are to rule as God's images, men as well as women, is revolutionary. Moreover, likeness is not attributed to the king alone, but to every human being. In the concept of the image, therefore, and at least in this the later Christian reception is right, the fundamental equality of all human beings is expressed. In the house of Creation, all human beings are called to shape this house with direct authority given by God, but also with indispensable responsibility to be there for the community of all living beings in a caring, life-serving and beneficial way.

reproduced in many smaller writings. So, one can hardly claim that the history of Christianity is exclusively anthropocentric.

Gen. 1:28 in the 2016 Einheitsübersetzung reads, "God blessed them, and God said to them, 'Be fruitful and multiply, fill the earth and subdue it, and have dominion over the fish of the sea, over the birds of the air, and over every living thing that creeps on the earth.'"

This is the so-called "*dominion order*", the "*dominium terrae*". While the first half of the verse with the blessing of fertility and procreation is also promised to all animals, the second part is only dedicated to humans. But what does it mean? First of all, a comparison of different translations shows that the exact choice of words is important.

- "fill the earth and subdue it to you, and have dominion over..." (according to the revised Luther Bible 2017),
- "populate the earth, subdue it to you and rule over..." (according to the 1983 Einheitsübersetzung),
- "fill the earth and subdue it and rule over..." (according to the Einheitsübersetzung of 2016) or
- "fill the earth and make it arable and rule over..." (according to Othmar Keel and Silvia Schroer 2002).

First of all, it is noticeable that the latter two translations omit the "to you". It does not appear in the Hebrew text. And of course, it makes a considerable difference whether human beings subdue the earth for themselves or for another, greater being. In the sense of the aforementioned image metaphor, it is actually clear that it can only be a matter of subduing the earth to God, i.e. of making sure that God's will is done in the whole of Creation.

Furthermore, there are two verbs in Hebrew:

- *kabash* literally means "to set foot on". It could refer to the ancient oriental ritual used when someone took over a territory or a house in fief. The moment he first set foot on it, he assumed care and responsibility for it, but of course also power. This power, when "setting foot on the earth", would then consist of keeping the life house of Creation liveable for all its inhabitants and defending it against destruction. Ancient oriental depictions show people defending their livestock against attacks from predators, placing their foot on the animal to be protected. One can interpret this as selfish, because the cow or goat is worth a lot to its owner. But one can also make the point that a living being is being protected in a caring way—at the risk of human life.
- *radah* literally means "to rule, to tread down". The subsequent enumeration of the habitats of animals indicates what is meant: Man should ensure that all living creatures get their habitat. This is often made clear in ancient oriental images of the so-called "Lord of the Beasts":

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two ibexes or ostriches or other animals fighting with each other are separated by man in order to end their competition. However, "to rule" does not mean to kill. For in the sentence that follows, humans are also only given plants for food.

Of course, even caring, just and altruistic governance remains linked to the use of force. This is no different even in a modern democratic constitutional state. Order cannot be established without violence. But violence should serve to establish justice. It must be measured against this: "The terms *kibbesch* 'to set foot on' and *radah* 'to tread down, trample underfoot, dominate' used in Gen. 1:28 denote rule that may include the use of violence... Apologetic exegesis that seeks to completely exclude the aspects of violence... and only focuses on responsibility does not contribute to processing the history of the impact of this command to rule." (Othmar Keel/ Silvia Schroer 2002, 181)



Illustration: The Lord of the Ibexes illustrates well what is meant by governing animals: scarab from Akko (Tell Fuchar) c. 1600–1500 BC (taken from: Henrike Frey-Anthes 2010, Fig. 4; cf. also Othmar Keel/ Silvia Schroer 2002, 208, fig. 161).

3.5 The Peace of Creation as a Utopian Model for Dynamising the Present

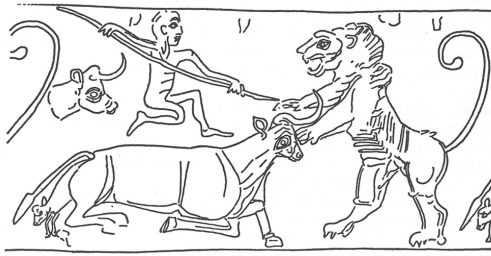


Illustration: On this Early Sumerian scroll seal from c. 3300–2900 BC, a naked man defends a calving cow against a lion while placing his foot on it (taken from: Jan Dietrich 2017, Fig. 1).



Illustration: On this Neo-Assyrian scroll seal from the 9th–7th century BC, a man presents his dominion over the earth through his stamped foot on a caprid and his simultaneous defence of a lion (taken from: Jan Dietrich 2017, Fig. 9). Keel and Schroer comment on the illustration thus: "Having under foot' or 'treading' does not necessarily mean brutal, certainly not arbitrary submission, but can also imply the protection of the weaker from the stronger." (Othmar Keel/ Silvia Schroer 2002, 181, Fig. 144)

The narrative ends in *Gen. 1:29–2:3* with the vision of cosmic peace (Karl Löning/ Erich Zenger 1997, 155–162). With a so-called *formula of transfer*, God, like a lord to his vassals, gives all living beings the earth as a house and the plants as food. Every living being has its place and its food. In this context, the vegetarian nourishment of all living beings is a sign of the fullness of life: "That the most precious good in the house of life of creation is the happy life of all living beings unfolds [in] *Gen. 1:29f* with an image of peace that we must meditate on and concretise especially today as a paradigm critical of progress [...] The central point of this utopia is a coexistence of all living beings without violence." (Erich Zenger 1989, 142)

3.6 *The guiding principle of the peace of Creation and the norms of Creation justice*

Now the question inevitably arises as to how the utopian narratives of Gen. 1–2 relate to the chapters of Gen. 3 and Gen. 6–9, which are characterised by transgressions and violence. Classically, the texts have been interpreted in succession: First everything was peaceful, then came sin and finally God's attempt to give his Creation the prospect of survival under the conditions of sin. With such an interpretation, however, the mythical character of the texts is not taken seriously. It is not about something that was, but about what is and what is to be. This is a systematic theological question, not a historical one.

What is a situation of competition for scarce resources, a struggle for survival that inevitably requires violence? No living being can live without affecting other living beings, without restricting their habitat and their claim to resources. One can now call every claim to living space and resources, i.e. also stepping on grass or eating a head of lettuce, a sin. But in doing so, one would forfeit the distinction between avoidable, ergo sinful, and unavoidable, ergo non-sinful, violence. The classical Christian theory of justice, however, assumes that this distinction exists. Violence must justify itself, but sometimes it can. This very idea is reflected in the Noahide covenant and its commandments: Violence is to be limited to the necessary minimum—it cannot be completely avoided.

But why then are visions of completely non-violent coexistence of creatures prefixed to the Noahide covenant in the Bible? Beyond realistic norms of justice, man needs a vision of the fullness of life, which has a double meaning for him:

- Through its *cognitive component*, a vision functions as a guiding principle according to which people *orient* their lives and towards which they can shape their everyday lives. The value horizon of a person or a society is stored in this mission statement: everything that makes his or her life worth living. Of course, it is part of the character of a vision or utopia that it is unrealisable in this life and can only be approximately realised. But without it, life would be aimless and disoriented. The prevailing idea of justice would become harsh, merciless and rigid and thus ultimately unjust.
- Through its *emotional component*, i.e. above all through its vividness, a vision functions as a motor that *motivates* further ethical development and as a corrective that *criticises* the current ethical standard as insufficient. For it is not satisfied with it but drives its dynamic further

development and reminds us that there are more ways to do good than those that are already being realised.

It is precisely this dual function that the *vision of the peace of Creation*, illustrated twice in Gen. 1–2, takes on vis-à-vis the ideas of the justice of Creation in Gen. 9 and in the further course of the Bible. It is one of the greatest and most significant biblical utopias and dreams of all creatures living together in a healthy community of justice and peace. It symbolically shows "that the most precious good in the house of life of creation is the happy life of all living beings" (Erich Zenger 1989, 142).

In the Old Testament, this vision is not only found in Gen. 1–2, but also in a number of prophetic texts: Hos. 2:20–21; Is. 32:15–20; 65:25; Ez. 34:25–30 and especially Is. 11:1–9. In this last, extraordinarily well-known text, we are told: At his coming the Messiah will establish justice and righteousness, and there will be peace in his kingdom, not only for the people of Israel but for all Creation. Wolf and lamb, panther and little goat, calf and lion, cow and she-bear, adder and human child will dwell together in peace and make friends. Isaiah's narrative always contrasts a wild animal with a domestic animal or man—again, the criterion for differentiation is the proximity or distance to man. According to Isaiah, messianic peace begins in an exemplary way on Zion and radiates from there into all the world.

In the New Testament, the vision of the peace of Creation is taken up three times: In the prologue to Mark's Gospel Mk. 1:1–15, it is alluded to with an inconspicuous but significant half-sentence: When Jesus retires to the desert for forty days after his baptism in the Jordan, Mark 1:13 says: "He lived with the wild beasts". Even though the other evangelists deleted this reference, it is highly programmatic for Mark: in Christ, the new Adam, the messianic age dawns (Joachim Gnilka 1978, 57–58). In him, the peace of Creation, for which everyone longs, is beginning to become reality. He "is the royal lord of the animals" (Karl Löning/ Erich Zenger 1997, 74) and deals justly and mindfully with all creation. Thus, Christ is the archetype of the image of God. Furthermore, Mark establishes a connection to Jesus' message of the Kingdom of God, which appears directly afterwards in Mk. 1:14–15: When Jesus announces directly after his peaceful coexistence with the animals that the reign of God is near, then this cannot be understood in any other way than as a peaceful community of all living beings. As early as in the prologue, Mark announces Jesus as the bringer of salvation for all Creation.

The two other New Testament texts are found in the epistolary literature. In Rom. 8:18–30, Paul first describes the groaning of the whole

Creation, which is just as subject to "nothingness" (mortality) as man. But then Paul testifies to the firm hope: "it too, the creation (κτίσις), shall be delivered from the bondage of corruption to the freedom and glory of the children of God." (Rom. 8:21). "In the past, there has been intense debate about who or what Paul means here by κτίσις. In the meantime, however, a certain consensus has emerged, according to which the extra-human nature and creature are spoken of here." (Michael Wolter 2014, 509). Through the different attributes he assigns to human beings on the one hand and to the non-human Creation on the other, Paul does reveal that he thinks anthropocentrically, in line with the Stoa, and does not assign an inherent worth to creation like Gen. 1–2 (Michael Wolter 2014, 514). Nevertheless, for the sake of human beings, he assumes that non-human creatures are also liberated from death and transience because human beings are "permanently dependent on the renewed creation and cannot exist without it" (Michael Wolter 2014, 514). To put it bluntly: heaven would not be heaven for humans without plants and animals, but hell. Therefore, Paul gathers the entire range of non-human creatures under the cross of Christ: in suffering, but also in hope.

A final allusion to the vision of the peace of Creation is found in Col. 1:15–20. There it says, among other things: "... all things were created through him and to him. He is before all creation, and in him all things endure. [...] For God willed to dwell in him with all his fullness, to reconcile all things through him to him. He wanted to bring everything in heaven and on earth to Christ, who made peace on the cross through his blood". The peace of Christ is understood here in the clearest possible cosmic terms: Everything created is included in this peace.

Even more remotely connected to the vision of the peace of Creation, but tremendously powerful in its own right, is the Logos hymn at the beginning of John's Gospel (Jn. 1:1–18). The parallels to Gen. 1 are obvious: both texts begin with "In the beginning". In both, the semantic fields "word"/"speak" and "become"/"create" play a central role. At the centre of Jn. 1:1–18 is the Logos, who is before all Creation and uncreated because he is God. "All things came into being through the Word, and without it nothing came into being that has come into being." (Jn. 1:3). Of this Word it says in verse 14: "And the Word became flesh and dwelt among us, and we beheld his glory, the glory of the only Son from the Father, full of grace and truth." For many centuries this sentence has been interpreted as the "hominization (becoming human) of God". This is not wrong, and yet it is only half the truth, for: "The absolute *σάρξ* is not paraphrase for 'man' [...], but [...] expression for the earthly-bound (3, 6),

the perishable (6, 63) [...] in the incarnate Logos heaven descends to earth." (Rudolf Schnackenburg 1981, 243). "Flesh" throughout the Old Testament always means the creaturely or also the creatures in their entirety. With the incarnation of the divine Word, therefore, the whole Creation becomes the body of God (hence the book title by Sallie McFague 1993). The Word made flesh is "the body of the universe" (Sallie McFague 1993, 131) and incarnation the "creaturehood of God" (Michael Rosenberger 2001a, 20–21). "For Christians, all the creatures of the material universe find their true meaning in the incarnate Word, for the Son of God has incorporated in his person part of the material world, planting in it a seed of definitive transformation." (LS 235). The popular custom of also placing animals at the manger of the Christ Child is a symbolic expression of this truth of faith: the light of the Child of Bethlehem illuminates all Creation (cf. chapter 4.4).

The utopia of the peace of Creation is one, but not the only biblical utopia. Next to it are the utopia of the satiation of all people and the vision of the pilgrimage of all peoples to Zion. While the latter refers to interpersonal peace that transcends all boundaries of nations and religions, and the middle one describes an ideal state of interpersonal justice, the vision of the peace of Creation addresses the greatest reach of divine power. It also extends to non-human living beings: God's faithfulness is to all that he has created. The two visions of the satiation of all and the pilgrimage of peoples could be understood anthropocentrically in themselves. Non-human creatures do not appear in them. The biblical vision of the peace of Creation can theoretically also be understood anthropocentrically, as Paul demonstrates in Rom. 8. Its dynamic, however, is towards a biocentrist view of the world, and in most biblical testimonies it is understood in exactly this way. All creatures are covenant members of God—all are therefore due justice for their own sake. We would think God too small if we imagined that he had created the non-human creation only as a backdrop or resource.

Table: The three great utopias of the Bible:

Justice	Saturation of all (Is. 55:1–2; Mk. 6:30–44 et al.)
Peace	Pilgrimage of the nations to Zion (Is. 2:1–5; Mic. 4:1–5; Rev. 21:24)
Integrity of Creation	Peace of Creation (Gen. 1–2; Is. 11:1–9; Mk. 1:13, etc.)

In church preaching and in the history of theology, the biblically so significant vision of the peace of Creation has largely been passed over. There were certainly several reasons for this: On the one hand, the classification of Greek philosophy that animals are irrational beings (*ἄλογα*) and as such not capable of redemption prevailed early on. On the other hand, the early church fathers were quickly dominated by the allegorical interpretation of the biblical texts, which looked for the figurative meaning of the texts and tended to disregard their literal meaning. In the piety of believers, on the other hand, the vision of animal peace has always played an enormous role throughout the centuries. It is reflected in countless legends of saints living in a good relationship with animals (Joseph Bernhart 1997³ lists well over 50 saints); in numerous pictorial representations, first and foremost in the depiction of an ox and donkey at the manger, which, unlike the Christmas story Lk. 2:1–14, identifies two animals as the first witnesses to the Saviour's birth and as his closest relatives in Creation (cf. chapter 4.4); and finally in many rituals in dealing with Creation (cf. chapter 4).

In his encyclical *Laudato si'*, Pope Francis listened to this sense of faith (*sensus fidei*) of Christians and recalled the image of an eternity populated by all creatures. "All creatures are moving forward with us and through us towards a common point of arrival, which is God, in that transcendent fullness where the risen Christ embraces and illumines all things. Human beings... are called to lead all creatures back to their Creator." (LS 83). "In union with all creatures, we journey through this land seeking God." (LS 244). "Eternal life will be a shared experience of awe, in which each creature, resplendently transfigured, will take its rightful place and have something to give those poor men and women who will have been liberated once and for all." (LS 243)

"Theologically, each creature in the web of life is a symbol of presence; each is intrinsically good, embraced by God and called into redemptive future. In Christ, God entered evolving creation in a profoundly new way: the Incarnate One, Word-become-flesh, became an earth creature, sharing biological life with others on this planet. The risen Christ has assumed a cosmic role, leading creation back into God in a great act of love and thanksgiving that will be realized in its fullness in the great eschaton." (Mary E. McGann 2012, 49)

3.7 *The Sabbath as the Basic Principle of Creation Justice*

In the logic of Gen. 1:1–2:3, the Sabbath is a real symbol of and model for the peace of Creation that is already dawning. It gives all creatures a foretaste of the fullness of salvation. In the logic of the seven-day work, the Sabbath and not man is the "crown of Creation". For the crowning climax and conclusion of the narrative is not the sixth, but the seventh day. Only with it does everything come to completion. And it absolutely has to be the seventh day. That is why the total of eight works are distributed over only six days. God has to work overtime twice, as it were: On the third and sixth day, two works each are necessary so that he can complete his work of Creation in time for the Sabbath. As before, God also blesses the Sabbath (Gen. 2:3) and thus brings about the "continuing, life-promoting validity of this order" (Bernd Janowski 1990, 59).

The Sabbath commandment is one of the pillars of the biblical ethos. It is inculcated five times in the Torah (Ex. 20:8–11; 23:12; 34:21; 35:1–3; Dt. 5:12–15). Its frequent repetition and classification among the Ten Commandments show how important, but also how controversial and disregarded it must have been: The strict prohibition of work on the seventh day was already a severe restriction from an economic point of view.

The *subjects of the right to Sabbath rest* are enumerated individually except in the oldest formulation Ex. 34:21 and the very general text Ex. 35:1–3: the free landowner, his sons and daughters, his slaves, his livestock (cattle and donkeys) and the strangers (asylum seekers, refugees, guest workers) in his village. Mentioning them in this order again shows the closeness of the family to the patriarch: his children are closer to him than his slaves and they are closer to him than his work animals. The foreigners, who do not belong to his household permanently but only work for him as day labourers (today we would say freelancers), come at the very end. Nevertheless, they are all entitled to the weekly day of rest—on this day, everyone is equal. It is precisely the underprivileged and socially weak who must be protected from excessive or immoderate economic exploitation, so that they can really experience the last and deepest freedom from the pressure to perform and from being put to work. Thus, the Sabbath places a clear limit on (agricultural) economic dynamics: six days of work—one day of rest. At the same time, the commandment crosses the boundary of interpersonal relationships: Solidarity and justice apply to all living beings on this earth, including animals.

The very different *justifications* for the commandment in the individual texts are interesting: In the Book of Deuteronomy, keeping the Sabbath

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is above all a sign of *gratitude* for Israel's liberation from slavery in Egypt (Dt. 5:15). Those who "themselves" once had to suffer under the burden of drudgery (meaning the corporate self of the people of Israel) will, in memory of this, gladly and voluntarily grant a day of rest to those who currently occupy an underprivileged position. Thus, a *social attitude* grows directly out of gratitude. Ex. 20:11 refers to the Creation narrative of Gen. 1:1—2:3: "For in six days the LORD made the heavens and the earth and the sea, and all that pertains to them; and on the seventh day he rested. Therefore the LORD blessed the Sabbath and sanctified it." Thus, the Sabbath rest is justified *theologically in terms of Creation*: God put the rhythm of work and rest into his Creation. The ultimate purpose of his work of Creation is not work and the struggle for survival, but the opportunity for all living beings to "catch their breath" (Ex. 23:12). A good and fulfilled life and the joy of it are the real meaning and purpose of the day of rest. The *cultic significance* of the Sabbath is only in third place, which has been attested to in Israel since the early royal period. Just as the Sabbath is the culmination of the work of Creation, so the encounter of the wandering people of God with God in the tent of the covenant is the climax of their deliverance from Egypt. Just as the creation of the world is the condition for the possibility that God and Creation can encounter each other, this encounter with God is the inner goal of the process of Creation. On the seventh day, all living beings can and should each in their own way encounter and "praise" the one who created them (Bernd Janowski 1990).

The Sabbath commandment impressively shows that the Torah always has all creatures in mind. Environmental protection and animal welfare are integral parts of the divine instructions for God's people. Thus, the commandment of Sabbath rest is the primordial norm of Creation justice.

3.8 The tree of life as an archetypal symbol of Creation justice

The tree of life is a symbol that is at least 5000 years old in the cultures of the ancient Orient. In recent decades, numerous images have been found during excavations that allow us to understand better what was meant by it. Images of the Tree of Life can be found on stone reliefs, scarabs (pendants worn around the neck), clay vessels and scroll seals (clay cylinders in relief that were rolled over wet clay tablets where they created a negative relief) throughout the Near and Middle East. Despite the diversity of cultures and religions, it is a symbol that can be easily understood (cf. on the following mainly Othmar Keel/Silvia Schroer 2002, 62–64).

- In the earliest period that can be identified (3rd–2nd millennium BC), it is primarily a symbol of female deities and thus stands for *fertility and vitality*, which is requested *as a divine gift*. Either the tree is depicted as an attribute of the goddess, who stands next to the tree, or it stands alone and is a representative symbol of the goddess' power and her blessing. Still in Gen. 2:9, the tree of life is symbolic of the animating power of God, who, however, is no longer understood as feminine, but asexual.
- In the 1st millennium BC, the symbolism shifts. The tree now stands for the king who guarantees the *order* that makes it possible for life to be passed on. This is the case, for example, in Ez. 31:3–9: "A cedar on Lebanon, splendid was its branch, abundant its shade, tall its growth, and in the clouds its top rose. Water made it tall. The flood in the deep made it grow high. Its streams flowed all around the place where it was planted, it directed its channels to all the trees of the field. Therefore it grew taller than all the trees of the field. Its branches became very numerous and its boughs spread out because of the abundance of water as it grew up. All the birds of the sky had their nests in its branches. All the wild animals gave birth to their young under its branches. All the many nations dwelt in her shade. She was beautiful in her greatness with her broad branches; for her roots had much water. No cedar in the garden of God was comparable to it. No cypress had branches like it, no sycamore as mighty as it. None of the trees in the garden of God resembled her in beauty. I had made her magnificent with her numerous branches. Full of jealousy for her were all the trees of Eden in the garden of God."—If the tree is associated with the king, then it stands, above all, for the king's task of protecting life in his sphere of power and ensuring an order that is just to all creatures. It is no longer the divine gift but the *human task* that receives priority attention. It is precisely this task that Gen. 1:26–27 transfers from a single king to all men and women with the Godlike image of man. To figuratively represent the importance of ordering, the tree is always a strictly pruned and symmetrical looking, cultivated tree and never a wild growing plant as in other iconographic contexts. In several depictions, the king has to defend the tree against attacks by a monster symbolising the powers of chaos. This corresponds entirely to the ordering of the original "tohuwabohu" in Gen. 1 and the creation of a watered garden in the middle of the desert in Gen. 2. The tree of life is the divine, life-enabling order of Creation. That is why it stands in the middle of

3. Building an Ark. Impulses from biblical creation texts

the garden in Gen. 2, from which four rivers flow in four directions. But it remains vulnerable and must always be protected.

- This order gives all living beings their space in the great house of life of the world. So, the tree also stands for *living spaces*, as in Ez. 31. Land animals gather under its protective roof, birds seek rest in the branches and peck from the fruits of the tree, people stand under it and worship the deity. Everyone has their place, there is room for everyone.

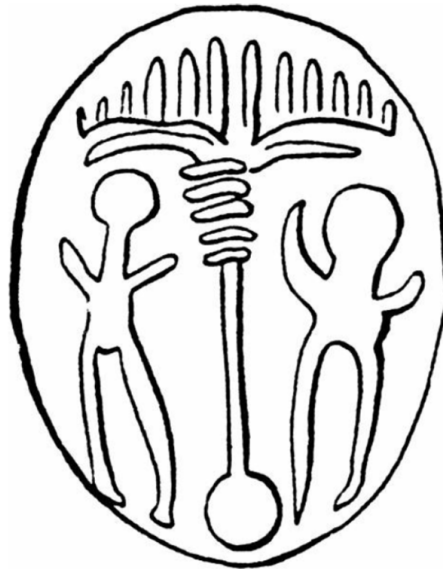


Figure: Scaraboid from Palestine, 9th–7th century BC: Man and woman with raised hands under a tree (taken from: Urs Winter 1986, Fig. 5).

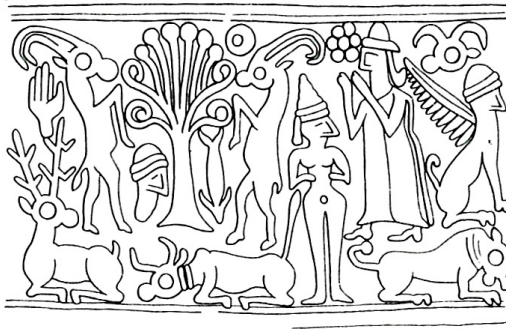


Illustration: Scroll seal from Megiddo, 14th century BC: Naked goddess beside a tree flanked by caprids. Amidst stag, ox and lion, the goddess appears not only as the giver and protector of the tree, but also as the "mistress of the animals" (taken from: Andreas Michel 2015, Fig. 2; cf. also Othmar Keel/ Silvia Schroer 2002, 60, Fig. 30).

In the wisdom texts of the Old Testament (Prov. 11:30; 13:12; 15:4), basic ethical attitudes are compared to the tree of life. Even wisdom itself, which is "closely related to the [...] idea of the right order of life" (Urs Winter 1986, 174), is referred to as the tree of life (Prov. 3:18). Finally, the Revelation of John promises that the righteous in the heavenly Jerusalem will enjoy the fruits of the tree of life (Rev. 2:7; 22:14, 19).

Christian art and literature take up the tree of life motif very early and associate it with the *cross of Christ*. The tree of life in the Garden of Paradise is

- a *reference* to the Crucified in *Justin's* dialogue with the Jew Tryphon (mid-2nd century): "To him who was crucified to come again in glory, as the Scriptures show, the wood of life mysteriously pointed, which, it is recorded, was planted in Paradise..." (Justin, Dialogue with Tryphon 86).
- the *model* of the cross of Christ in the apocryphal text of the so-called *Syrian Treasure Cave* (ca. 6th century): "True is the word and truth-proclaiming: this tree of life in the middle of paradise is a model for the redemption cross, the (actual) tree of life, and this was erected in the middle of the earth". (Carl Bezold 1883, 5–6). Hour by hour, the text parallels the Fall of the first human couple and the crucifixion of Christ, both of which he is convinced took place on a Friday: "In the sixth hour Eve ascended the tree of the transgression of the commandments; and in the sixth hour the Messiah ascended the cross, the tree of life. In the sixth hour Eve gave to Adam the fruit of the bitterness

of death; and in the sixth hour the unrighteous congregation gave to Messiah vinegar and gall. Three hours was Adam bare of his shame under the tree; and three hours was the Messiah naked on the trunk of the cross." (Carl Bezold 1883, 62)

- the *cross of Christ itself* in the hymn "pange lingua" by *Venantius Fortunatus* (around 570): see the text at the end of this sub-chapter.
- the *biological "father"* of the tree from which the cross of Christ is made, in the *Legenda aurea of Jacobus de Voragine* (second half of the 13th century): It refers to a Greek story in which Seth is supposed to bring his terminally ill father Adam oil from the "tree of mercy" in paradise. At the entrance to Paradise, an angel gives him a branch from the tree and predicts that Adam will get well if the branch bears fruit. Adam dies and Seth plants the branch on his grave. There, King Solomon later finds it to be a large, beautiful tree. He has it cut down and uses it for a footbridge over a lake. But the Queen of Sheba recognises that it is made of special wood and does not walk over it. She tells Solomon that there will be one hanging from the wood whose death will bring disaster to the Jews. Solomon then buries the wood. Later, the Pool of Bethesda is built over the spot, the water from which has healing properties (Jn. 5)—because of the wood lying in it. Shortly before the crucifixion of Christ, the wood floats to the top and is used for the cross of Christ. (*Legenda aurea on the Feast of the Finding of the Cross*)

As early as the late 4th century, there are numerous depictions of the cross of Christ as a tree of life, especially on sarcophagi, but also in mosaics. Rich, mostly stylised tendrils sprout from the wood of the cross and take on oversized, "cosmic" proportions. Animals and people are often depicted in them—probably most richly in the apsis mosaic of San Clemente in Rome, which in its present version dates back to 1100, but iconographically is largely based on the mosaic of the predecessor church from the 4th century: Birds nest in the tree of life and feed their young; land animals find shade and food; water animals frolic in the four rivers of paradise; and humans are peacefully united with them. In this way, the ancient oriental and Old Testament concept of the tree of life experiences Christological deepening: Christ is the founder of the peace of Creation symbolised in the tree of life, the archetype of the steward who orders the house of life of Creation according to God's will and frees human beings to do the same. Christ suffered for all creatures, and through him all are liberated to new life.

What first appears in the visual arts is condensed textually in the 8th and 9th stanzas of the hymn "Pange lingua" by Venantius Fortunatus around 570. In Latin, the two stanzas, written in trochaic tetrameter, read like this:

"Crux fidelis, inter omnes arbor una nobilis,
Nulla talem silva profert flore, fronde, germine,
Dulce lignum dulce clavo dulce pondus sustinens.

Flecte ramos, arbor alta, tensa laxa viscera,
Et rigor lentescat ille, quem dedit nativitas,
Ut superni membra regis mite tendas stipite. "

The current Book of Hours of the Catholic Church also translates these stanzas in the rhythm of the trochaic tetrameter for the Lauds of Holy Week thus:

"Faithful Cross! above all other, one and only noble Tree!
None in foliage, none in blossom, none in fruit thy peers may be;
sweetest wood and sweetest iron! Sweetest Weight is hung on thee!

Bend thy boughs, O tree of glory! Thy relaxing sinews bend;
for awhile the ancient rigor that thy birth bestowed, suspend;
and the King of heavenly beauty gently on thine arms extend."

What it means in terms of content that the cross of Christ is the tree of life for all Creation is not unfolded in Venantius Fortunatus. It is clear enough for those participating in the liturgy. Today, on the other hand, we need to open up the tree of life motif anew. It is one of the most telling pieces of proof that the biblical vision of the peace of Creation has always remained alive through 2000 years of Christianity. And that alongside the anthropocentric misinterpretation of the image of God and the mandate to govern in Gen. 1:26–28, there has very much always been a pro-creation current in Christian spirituality. In this respect, Elizabeth Johnson (2018, 192) rightly asks what it would mean for the Church's self-understanding if it were to open itself in its full breadth to belief in the redemption of all Creation. The Tree of Life Cross proclaims unequivocally: the Crucified One is in solidarity with all tortured creatures and opens the door to life for them. For the Creator loves all his creatures—and his faithfulness extends to them all beyond death.

4. Celebrating Creation. Liturgical expressions of care for Creation

With the Tree of Life, we have crossed the threshold from word to image, from text to symbol. And it may have already been felt that symbols are often more powerful than language. Symbols and, in an analogous way, rituals are denser than words, both cognitively and emotionally—even if they are "wordy". A single symbol can say much more than an elaborate treatise of language, and it can move people much more intensely. However, symbols and rituals are more ambiguous and in need of interpretation than words. They often need the explanatory word in order not to be misunderstood.

In Christianity, we call the complex structural whole of symbols, rituals and interpretive words liturgy. This is not only an expression of the Christian faith, but also one of its sources of knowledge—in technical language a "theological place" (*locus theologicus*). However, the *locus theologicus* liturgy differs in some respects from the *locus theologicus* Bible. Whereas the Bible was completed at the end of the founding phase of Christianity and has been handed down unchanged ever since, the liturgy we know today was largely formed after the founding phase and—despite all its persistent forces—has been constantly developed over the centuries. The Bible thus ensures Christianity's fidelity to its origins—hence, liturgy must be constantly measured against the Bible (Tabita Landová 2019, 29–30). At the same time, liturgy can make much more direct references to the challenges of the present, the "signs of the times" (GS 4) than the Bible alone, and ideally embodies a symbolic ritual transposition of biblical texts into people's present lives.

This bridging function that the liturgy assumes between the Bible and contemporary society is highly demanding and does not always succeed. Refractions in the course of Church history must be reckoned with. One such break was the penetration of Greek philosophy into early Christian theology. The first traces of this process can already be seen in biblical writings, for example in the (late) wisdom writings of the Old Testament, in the wisdom echoes of Jesus' teachings and in Paul's adoption of Stoic ideas. But Greek philosophy only developed its full force in its reception by the Church Fathers of the 3rd to 5th centuries. This force is so strong that it erases biblical basic options where they oppose the basic options

of Greek philosophy. With regard to the ethics of Creation, this concerns, above all, the replacement of biblical biocentrism with Greco-Roman anthropocentrism. In the liturgy of the Church, this paradigm shift is still reflected today, but, as we will see, it has gradually been relativised again in recent decades.

In addition, there is a second refraction of the locus theologicus of liturgy: even if liturgy in principle has the potential and the task of taking up the "signs of the times" and interpreting them symbolically and ritually in the light of the Gospel, as a ritual it has an enormous capacity to persist (Tabita Landová 2019, 27–28). Rituals that have been practised for centuries are difficult to change over long periods of time. On the one hand, this is good because rituals ensure diachronic continuity. They are tradition in the best sense of the word. On the other hand, rituals thus run the risk of missing the connection to the present. And we will also see this in the following: While the environmental movement as well as the environmental sciences have vehemently rejected anthropocentrism since the middle of the 20th century and regard it as one of the greatest stumbling blocks on the path to ecological responsibility, the liturgy of the Church partly continues to persist with this unbiblical paradigm adopted from Greek philosophy.

The following reflections will therefore have to make the limits and possibilities of Christian liturgy equally clear. For, on the one hand, "Lex orandi est lex bene operandi" (Tabita Landová 2019, 16; quoted by Paul Ramsey 1979) is true—the law of prayer (and celebration) is the law of good action. But this equation is not a one-way street. It also means that the morality of Christians and even of all people of good will (!) is a locus theologicus for liturgy (and liturgical science) (Ralph N. McMichael 1993, 146; Tabita Landová 2019, 17).

Rituals manifest and construct a particular world view (Tabita Landová 2019, 21). The world view or perspective of Christian liturgy is that of the dawning kingdom of God (Tabita Landová 2019, 20). However, due to historical refractions, liturgy can sometimes lose sight of this perspective and construct a false world view, for example "when we acclaim the human being as the crown of creation and knowingly ignore the human destruction of the environment and its cruelty to animals" (Tabita Landová 2019, 24). Liturgy (and liturgical science) must therefore always strive for openness to other world views and allow itself to be critically questioned by them (Tabita Landová 2019, 23).

Against the background of the doctrine of the *sensus fidei* or *sensus fidelium*, the sense of faith of all the baptised (cf. LG 12), a broadening

of the concept of liturgy is necessary. Liturgy in the broad sense means not only the officially performed rituals and celebrations of the Church, i.e. liturgy in the narrower sense, but also includes the symbolic ritual practices of "popular piety" (cf. International Commission of Theologians 2014, nos. 82–83; 87; 106–112). These also provide information about the Christian perception of care for Creation. And as will be seen, popular piety has remained closer to biblical biocentrism for long stretches than official liturgy. It is not surprising that Pope Francis, who is as deeply rooted in popular piety as John XXIII and who refers to a saint who was not a theologian but also a person of popular piety, namely Francis of Assisi, should write the first encyclical on the Christian contribution to environmental responsibility.

So, what are the already realised and still possible impulses from the Christian liturgy for contemporary ethics of Creation? What can the Christian liturgy tell us about the perception of Creation, and where does it reach its limits in its present form, with the result that it would have to turn to the school of thought of the environmental movement itself?

4.1 "All like the altar vessels". Creation spirituality in the liturgical stance

Before looking at individual liturgical processes in the following sections, we should first address a central attitude of the liturgy itself: reverence (cf. in detail chapter 9.3). Liturgical action or speech will only be coherent and credible if it expresses the attitude of stepping back in front of the ever-greater God and his astonishing Creation. In the secular language of modernity, we speak less of reverence than of respect or esteem. What is meant, however, is ultimately the same thing: reverence or respect recognises the other as independent and ultimately unavailable. It gives the other person space and does not appropriate him or her for its own purposes. The English word "worship" is etymologically derived from the Middle English "worth-ship", appreciation (Benjamin M. Stewart 2011, 9–10; Barendt J. de Klerk 2014, 2). What one does not value, one has no respect for.

Reverence is manifested and concretised in the liturgy in the posture of the body, in someone's way of speaking and the manner of their silence, in the handling of liturgical devices and signs, in the forms of expression in approaching fellow celebrators. In the best case, reverence is permanently perceptible during liturgical celebration. In advance of the concrete

4.2 "Embracing the world". Creation spirituality in sacraments and sacramentals

content of a celebration, a sign or a prayer, liturgy is the expression and performance of reverence.

This is, at the same time, the fundamental attitude of Creation spirituality. Whoever recognises God as the Creator and the world as his Creation will immediately step back in mute amazement, take himself back. In an unsurpassable way, the Rule of Benedict formulates the instruction to the cellarer, that is, the monastery's economist: "All the utensils and all the possessions of the monastery he shall regard like the sacred vessels of the altar." (RB 31,10) With these words Benedict brings an ancient monastic tradition into a tremendously dense formula: Reverence is the central attitude not only of the liturgy but also towards all created things. Creation is not a mass at man's disposal, it is not absorbed in its usefulness for him, but is good and valuable independently of him and ultimately always holds a mystery. This is why the spiritual person will adopt an attitude of reverence towards all created things (cf. Michael Rosenberger 2001a, 26–28). Christian liturgy and ecology are "natural partners" (Benjamin M. Stewart 2011, 11).

4.2 "Embracing the world". Creation spirituality in sacraments and sacramentals

Most post-conciliar treatises on sacramental theology derive the sacraments primarily from the sacramentality of the Church. In this way, they follow the Second Vatican Council, which stated: "The Church in Christ is, as it were, the sacrament, that is, the sign and instrument of the most intimate union with God as well as of the unity of the whole human race." (LG 1) Theologically, this statement was a great step forward—and yet it does not go far enough, for the primordial sacrament in which God communicates himself to the world is this created world itself (Kevin W. Irwin 2019, 267–284). It is therefore logical that Pope Francis, in his encyclical *Laudato si'*, already focuses on the sacramentality of Creation in the prologue. He draws on a statement by Patriarch Bartholomew I of Constantinople when he writes: "As Christians, we are also called 'to accept the world as a sacrament of communion, as a way of sharing with God and our neighbours on a global scale. It is our humble conviction that the divine and the human meet in the slightest detail in the seamless garment of God's creation, in the last speck of dust of our planet.'" (LS 9; quoted from Patriarch Bartholomew I, Address at Halki Summit I, Global Responsibility and Ecological Sustainability: Closing Remarks, Istanbul, 20 June 2012).

The "seamless garment" of the earth alludes to the Passion of John, which, unlike the other Gospels, emphasises that Jesus' undergarment was seamless (Jn. 19:23). When Bartholomew and Francis speak of the "seamless garment of the earth", they connect the garment of Creation with the garment of Jesus and the destruction of Creation with his crucifixion⁸. At the same time, they postulate that nothing can be taken away or cut off from this garment—it is an indissoluble unity in which even "the tiniest speck of dust" has an irreplaceable significance. Those who advocate the anthropocentric thesis that only humanity is destined for redemption and perfection tear apart the "seamless garment of God's Creation".

Francis interprets the sacraments in cosmic breadth. Nothing in Creation is excluded from it: "The Sacraments are a privileged way in which nature is taken up by God to become a means of mediating supernatural life. Through our worship of God, we are invited to embrace the world on a different plane." (LS 235). With this expansion of the classical doctrine of the sacraments, Francis takes up an ancient tradition anew: "ancient sacramental cosmology [...] perceived the entire cosmic community of living beings as grounded in divine life, guided by divine wisdom, redeemed by Christ, and intrinsically related by design." (Mary E. McGann 2012, 57)

In this way, the sacraments not only say something about the spiritual dimension, but also about the material dimension of our relationship with God. Those who use water for baptism also take into account the preciousness of water and its endangerment through pollution or overuse. Those who use bread and wine for the Eucharist must inevitably also ask how these gifts were produced and what ecological effects their cultivation had. Those who have understood Creation as a primordial sacrament must pay the utmost attention to the materiality of the gifts. The rubrics of liturgical books have always done this. But they would need updating in times of a largely industrialised, environmentally destructive (land) economy. And they would have to be heeded better by liturgists, for: "How [...] can we presume to immerse the elect in the baptismal bath, anoint them with consecrated oil, or invite them to the table of the Eucharist, without recognising that the natural signs we use can also speak of the poisoning of the natural world?" (Peter McGrail 2016, 56)

8 This idea is already represented artistically in the X. Station of the Way of the Cross by the Argentinean artist Adolfo Perez Esquivel (Nobel Peace Prize winner 1980) from 1992. Jesus is robbed of his clothes in the middle of a deforested rainforest—the parallel to the Earth, which is robbed of its clothes, is obvious.

4.2.1 Baptism as a sign of the great flood

Baptism brings man's creatureliness into play in several ways. In the immersion of the baptised—the original baptismal ritual, which has largely withered away in the Western Church—the death of the human being is also thematised. At the beginning of his life of faith, man remembers his mortality and transience, which is not abolished by baptism. However, it is given a new interpretation: by dying with Christ (Rom. 6:3–11), Christians have the hope of rising with him. Because the "sting" of death thus loses its power, believers can be "dead to sin", as Paul puts it, and live from the loving care of their Creator. This is why the first form of baptismal water consecration says: "In the waters of the flood you modelled our baptism, as it destroys the old man to awaken new life". This alludes to the destructive power of the great flood at the time of Noah. Unfortunately, however, there is no mention of the fact that this destructive energy of water threatened the very existence of all creatures. Here, one could easily build a bridge to the responsibility of the baptised for all living creatures on earth. This is exactly what happens in a liturgical book for the Evangelical Lutheran Churches in Germany, which was published for trial in 2018 (UEK/ VELKD 2018). There, for the time during which water is poured into the baptismal font, a form of "contemplation" is provided which interprets Martin Luther's famous "Flood Prayer" in a contemporary and true-to-life way. This reflection says: "The water with which we baptise is reminiscent of the floods of water that the Bible tells us about—waters of death and of life: of the Flood in which the world perished—but God preserved Noah and his own together with the animals in the ark." (UEK/ VELKD 2018, 49.63.76)

The water of baptism is a metaphor "of our indissoluble marriage to the Earth, our original existential condition of being-in-the-world". (Mary E. McGann 2012, 356, citing Louis-Marie Chauvet 1995). Every human being is part of this earth and indissolubly woven into its seamless mantle. This profoundly earthly existence is deepened and strengthened in baptism because Christ himself has become part of Creation (Mary E. McGann 2012, 342). The human being is woven even more firmly into this web of Creation through baptism into Christ (Mary E. McGann 2012, 343). Unfortunately, this third aspect (alongside that of sonship to God and church membership) is usually forgotten. It is also absent from official texts, except for the reference to the Flood.

As already mentioned in the introduction, the materiality of the sacraments is of great importance. The instructions for the baptismal rite take

this into account in a differentiated way. There it says in No. 48: "The baptismal water should be ordinary and pure water". So simply water should be used, without any additives, but water of good quality that does not contain any harmful substances. In No. 50 it is added: "The baptismal fountain can be set up in such a way that the water can flow into the basin and out of it. Such an arrangement is recommended because flowing water is a clearer sign of life" (The Celebration of Infant Baptism, 1971). This recommendation, which unfortunately is only realised in a few Churches, can only be underlined from the point of view of Creation spirituality. Baptism in fresh, running water would be highly appropriate and much closer to Creation (Mary E. McGann 2012, 344; cf. Lisa E. Dahill 2016, 182–185). Preferably even in the "wilderness", as with John the Baptist (Benjamin M. Stewart 2011, 27).

4.2.2 The Eucharist as the thanksgiving of all creatures

"It is in the Eucharist that all that has been created finds its greatest exaltation. Grace, which tends to manifest itself tangibly, found unsurpassable expression when God himself became man and gave himself as food for his creatures. The Lord, in the culmination of the mystery of the Incarnation, chose to reach our intimate depths through a fragment of matter. He comes not from above, but from within, he comes that we might find him in this world of ours. In the Eucharist, fullness is already achieved; it is the living centre of the universe, the overflowing core of love and of inexhaustible life. Joined to the incarnate Son, present in the Eucharist, the whole cosmos gives thanks to God. Indeed, the Eucharist is itself an act of cosmic love: 'Yes, cosmic! Because even when it is celebrated on the humble altar of a country church, the Eucharist is always in some way celebrated on the altar of the world.' (John Paul II., Encyclical *Ecclesia de Eucharistia* No. 8). The Eucharist joins heaven and earth; it embraces and penetrates all Creation. The world which came forth from God's hands returns to him in blessed and undivided adoration: in the bread of the Eucharist, 'creation is projected towards divinization, towards the holy wedding feast, towards unification with the Creator himself.' (Benedict XVI, Homily at the Eucharistic Celebration of the Solemnity of the Body and Blood of Christ, 15 June 2006). Thus, the Eucharist is also a source of light and motivation for our concerns for the environment, directing us to be stewards of all creation" (LS 236).

I have deliberately quoted this passage from *Laudato si'* unabridged because it contains dense Creation spirituality of the Eucharist. In bread and wine, the gifts of Creation of this celebration, the celebrants symbolically bring the whole of Creation, especially their own lives, before God. This offering is first and foremost an expression of gratitude to the Creator. Together with all creatures, man praises his God and Lord, for those who celebrate the Eucharist know how much has been given to them undeservedly. At the same time, the offering of gifts is connected with the hope of receiving an even greater gift in return from God: the Eucharist has the structure of sacrifice, of renunciation in the hope of greater gain. This gain is also hoped for not only for the small, narrowly limited community of those celebrating, but for the whole of Creation: the Eucharist is the celebratory anticipation of the end-time, all-encompassing peace of Creation. This anticipation takes place in the inclusion of all Creation in the mystery of Jesus' death and resurrection. The mortality of creatures is not eliminated, but preserved and surpassed. Finally, it should not be overlooked that the Eucharist is a meal. The meal as a culturally designed form of human nourishment is, however, one of the basic processes of creatureliness. It is precisely in their dependence on food that creatures experience their dependence on their Creator and Sustainer. At the same time, the meal creates community and moves those celebrating to share fairly the limited gifts of Creation entrusted to them.

To what extent is such Creation spirituality of the Eucharist visible in the *liturgical texts*? What does the Roman Rite Mass currently say about the transformation of Creation (Joris Geldhof 2019)? The *offertory prayer* over bread and wine, inspired by Jewish prayers of blessing (*berachot*), was reformulated in the 1970 missal: "Blessed are you, Lord our God, creator of the world. You give us bread, the fruit of the earth and of human labour. We bring this bread before your face that it may become for us the bread of life." Moreover, "Blessed are you, Lord our God, Creator of the world. You give us wine, the fruit of the vine and of human labour. We bring this cup before your face, that it may become for us the cup of salvation." This prayer expresses that the gifts are received from the Creator and only then offered by believers. Creaturely nature and human culture are unseparated and unmixed in them—bread and wine are fruits of the earth and human labour. These material foods become spiritual food and drink.

A few *prefaces* address the theme of Creation: The "Preface for Sundays V: Creation" first mentions that God called Creation into existence and subjected it to the change of time ("Qui omnia mundi elementa fecisti, et vices disposuisti temporum variari"). Then it addresses the image of God

in the human being, to whom God "handed over" Creation in order to "rule" over it (in Latin, this is supplemented by "vicario munere"—i.e. "in the office of the representative"). Strictly speaking, the text thus "only" addresses formal anthropocentrism, but not material anthropocentrism. Moreover, praise for God is mentioned as the goal of human dominion over Creation, praise that is carried out "with the whole Creation" (a remark that is missing in the Latin version), which removes the ground for any arbitrariness. By its nature, the text remains relatively short, and the abstractum "whole Creation" is not very descriptive. Nevertheless, its openness to creation-ethical impulses cannot be overlooked, and above all as early as in 1970, even before the Club of Rome report! A second preface that is relevant to Creation is the "Preface for Weekdays I: The Renewal of the World through Christ", which unequivocally testifies to Christ's redemptive action for the whole of Creation. There, it says: "You have made him the head of the new creation... Therefore you have exalted him above all creatures...". Here, inspired by the hymn to the Colossians, a double relationship of Christ to his creation and all creatures is thematised, while humanity as a separate, exclusive group is not mentioned at all.

As far as the *Eucharistic Prayers* are concerned, "it is nevertheless noticeable that the significance of creation-theological motifs and implications in the Eucharistic Prayer... is only little reflected" (Jörg Müller 2017, 91). In fact, only the two new High Prayers III and IV, formulated after Vatican II, contain references to the theme of Creation. All the older Eucharistic Prayers from the early Church onwards surprisingly had no reference to Creation at all (Thomas J. Talley 1993, 13–27). In the transition from the Sanctus to the words of institution, High Prayer III contains two formulations: "all your works declare your praise"—"merito te laudat omnis a te condita creatura" and "you fill all Creation with life and grace"—"vivificas et sanctificas universa". While the first addresses the action of all creatures before God, the second names God's actions towards all creatures. In both respects, human beings do not have an explicitly special role.

Even more so, however, High Prayer IV conveys a "cosmic sense" (Joseph Gelineau 1968, 35–53). Already in its own preface, assigned to this High Prayer, it says: "You have created everything, for you are love and the source of life. You fill your creatures with blessings and gladden them with the splendour of your light."—"qui unus bonus atque fons vitae cuncta fecisti, ut creaturas tuas benedictionibus adimpleres." These allusions to Gen. 1 lean heavily towards biocentrism, for the blessing and joy of creatures signal their intrinsic worth. After the Sanctus, there is again direct recourse to the first Creation narrative and the specific role of

man: "Man you created in your image and entrusted to him the care of the whole world. Over all creatures he should rule and serve you alone, his Creator."—"Hominem ad tuam imaginem condidisti, eique commisisti mundi curam universi, ut, tibi soli Creatori serviens, creaturis omnibus imperaret"⁹. In this sentence, caring (*cura universi*) and ruling (*imperare*—a very steep term) are two mutually interpreting terms that sum up the image of God well in the sense of formal anthropocentrism. That the ductus of the IV High Prayer is materially biocentric is clearly underlined in its final sentences, when it says: "And when the whole Creation is freed from the corruption of sin and death, let us together with it glorify you in your kingdom"—"in regno tuo, ubi cum universa creatura, a corruptione peccati et mortis liberata, te glorificemus." Thus Enrico Mazza (2004, 189) can summarise: "the human person is priest for creation [...] the aspiration of every creature is satisfied."

After analysing the texts, we turn again to the instructions for the *Eucharistic matter*. Theologically, there is little reflection on this. "In much current eucharistic theology, there is curiously little concern for the created, material elements of bread and wine" (David Grumett 2019, 233). This lack of theological reflection is matched by practical neglect. The Eucharist is "celebrated" as fast food. "Although churches and theologians congratulate themselves, and rightly so, for promoting wide Eucharist participation, they have become unwitting promoters of a secular model of mass consumption and exchange..." (David Grumett 2019, 234).

In the first centuries, Christians brought bread and wine for the Eucharist themselves. The bread could have three different forms (cf. Max Währen 2004, 11–21; Michael Rosenberger 2014, 116–119):

- Usually it was a *round loaf of everyday leavened bread* decorated with a cross notch, as can be seen in numerous early Christian images. The 16th Synod of Toledo in 693 admonished that only a whole loaf, not yet cut, should be used. In most Eastern churches, the leavened loaf is still the Eucharistic species today.
- The form of a "*corona consecrata*" was also widespread. This ring-shaped pastry, which looks like half a pretzel, is mentioned in the *Liber pontificalis* I,339 (6th–9th century) and Gregory the Great (*Dialogi* IV, 55). It is also depicted on several early Christian sarcophagi and in the floor

9 One might ask why man should serve God alone. The Latin text could also be understood differently: "to serve you, his only Creator...". Theologically, man is supposed to serve God in creatures—and so the "alone" is contradictory when it is related to the verb "to serve".

mosaic in the 4th century basilica of Aquileia. Until the late Middle Ages there are many other depictions, especially depictions of the Last Supper from the 15th century.

- The *host* in the form of a coin ("in the manner of a denarius", according to Honorius of Autun between 1110 and 1130, because Christ was "the true denarius", cf. Eucharistion, PL 172, 1256C-D) made of unleavened dough only appeared towards the end of the first millennium with the invention of the baking iron. It has above all the very practical advantage that it does not have to be broken and thus no crumbs can fall to the ground.

For the communion of the sick, a few pieces of bread from the Eucharist have been kept since the 3rd century. From the 6th century onwards, a closable tabernacle was set up for this purpose in the "sacristy", literally the place of the saint, which was gradually moved into the church interior from around 800. The storage of hosts for distribution at the next Eucharistic celebration has only been attested to since the 11th century and has been common since the 17th century. In other words, in the Western Church, value was still placed on fresh bread until the Baroque period—the use of old, preserved varieties is a relatively recent bad habit. And it only concerns the Western Church—in the Eastern Church, fresh bread is still used at every Eucharistic celebration.

Until the 13th century, communion using both species bread and wine was customary. Only since that time has it been the norm in the West for only the priest to receive communion in the chalice, while in Eastern rites both species are served to this day. The reformers of the 16th century reintroduced the original practice of communion using both species. The wine was exclusively red wine until the middle of the 15th century. In 1478, white wine was permitted by Pope Sixtus IV. Since wine adulterations have been numerous, the Church issues regulations on its purity and controls its production. The wine must be made from grapes, while sugar or other additives are forbidden. Today, these requirements are met by all quality wines in the European Union. Table wine, on the other hand, is not permitted as mass wine because it is diluted with water. Since 1994 it has been permissible to use grape must in exceptional cases with the explicit permission of the bishop. The prerequisite is that the priest is demonstrably not allowed to drink wine for health reasons. In addition, the nature of the must may not have been altered. Therefore, only freezing can be used for preservation, because sterilisation turns must into grape juice (Letter of the Congregation for the Doctrine of the Faith of 22.8.1994 and 24.7.2003).

The following regulations are currently in force (IG = *Introductio generalis* of the *Missale Romanum* 2002³ (1970¹), RS = *Instruction Redemptionis Sacramentum* 2004; in the sections referred to here, the IG is essentially still identical with the first edition of the post-conciliar *Missale Romanum* of 1970):

- The bread must be unleavened, made of pure wheat flour and fresh, so that there is no danger of spoilage (IG 320; RS 48).
- The logic of the signs demands that they be perceptible as food and drink (IG 321).
- Therefore, the bread must be broken into different parts to be distributed to believers (IG 321; RS 49).
- If the large number of faithful requires it, small, non-divisible hosts may also be used, but the gesture of breaking bread will be more clearly recognisable as a sign of unity if a single loaf of bread is broken and distributed (IG 321).
- The wine should be natural and pure (IG 322; RS 50).
- It is important to ensure that the bread and wine are well preserved. Under no circumstances should the wine be sour (IG 323; RS 50) or the bread spoiled or so hard that it can hardly be broken (IG 323).

As can quickly be seen, the 2004 *Instruction of the Congregation for Divine Worship and the Discipline of the Sacraments* considerably weakens the provisions of the immediate post-conciliar period, which are excellent in themselves, by its very omissions: there is no longer any mention of recognisability as food and drink. The value and significance of the gesture of breaking bread are no longer mentioned. Indeed, a formulation is even inserted which directly undermines it: "Usually small hosts are to be used to a large extent, which do not need any further breaking." (RS 49). With this the Congregation approves of what is *de facto* practised in most of the Churches in the world according to Vatican Council II, just as before. The departure towards a renewed Eucharistic meal culture, which can be sensed in the *Introductio generalis*, has been stopped.

In themselves, the provisions are very clear in their values: the best material species are only good enough for the Eucharist. They should be recognisable as food—and I add: to be tasted—and shared with each other. What is missing is a clearer option in favour of the communion of the chalice by all present. And finally, of course, it would be desirable to return from the wafer host to proper bread or pastry. One of the reasons for the change to the wafer was, above all, the fear that breadcrumbs might fall. For the same reason, the lay goblet was abolished, because drops of wine could fall to the ground. This fear goes back to the first Christian cen-

turies. Thus, even Tertullian (*De corona militis* 3,4) writes: "We also suffer fearfully lest any of our cup and bread fall to the ground." The *Traditio apostolica* writes (TA 37–38), "Let all take care that no non-believers taste of the Eucharist, no mouse or other animal, and that nothing of it falls and is lost. For it is the body of Christ that is to be eaten by believers and not despised. After the cup is blessed in the name of God, you have received it as the antitype of the blood of Christ. Therefore do not spill any of it for a foreign spirit to lick it up, because you have spurned it. You will be one who despises the blood, the price with which you were bought." Good as it is to be careful and cautious with the Eucharistic species, the two texts testify a fear that borders on superstition. This fear is still the greatest obstacle to the introduction of real bread and the cup for all.

4.2.3 The other sacraments

The other sacraments also show references to Creation, even if not all have the same intensity. *Confirmation*, as the affirmation and completion of baptism, signifies the mission of the confirmed in the Church and the world, including the mission of environmental and co-environmental responsibility. However, this mission is not named in the liturgical prayers, and anointing with oil, the material sign of Confirmation, is only formally interpreted as being similar to Christ, but is not explained in material terms. Both in terms of the rite and the texts, the Sacrament of Confirmation remains pale and reflects the theological perplexity about its meaning.

Actually, the acceptance of physical suffering and infirmity is a constitutive part of the affirmation of creatureliness. In the celebration of the *anointing of the sick*, however, no reference is made to this. In part, this may be due to the justified desire to keep the celebration short in view of the physical condition of the seriously ill. However, a reference to the theological dimension of the anointing of the sick would have been possible. There is a lack of existential depth here.

The reference to Creation becomes clearer in the *sacrament of marriage*. Scripture readings from the Creation narratives Gen. 1–2 are suggested as an option. The prayer of blessing over the bride and groom, the high prayer of the sacrament of marriage, refers in all four forms to the Creation of human beings as man and woman. In addition, the procreation and upbringing of children is interpreted as special participation in the creative work of God. Finally, the bride and groom promise each other their fidelity in health and sickness until death—again addressing human mor-

tality. Appropriate to the occasion, the focus of the celebration remains anthropocentric (not anthropocentrist!). The non-human Creation does not come into view; only the optional reading of Gen. 2:18–24 includes animals and suggests that the "universal family" of which LS 89 speaks includes more than just humans. Yet one could have placed precisely the fertility blessing for man and woman in the context of the fertility blessing for animals, for in Gen. 1 and Gen. 9 this blessing is given to all living creatures. Procreation of offspring and family formation is not a specifically human process—humans share it with many creatures.

In the celebration of the *ordination* (of deacons, priests and bishops), the references to Creation are certainly not very immediate. It is about the ministry of the Church. Nevertheless, service to the world is a declared part of this task. That is why the ordaining bishop asks the candidates before the actual act of ordination, among other things: "Are you ready to assist the poor and the sick, to help the homeless and the needy?" Here, on the basis of the encyclical *Laudato si'*, it would be necessary to add: "... and to take care of the earth, which is 'among the most neglected and mistreated poor!'" (cf. LS 2). An analogous addition in the prayer of consecration itself would strengthen this idea and take account of the high rank of this mission.

The last remaining sacrament, the *sacrament of penance*, needs the reference to Creation less in its ritual than in the personal confession of guilt. And this is where there is probably the greatest need to catch up. For the common confessional mirrors of the old as well as the new hymnal and prayer book "Gotteslob" are structured according to the Ten Commandments—a structure that corresponds to the Catechism of the Catholic Church, but not to post-conciliar considerations of moral theology. No. 600 of the 2013 German-language hymnal and prayer book "Gotteslob" asks under "Respect property": "Have I contributed to environmental pollution or destruction? How do I behave towards animals?" As meaningful as these questions are, they are robbed of their Creation-theological point by subsuming them under property relations. Compared to this, No. 601 takes the Third Commandment on the day of rest a step further when it asks: "What does the beauty of Creation mean to me? Can I encounter it with awe and wonder and experience God in it?" Subsumption under the Sabbath commandment places Creation in direct reference to God and points to its own being independent of human beings. Under the VII. and X. Commandments on property, on the other hand, No. 601 falls back to the previous level: "Am I willing to reconsider my consumer behaviour and strive for a moderate and Creation-friendly lifestyle?... Do I respect the

earth as a home of life for all people?" This is strictly anthropocentric thinking: the earth is only worth preserving for the sake of humans. Better is the Confessional Mirror for Children No. 598, which is structured according to areas of life and classifies animals in the category of family life: "Have I taken care of our pet? Have I hurt animals?" These formulations already suggest a proximity to the "universal family" of LS 89. All in all, the confessional mirrors in the "Gotteslob" could still be improved.

4.2.4 The earth rite of burial as a return to the earth

From a pastoral point of view, the ecclesiastical funeral celebration occupies a prominent place in people's lives, far beyond their perception of most sacraments. Within this celebration, in turn, the most meaningful moments are the lowering of the coffin and the heaping of earth onto it.

The earth rite is a clear reminder of one's own creatureliness. The liturgist says: "From the earth you were taken and to the earth you will return. But the Lord will raise you up." Benjamin M. Stewart (2019, 363–366) rightly points out, I think, that the second phrase annihilates the first. Nothing against the resurrection message, but it does not belong to the earth rite, but to the sprinkling of the coffin with holy water, that is, to the remembrance of the baptism of the deceased. Stewart points to the much wiser formulation of the earth rite in the Greek Orthodox funeral service: "The earth is the Lord's, and the fullness thereof; the world, and all that dwell therein (Ps. 24:1). You are dust, and to dust you will return (Gen. 3:19)." (Greek Orthodox Archdiocese of America 2017, Funeral Service, in: <https://www.goarch.org/-/funeral-service>, retrieved 31.10.20). Here another scriptural quotation precedes the sentence from Gen. 3:19 and cannot trump the drama of being earth. Rather, it is embedded in a confession that everything is in God's hands. Thus, creatureliness receives its own dignity and appreciation.

The sinking of the body into the earth is at the same time a return of the body to the earth—like "giving something back" (Benjamin M. Stewart 2019, 371). The body returns to the cycle of nature and can nourish flowers, worms and other living things. This is a theologically and spiritually significant fact. As the Australian theologian Val Plumwood, who was nearly eaten by a crocodile in 1985, writes: "It is not a minor or inessential feature of our human existence that we are food: juicy, nourishing bodies." (Val Plumwood 2012, 10).

In Anglo-Saxon countries, the "natural burial movement" is currently spreading: The basic pillars include the renunciation of embalming the corpse with formaldehyde or other environmentally harmful chemicals, the renunciation of cremation for reasons of climate protection, an ecologically easily degradable coffin and the sinking of the coffin into the earth in such a way that at least no negative, but if possible a positive ecological effect emanates from it (Benjamin M. Stewart 2011, 77–86; 2012, 62–72). While the real ecological impact of the sacraments is extraordinarily small and Creation comes into play mainly on the symbolic level, the ecological consequences of a funeral are considerable—and are still little considered. Greater coincidence between faith in Creation and environmental action is urgently needed here.

4.3 Tuning in with Creation. Creation spirituality in (liturgical) prayer

Also, (liturgical) prayer expresses the spirituality of Creation. This applies first of all to the prayer of Christians par excellence, Our Father. Another rich source is the Church's Liturgy of the Hours, which will be examined in the second section. Finally, a painful gap should be pointed out: the prayer of lamentation, which has hardly been cultivated in recent centuries and yet is so necessary in the environmental debate.

4.3.1 The Lord's Prayer

The way the Lord's Prayer has been handed down in biblical texts, it is unlikely to have come from Jesus word for word. Exegetically, it is easy to see that evangelists have developed and shaped it further. Nevertheless, the original voice of Jesus is perceptible. After the salutation, the prayer has three "You-petitions", which in the original Greek end with σοῦ (your) and direct the gaze towards God, and three "We-petitions", in which ἡμεῖς/ ἡμῶν/ ἡμῖν/ ἡμᾶς (we/ our/ us/ us) occurs seven times and directs God's gaze towards the intentions of those praying. Two of the six petitions have a special reference to Creation, one for you and one for us.

The second You-petition "*thy kingdom come*" may, indeed must, be read in the light of Creation spirituality beyond pure anthropocentrism. If in Christ the final peace of Creation is initially realised (Mk. 1:13), then the reign of God encompasses the whole of Creation, not only humanity. The dawning of this reign brings justice for all creatures.

The first We-petition, "*Give us today our daily bread*", is about the necessary, abundant basis of human life. In a time when the bread of the coming day was not certain, this petition undoubtedly had a haunting ring. But even in an industrial society that offers a maximum of food security, it can remind us that this is not a matter of course, but a gift of the Creator God. In Matthew, the bread petition of the Lord's Prayer is closely related to another text that follows only a few sentences later (Mt. 6:25–34): Jesus' exhortation to carelessness. This exhortation applies equally to men's care for food and women's care for clothing. Using the example of the birds, which are fed by God, and the flowers, which are clothed by God, men and women are to learn what carelessness is in the context of the distribution of tasks at that time: trust in the Creator, who means well with his creatures and gives them enough to live on. The last sentences of this passage are particularly urgent: "So do not worry and ask: What shall we eat? What shall we drink? What shall we put on? For all these things are the concern of the heathen. Your heavenly Father knows that you need all these things. But you must first be concerned about his kingdom and his justice; then everything else will be given to you in addition." (Mt. 6:31–33) In these tremendously dense sentences, the Jesuan ethic and spirituality are brought to the fore: maximum human commitment to justice—and maximum trust in the nurturing care of the Creator (cf. chapter 10.1). These two aspects are not contradictory, but rather condition each other: Only those who commit themselves with all their might to justice leave God free and do not degrade him to a fulfiller of wishes. And only those who trust completely in God do not become dogged and morally sour in their commitment, like a doer who constantly puts himself under pressure. The combination of trust in God and commitment breathes boundless freedom—for people and for God.

The Lord's Prayer thus contains two petitions that closely connect human beings and non-human creatures. The broad horizon of Jesus' spirituality of Creation becomes palpable.

4.3.2 The Liturgy of the Hours

The Liturgy of the Hours of the Church is not only a textual witness to the spirituality of Creation but is itself, already in its form, spirituality of Creation, since it is integrated into the rhythm of Creation (cf. on the following Michael Rosenberger 2012, 109–112). This becomes clear in its central form for Western Christianity in the Rule of Benedict. Seven times

a day the community gathers for prayer (RB 16). Every seven days the entire Psalter is prayed through, beginning on the first day of the week, Sunday, with the night hour (RB 18). In this way, Benedict consciously builds a bridge to the seven-day work of the first Creation narrative: the rhythm of prayer is aligned with the rhythm that the Creator has placed in his Creation from the beginning. The praying person is in harmony with the whole of God's Creation, he joins in the great symphony of God's praise through his Creation and thus places himself with it in the hidden presence of the Creator.

In this context, it also becomes understandable why the ancient hymns of the Liturgy of the Hours very often recall the creation of the world in Gen. 1 (Peter Jeffery 2019, 137–164; likewise, Enzo Lodi 1998, 111–129). This is already true for three of the five genuine hymns of Ambrose of Milan (339 Trier–397 Milan):

- Aeterne rerum conditor/ Maker of all, eternal King (according to RB 9:4, the hymn of the nocturn, in the four-week Psalter the hymn of Lauds on Sunday of the 1st week).
- Iam surgit hora tertia (according to RB 17:5, the hymn of the third, not included in the Four Weeks Psalter).
- Deus creator omnium/ God That All Things Didst Create (according to RB 17:8, the hymn of Vespers, in the Four Weeks Psalter the hymn of First Vespers on the Sunday of the 1st week).

In the current Book of Hours, the hymns of Vespers address the seven-day work of Genesis 1 and explicitly tell of the respective day of Creation. They probably originated in the 7th–9th centuries in an Irish monastery in France. Only on Saturday evening is the older Ambrosian hymn used, which the poet of the younger hymns most likely knows and reverently wishes to preserve.

It can thus be said that the hymns of the late antique and early medieval Liturgy of the Hours are closely interwoven with the Creation narrative. Only the Ambrosian hymns for Lauds and for Advent turn to Christ. Otherwise, the Creation theme dominates. The praying person places himself in the great work of God's Creation—he prays in harmony with the whole of Creation. This also corresponds to the basic idea of many Psalms. Psalm 148 in particular is an eloquent example of the invitation to the whole of Creation to join in the praise of God. Yes, the last sentence of the book of Psalms, which can be interpreted as a summary of all 150 Psalms, reads: "Let everything that breathes praise the Lord. Hallelujah!" (Ps. 150:6)

However, the Liturgy of the Hours not only has strong references to the biblical texts of Creation, but also to the rhythms of real Creation, i.e.

to the rhythm of day and night and the rhythm of the seasons. The two defining hours are Lauds and Vespers. One is prayed at sunrise, the other at sunset. Vigil is prayed at the first light of dawn, Compline at the last light of dusk. The other three Hours, Terce, Sext, Non, divide the sunlit day into four sections of equal length. So that this order can be realised equally in view of the different work requirements in summer and winter, Benedict gives a different measure of prayers for the seasons (RB 8–18). In summer, there is less prayer and more work, and vice versa in winter. This may have been an economic necessity in pre-modern times, but for Benedict it becomes a theological and spiritual programme: the praying person fits into the natural rhythms. At sunrise, he hears the birds and sees the day becoming brighter, and at sunset he feels the coming of silence and the envelopment of darkness.

With the invention of the mechanical clock and even more so with the invention of electric lighting, the Benedictine monastic world also broke away from the rhythms of Creation—from the daily rhythm as well as the annual rhythm. This step, which is unilaterally interpreted as emancipation in the modernist narrative of progress, was momentous. It may have favoured the misinterpretation of the mission of dominion in Genesis 1 more than we have been aware of so far. In any case, it must also be read as a step towards the alienation of humans from nature.

4.3.3 The missing lament prayer

When Creation is taken into prayer, it is often in the form of praise, thanksgiving and wonder. Supplication (like that for daily bread) is also a common form of prayer in this context, sometimes as a request for forgiveness for our "environmental sins", as they say. One form, on the other hand, which is abundantly attested to biblically, is hardly ever found in our Creation spirituality at present: lament.

How can we adequately bring non-man-made natural disasters into prayer? The same applies to anthropogenic natural destruction when the culprits are not so easily identified. The Catholic missal of 1970 has some such situations in mind under the "Masses for various needs and occasions", e.g. earthquakes (no. 34) and storms and storms (no. 37). In the Greek Eastern Church there is even a liturgical commemoration of the great earthquake of Constantinople on 26.10.740 (André Lossky 1998, 131–151). But there the prayer is always immediately for salvation from distress. At the same time, in the Gospel of the day about the calming

of the sea storm, Jesus sadly asks his disciples at the end why they have no faith. It seems as if the Church is just as incapable of speaking as the disciples in the swaying boat.

In view of the gigantic ecological threats, catastrophes and destruction, Timothy Hessel-Robinson (2012, 41) therefore suggests that the Church should develop prayers of lament. For its current lack of speech leads to deafness and paralysis, and precisely these two attitudes can be observed in abundance. Lament, says Hessel-Robinson, is an authentic expression of one's feelings and testifies to a proactive attitude, not fatalism. Lament is a companion of hope, not its opposite. Only by lamenting can one avoid slipping into cheap consolation (Timothy Hessel-Robinson 2012, 41). Lament makes the unspeakable speakable and makes those lamenting feel solidarity and compassion with those who suffer.

Given the abundant biblical examples of lament prayer, it must be surprising that it is so little practised in the praying of the Church. Five elements of biblical lamentation could be helpful if we are to be able to speak in the environmental catastrophes of the present:

- The unsparing and empathetic description of misery (e.g. in Lam. 1). It seems grotesque that such a description does not occur at all in the "Masses for special intentions".
- The description of one's own feelings in the face of this misery. In the Book of Lamentations, for example, it sounds like this: "At this I must weep, mine eye, yea, mine eye runneth down with tears." (Lam. 1:16) "My inward parts burn; my heart is turned within me." (Lam. 1:20) "I groan without ceasing, and my heart is sick." (Lam. 1:22)
- The crying out of one's own pain, e.g. in cries of woe (Lam. 1:1; 2:1; 4:1 a.o.).
- The questioning, even if it remains without an answer: "How much longer?" (Ps. 6:3; 13:1-2) "Why?" (Lam. 5:20; Ps. 10:1; 22:1; 43:2) "Where?" (Ps. 42:3; 79:10) (Timothy Hessel-Robinson 2012, 43). Again, it is paradoxical that, unlike the Bible, official liturgical prayers do not include such questions.
- And finally, the humble request that God sees the misery, but without making a demand that and how he should act: "Behold my misery, O Lord!" (Lam. 1:9) "Lord, look and see how I am despised." (Lam. 1:11) "Lord, behold how I am afraid!" (Lam. 1:20) "Lord, remember what has happened to us; look here and see our shame!" (Lam. 5:1).

Lament is a form of prayer that endures pain by expressing it. It does not put it off, it does not ask for an end, it simply looks the pain in the face and seeks only one thing: compassion. This is often more honest than any-

thing else and at the same time an enormous psychological relief. Because what we express, we can also let go of and surrender, at least in part. For people in the environmental movement, who often wear themselves out for decades in their commitment to the environment and hardly achieve any success, the prayer of lament is an important spiritual source.

4.4 Sharing the Easter Bread. Creation spirituality in the church year

Over the course of several centuries, Christian liturgy has developed a "church year" that complements the weekly cycle, which has been dominant from the beginning and is centred on Sunday as the day of Christ's resurrection, with an annual cycle centred on a number of important high feasts. This includes not only the high feasts themselves, but also times of preparation and follow-up. The question is what role the faith in Creation plays in this cycle.

Originally, the major church festivals go back, at least in terms of their dates, to events in nature: Easter, like the Jewish Pesach, to the first harvest of barley, Christmas as the "successor" to the festival of the Roman sol invictus to the day of the winter solstice. However, this external reference only applies to the northern hemisphere of the earth. If one does not want to introduce a two-part liturgical calendar on the globe, seasonal references may only be used indirectly for the theological interpretation of the festivals. This will therefore be dispensed with in the following, for in the marked times of the church year, the basic tension of Creation and redemption is made clear in its own way, even without reference to their seasonal locations.

In *Advent*, it is the groaning of Creation, which "lies in birth pangs" (Rom. 8:22) and longs for its redemption, that is expressed liturgically. Programmatically, the Old Testament readings of the Sundays of Advent in reading year A make this clear: On the first Sunday, the great vision of the pilgrimage of the nations to Zion (Is. 2:1–5) is presented. On the second Sunday of Advent, it is the second great vision of the Old Testament, the vision of the messianic peace of Creation (Is. 11:1–10). From the global view of humanity on the first Sunday, the view widens on the second Sunday to the whole of Creation. The reading on the third Sunday of Advent remains faithful to this broadened perspective, telling how the desert of Israel begins to blossom anew with the return of the people from Babylonian captivity (Is. 35:1–6a.10). Finally, on the Fourth Advent, the announcement of the birth of a royal child is read (Is. 7:10–11). This

sequence of four Isaiah texts makes it unmistakably clear that the Messiah will transform and enliven the whole of Creation.

On *Christmas Day*, the dichotomy of Creation and redemption in the Gospel of John's prologue (Jn. 1:1–18) is interpreted in terms of the mystery of the Incarnation as Christ becoming a creature. However, while the preface for Christmas II ("He heals the wounds of all Creation"—"in integrum restitueret universa") and the benediction ("In Christ God has joined heaven and earth"—"qui per eius incarnationem terrena caelestibus sociavit") must be read biocentrically or even ecocentrically, the collect prayer narrows the Christmas message anthropocentrically: "O God, who wonderfully created the dignity of human nature and still more wonderfully restored it, grant, we pray, that we may share in the divinity of Christ, who humbled himself to share in our humanity"—"Deus, qui humanae substantiae dignitatem mirabiliter condidisti, et mirabilius reformasti: Da nobis eius divinitatis esse consortes, qui humanitatis nostrae fieri dignatus est particeps." As wonderful as the idea is to relate human dignity to Creation by God and redemption in Christ, and as wonderful as the Latin formulation of the last half-sentence is, which unlike the English translation contains the "dignatus est"—"he found it worthy", a reference back to human dignity in the first half-sentence—it could just as well have been formulated non-anthropocentrically, especially on such important solemnity: "O God, who wonderfully created all creatures in their dignity and still more wonderfully restored them, grant, we pray, that we may share in the divinity of your Son, who found our creaturely nature worthy and accepted it."

Such a biocentric formulation would have been more in keeping with the *sensus fidelium*. For since as early as the 4th century, believers have placed the *ox and donkey at the manger* in which the divine child lies: "Since the earliest times, the two animals [...] have always belonged to the manger. St. Joseph can be missing, even the mother can be missing, but never the child with ox and donkey." (Joseph Ziegler 1952, 402). The Church Fathers often interpreted the scene allegorically, sometimes also naturalistically. In both interpretations, however, the animals are portrayed in a very appreciative way. Thus Jerome (347 Stridon/Dalmatia–420 Bethlehem) writes: "'And she laid him in the manger.' Why in the manger? So that the prophecy of the prophet Isaiah would be fulfilled: 'The ox knows its owner and the donkey the manger of its master' (Is. 1:3). In another place it is written: 'You will protect people and animals, O Lord' (Ps. 35:7). If you are a man, eat bread; if you are an animal, come to the manger." While Jerome emphasises the equal protection of the divine

child for humans and animals, Peter Chrysologus (c. 380 Classis near Ravenna–451 Ravenna) emphasises the greater openness of animals to the incarnate Son of God: "The animals received him in the manger, whom you would not receive into your house." (Peter Chrysologus, *Sermo* 156). And the apocryphal Gospel of Pseudo-Matthew (earliest between 600 and 625 AD) concludes in chapter 14: "So even the animals, ox and ass, worshipped him continually while they had him between them." At the latest with Francis of Assisi in 1223, but probably a little earlier, the ox and donkey are then also found in the liturgical celebration in the Church (cf. Thomas of Celano, *Vita prima S. Francisci* XXX, 84–87). They thus belong to the Holy Family, are, as it were, Jesus' older siblings and have "received a little brother" in him. Yes, they are even closer to the divine child than Mary and Joseph—the spatial arrangement is an image of the spiritual connection. Thus, the two animals testify: "The event of Bethlehem... has consequences for the whole of creation, not just for us humans" (Theodor Maas-Ewerd 2000, 195). For this reason, the ox and the donkey found their way into the official liturgy of the Hours of Christmas as late as the 1st millennium. Until the liturgical reform after the Second Vatican Council, the following responsory was found there: "O magnum mysterium et admirabile sacramentum, ut animalia viderent Dominum natum, iacentem in praesepio. Beata Virgo, cuius viscera meruerunt portare Dominum Christum. Alleluia."—"O great mystery and wonderful sacrament, that animals saw the Lord born, lying in the manger. Blessed is the Virgin whose womb was worthy to bear Christ the Lord. Alleluia."

Another popular church tradition in many European countries says that Christmas Eve is the night "when the animals talk". They talk about the treatment they have received from humans during the past year, accuse or praise their keepers, and not only those still living, but also deceased animal owners. It is a kind of divine day of judgement because the child in the manger is listening to them. Even if it is "only" a beautiful legend, it still reminds people to treat animals well and with respect. And the fact that it is timed precisely at Christmas establishes the connection to God's becoming a creature: "Inasmuch as ye have done it unto the least of these my sisters and brethren, the creatures, ye have done it unto me."

The Easter cycle begins with *Ash Wednesday*, the day of "contemplation of the dust of mortality" (Benjamin M. Stewart 2019, 362). The "sacramentum" of this day is that the worshippers have "ashes sprinkled on their heads". The remembrance of one's own mortality as the most impressive feature of creatureliness is thus placed before the reflection on one's own sin. It is only in the view of death that the deepest threat and the utmost

radicality of sin are illuminated. However, apart from the blessing of ashes, the liturgical texts are more introductory texts for the Easter penitential season than for the *memento mori* of Ash Wednesday. This is understandable, but a pity. A reading from Gen. 2–3 about the commissioning of man, formed from dust, to cultivate and care for the earth would undoubtedly have a special Creation-theological power in this celebration.

The *renunciation of food*, which is supposed to characterise Lent, can reinforce the *memento mori* of the ash rite: Food, as the most necessary creaturely act for survival, recalls one's own mortality more than any other human act, and fasting intensifies this reference. The Church's practice of fasting involves both quantitative aspects of fasting (e.g. only eating once a day) and qualitative aspects (so-called abstinence, e.g. from meat and alcohol). Traditionally, the forty days before Easter were very strict in both respects, and in the Eastern Churches they still are today. On the Catholic side, fasting has been reduced and "liberalised" so much since Vatican II that it is almost imperceptible. Instead of parishes and monasteries, it now takes place in adult education centres and health centres. Yet fasting is an expression of the spirituality of Creation and a strong symbol of the peace of Creation (Ioan Moga 2017, 109–112), for the temporary renunciation of eating other living beings makes us newly and more intensely aware of being woven into the "seamless garment of God's Creation". It nourishes the attitudes of humility and gratitude, justice and reverence.

With the celebration of Jesus' death on *Good Friday*, this dynamic of Lent finds its ultimate vanishing point. The *prostratio*, the laying on the ground of the liturgical services, is a strong symbol of death and takes up the Ash Rite of Ash Wednesday in a second image. The St. John Passion, which is the focus of the liturgy, admittedly has no explicit references to Creation. For the other three Passions, however, this is the case in two places: Mk. 15:33 *parr* tells us that from the sixth to the ninth hour an eclipse came over the whole land. This is not an astronomical fact, but a theological interpretation: If it becomes dark at the sixth hour, i.e. at noon, when the sun normally shines brightest, then with the crucifixion of Christ the order of Creation from Gen. 1 is turned upside down. It is a cosmic catastrophe, as announced by Am. 8:9 (Joachim Gnilka 1979, 321). The whole of Creation is drawn into the disaster that Jesus' crucifixion causes. Mk. 15:38 *parr* in turn tells us that at the moment of Jesus' death the curtain of the temple is torn. According to Flavius Josephus, this curtain, which separates the Holy of Holies of the Temple, consists of a fabric woven from four coloured yarns and symbolises the four elements of fire (scarlet), earth (byssus brown), water (hyacinth blue) and air (purple). The

vault of heaven is woven into the curtain. The curtain "was thus to offer, as it were, a picture of the universe" (Flavius Josephus, *De Bello Iudaico* V, 112–114). With the tearing of the curtain "from top to bottom", the whole of Creation opens radically to God (Joachim Gnilka 1979, 324; Karl Löning/ Erich Zenger 1997, 76–77).

Nowhere is the cosmic meaning of Jesus' death on the cross better expressed than in the symbol of the cross as a tree of life. The hymn of the Lauds of Good Friday sings of this idea, and many crucifixes are designed as tree of life crosses (cf. chapter 3.8). Finally, modern art in particular takes up this idea and establishes a connection to the agonising death of many creatures.

The round of readings for the *Easter Vigil* begins with the first Creation narrative from Gen. 1. This places the Paschal Mystery from the beginning in the context of the creation of the world: "The resurrection means... the re-creation and completion of creation." (Diana Güntner 2009, 196). This is also emphasised in the oration to the first reading: "may those you have redeemed understand that there exists nothing more marvelous than the world's creation in the beginning except that, at the end of the ages, Christ our Passover has been sacrificed." If one places this first reading in its larger liturgical context, further Creation-theological impulses emerge: on Good Friday the whole world was darkened—in the *Easter Vigil* the whole world is illuminated. First the light of the Easter candle, the "light of Christ" is sung about, then the first speech of God in the first reading is: "Let there be light." The light of the resurrection thus shines into the last corner of Creation—this is the impulse of this choreography. All creatures are to share in the paschal light and life. This is also the theme of the Preface for Eastertide IV: "with the old order destroyed, a universe cast down is renewed, and the integrity of life is restored to us in Christ.."—"vetustate destructa, renovantur universa deiecta, et vitae nobis in Christo reparatur integritas."

In some rural areas of the German-speaking world, there was or is a ritual at Easter for the faithful to share their Easter bread, blessed in the liturgy, with the animals. Those who share the bread with each other are literally "companions" (from the Latin *panis*, bread), equal table companions who meet each other at eye level. In the light of the Easter message, animals and humans become equal before God: as equally beloved creatures of the same God and inhabitants of the same great house of life, as equally called to resurrection and chosen by the risen Christ. Easter is the feast where something of the great peace between man and animals can already be experienced. Of course, this ritual can be interpreted as

magic and superstition, and at times it may have been understood as automatically protecting animals from danger. But even then, one can read a value of the animal from it. In purely economic terms, a cow is worth a lot. Remembering this could be an impetus and help to discover and appreciate its unaccountable inherent worth as well. The ritual of shared Easter bread has a dynamic that goes beyond economics—whether one likes it or not. In it, human beings and animals can be experienced in their unique dignity.

In summary, it can be seen that many Creation-theological expansions of the Gospel are offered precisely at the key moments of the church year. They are not always fully developed and savoured in the orations, but they can hardly be overlooked. Birth and death are the two strongest features of creatureliness. Thus, it seems almost imperative that the birth and death of Jesus show intense references to Creation. To address them appropriately is a great liturgical and pastoral task.

4.5 Promising goodness. Creation spirituality in the blessings

In the course of the year, the Church offers a wealth of blessings. Some of these fall within the realm of Creation spirituality. Such blessings of the reality of Creation are deeply related to the "calling good" of created realities by God in Gen. 1. Blessings mean "recognition and assurance of being good" in the name of God (Peter Ebenbauer 2017, 136). Thus, "blessing and being blessed is that religious act... in which a creature makes explicit its unique and original relationship to the Creator of all beings, and... therein also articulates his/her creaturely connectedness with all other creatures..." (Peter Ebenbauer 2017, 137).

Blessings are always counterfactual: because de facto not everything is good, the hope is witnessed and its fulfilment requested that everything will be good (Peter Ebenbauer 2017, 137). Judaism therefore praises and blesses even the negative weather phenomena in relation to the hymn of praise of the three young men in the furnace of fire (Dan. 3:51–90) (Peter Ebenbauer 2017, 143–144). This testifies to a great trust in the Creator, who can change everything for the better, and avoids superstition in a magician or fulfiller of wishes.

Blessings relativise the "technocratic paradigm" of modernity, which the encyclical *Laudato si'* comprehensively criticises: Not everything is possible for man—some things, often the decisive things, must be given to him (Peter Ebenbauer 2017, 144–145). This primal experience of being

thanked and given, which determines creaturely existence, is represented and made fruitful in blessing. Therefore, in the following we will examine how the blessings of the Church bring Creation to the fore.

4.5.1 Blessings around nutrition

As in the Our Father prayer, the concern for sufficient food is one of the most important concerns of humanity. Food is not produced (contrary to the economic diction of "food production") but must grow. It is, with all human labour, first of all a gift. The corresponding blessings are therefore connected equally with petition and thanksgiving.

Under the *request for sufficient food*, the 1981 Benedictional for the German-speaking world has two blessings: One is the weather blessing under No. 8. Three forms are offered for it, the first and the third of which make explicit reference to Creation: "You have entrusted man with your creation" and "You have entrusted the world to us humans" respectively. The other, under No. 80, is the blessing of the fields, pastures and vineyards and exhorts above all to gratitude. In both blessings, one could expand the aspect of ecological responsibility, which has only been present in traces so far.

In the Roman Missal of 1970, the request for food is found in several "Masses for various needs and occasions": Under "No. 33 In time of famine or for those suffering hunger", Form A says "who provide for all creatures" and Form B says "who provide food for all living things". Thus, both prayers are biocentric in nature, without the idea being developed further. No. 35 "For rain", on the other hand, formulates "what sustains us in this present life" in a manner reminiscent of the Lord's Prayer, and No. 36 "For fine weather", in its formulation "what in your goodness you bestow", also shows no reference to non-human creatures. The ecological responsibility of human beings is not addressed at any point.

As far as *thanksgiving* is concerned, we can first note that after Easter and Christmas, Thanksgiving is one of the most attended services of the year—and not only in the countryside. Of course, on Thanksgiving, we do not celebrate a salvation event from the life of Jesus. And undoubtedly the fact that a separate Mass form was only introduced after Vatican Council II proves the pre-conciliar "reserve vis-à-vis Thanksgiving" (Winfried Haunerland 2000, 255). But is Thanksgiving therefore already "not a liturgical feast in the narrow sense" (Winfried Haunerland 2000, 255)? And is it really an exclusively peasant feast that is "decontextualised" outside this

context (Winfried Haunerland 2000, 256)? Does it really need elaborate catechesis and must be "catechetically overformed" (Winfried Haunerland 2000, 257)?

Even in the cities, where farming is not a part of everyday experience and therefore processions of petition or in the fields have no place, the harvest festival enjoys great popularity. This is because the consumption of food is also a basic everyday activity for the urban population. Thanksgiving is first of all the thanksgiving of all those who know what hunger is and that food is not produced but has to grow. There is no need for "catechetising over-forming" to make this clear because all people eat and drink every day. Everyone has felt hungry or thirsty at one time or another. The question of where food comes from is therefore elementary. In the perception of average believers, Thanksgiving is often the only liturgical place where faith in Creation becomes manifest.

In the Eastern Church, the feast of Thanksgiving has a fixed date, the feast of the Transfiguration of Christ (Nicholas Denysenko 2019, 285–306). In the Western Church, on the other hand, we leave the date open—so the feast can be scheduled according to local circumstances, especially in the southern hemisphere. This is a pastoral opportunity, because it opens up the possibility of basing the date on the locally grown food and the local climate. If a lot of grain is grown in a region, the feast can take place earlier than in a wine-growing region. In southern countries it can take place earlier than in northern countries. In this respect, I interpret it as listening to the *sensus fidelium* that the post-conciliar missal contains a form for Thanksgiving (Masses for special intentions no. 27 Thanksgiving).

Textually, the Mass prayers for Thanksgiving contain ethical impulses for the realisation of justice (for sharing the harvest gifts with fellow human beings) and for orientation towards the heavenly gifts. The blessing of the harvest gifts provided for in No. 10 of the 1981 Benedictional for the German-speaking world has the same anthropocentric orientation. Thus, the preface says: "The blessing of the harvest gifts means... the call to think of hungry people and to help care for them...". The prayer of blessing over the gifts says: "You have destined man to subdue the earth, to cultivate it and to make good use of its riches... Let the poor and hungry also experience the riches of your goodness..." Such formulations are negligently blind to the ecological challenges in the year 2020. They urgently need a broadening of horizons.

That nutrition is not one topic among many, but a key theme of Christian spirituality, becomes clear from the fact that the 1981 Benedictional for the German-speaking world also offers nutrition-related blessings in

the family: in No. 57 the blessing of the table and under No. 58 the blessing of bread. In both, as in the blessing of the harvest offerings, only social responsibility for the hungry is addressed. A broadening of the view beyond a human context does not take place.

4.5.2 Blessing of herbs

The blessing of herbs on the feast of the Assumption of Mary has a solitary position among the blessings. It focuses on the experience that man is given healing plants in Creation, which he can and may use for himself as well as for animals. In this he experiences the healing care of the Creator Himself. Of course, magical misinterpretations or irrational exaggerations of old home recipes must be avoided. Not all healing effects attributed to certain herbs in earlier times can be confirmed by today's scientific methods. Also, the separation of "good natural", because they are herbal, and "bad artificial", because they are chemical, remedies or active substances does not do justice to reality. Nevertheless, the actual spiritual message of the blessing of herbs remains valid, that the Creator gives healing remedies to man in many ways. Particularly in the context of modern biotechnologies and their pharmaceutical use of genetic and species diversity, the blessing of herbs could sensitise people anew to the value of this diversity. This is not yet mentioned in the 1981 *Benedictionale* for the German-speaking world under No. 9. At the time it was written, the problem of biodiversity was not yet on the environmental agenda. However, it is prayed for that people "will one day join in the praise of all Creation"—a biocentric thought.

4.5.3 Blessing of the waters

A very special blessing is firmly anchored in the Eastern Churches, which the Western Churches do not know: The Great Consecration of Water on the Feast of Epiphany, which has occasionally even been counted among the sacraments (on the following, cf. Nicholas Denysenko 2019, 285–306; Basil J. Groen 2019, 73–78; Grigorios Larentzakis 2011, 357–358). Unlike the Western Churches, the Eastern Churches celebrate the feasts of the Epiphany and the Baptism of the Lord in a single feast. The Great Consecration of Water, which refers to the second feast idea of the Baptism of Jesus, consists of two parts: On the eve of the feast, i.e. 5 January, the

baptismal and holy water is blessed. After the scripture readings and the prayer of blessing, a cross is immersed three times in the water basin. Afterwards, the faithful drink from the blessed water and take it home to bless their houses and flats. On the feast day itself, i.e. on 6 January, the waters are blessed. Wherever possible, the congregation organises a procession to the nearby river, lake or sea. Following the scripture readings and the prayer of blessing, a cross is thrown into the water and retrieved by swimmers. Fishermen are present with their boats and accompany the ceremony.

Both celebrations of blessing have the same five readings: Is. 35 (springs break forth in the wilderness); Is. 55:1–5 (Come, all you who thirst, come to the water!); Is. 12:1–6 (we will draw water from the springs of salvation); 1 Cor. 10:1–4 (all drank the same spirit-given drink); Mk. 1:9–11 (Jesus' baptism). The three Isaiah texts in particular offer rich impulses from Creation theology that can be well related to questions of environmental responsibility.

The prayer of blessing over water begins with a long anamnesis of the creation of the world. This makes it clear: it is Creation that praises God, not humanity alone. It is this Creation that God takes into service to heal humanity (Nicholas Denysenko 2019, 285). However, it is time for the prayer of blessing to also remind people of their responsibility to be stewards of Creation. This would require an appropriate addition (Nicholas Denysenko 2019, 302–303).

After his election as abbot of the Benedictine Abbey of Niederaltaich in 1989, Emmanuel Jungclaussen (1927 Frankfurt/ Oder–2018 Niederaltaich) made a lasting commitment to the free-flowing Danube between Straubing and Vilshofen. Inspired by the Eastern Church tradition, he went down to the Danube every year on 6 January and blessed the last piece of untouched river landscape between Ulm and the Danube delta. Thousands of people took part in these celebrations. In 2008, he received the Bavarian Nature Conservation Award for this from the Bund Naturschutz in Bavaria. Five years later, his commitment was successful: the Bavarian state government withdrew the project to expand the Danube near Niederaltaich.

4.5.4 Blessing of the animals

The Benedictionale for the German-speaking world from 1981 offers a blessing of animals under No. 78. Such animal blessings have been attested

to since the 4th century but were only included in the *Rituale Romanum* in 1874 (Florian Kluger 2011, 259–260). Even there, animal blessings "are to be counted among the category of invocative material benedictions." (Florian Kluger 2011, Appendix on CD-ROM, 67). This is not about animals as fellow creatures and living beings, but about animals as (material) possessions of humans. This is also reflected in the structure of the German *Benedictionale* of 1981, where the blessing of animals has its place under the chapter "Work and Occupation" and is placed between the blessing of restaurants and the blessing of machines.

Nevertheless, the 1981 *Benedictional* for the German-speaking world, in marked contrast to the current *Rituale Romanum*, emphasises human responsibility for animals with great clarity (Florian Kluger 2011, 274). Thus, as early as in the introduction it says: "Man has responsibility towards all living beings, especially towards the domestic animals that live with him and help him earn a living." Biocentric texts from the Old Testament—there would hardly have been any others—are offered as readings throughout: The creation and naming of animals (Gen. 2:19–20a), the rescue of animals by Noah (Gen. 8:15–19), the creation and blessing of animals (Gen. 1:24–25, 30–31) or the diversity of animals (Ps. 104:20–22, 24–30). And the prayer of blessing formulates: "You have entrusted your creation to man... You have given it into man's hand that he may use it and thank you for it... protect these animals... So they may help man and be a joy to him." Finally, the litany, with its invocation of the holy animal patrons, contains the petitions, "Help us to respect animals as fellow creatures" and "Create for us joy in the animals you have created." The German-language *Benedictional* is thus much more moderate in its anthropocentrism. It also consciously addresses human responsibility for and joy in animals (Florian Kluger 2011, 277–278). Finally, at least in the readings, it opens the view to a biocentric expansion of perspective.

In recent years, animal blessings have experienced a rebirth: in St. Peter's Square in Rome on the feast of St. Anthony, the father of monks, who is venerated as the patron saint of animals in the Romance-speaking countries; in St. Stephen's Square in Vienna on the feast of St. Francis of Assisi; and at many pilgrimage churches of St. Leonhard on his name day. Whether horses or cattle, budgies or dogs: people seek blessings for their animals.

4.5.5 Blessing in the killing of animals. A missing person report

An agricultural sociological study shows how farmers in small family farms perceived the mass culling of their cattle during the BSE crisis in 2001 (Karin Jürgens 2008, 41–56). They experienced the culling, which took place directly on their farms, completely differently from the normal slaughter of their animals. Even their choice of words shows a completely different ethical assessment: instead of "slaughtering" they speak of "killing", "making dead", "beating to death", "slaying", "butchering", "murdering". It is clear from their descriptions that they have internalised the classical Christian ethos that permits the killing of animals only for food. What they also experience as painful is that due to the rapid mass culling, the usual farewell rituals were hardly possible, such as an extra dose of food, a last grooming, the last body care and the verbal farewell to the animal to be culled. Not infrequently, they would have wished for the support of a priest.

Karin Jürgens' research clearly shows how ritualised the slaughtering process was in small-scale farming and still is in some cases on small family farms. Hunting also has a rich repertoire of rituals surrounding the killing of animals (Michael Rosenberger 2008 and 2015, 214–216). Rituals signal precarious life situations. They help to cope with and process them in a responsible way. That the killing of an animal is an extremely precarious situation has been known to humans from the beginning.

For this reason, *Judaism* has developed a ritual for the process of killing animals that is still sacred today: the ritual slaughter (cf. on the following Michael Rosenberger 2019). The blood, the lifeblood of the animal, may not be consumed (Gen. 9:4) and must flow out completely during slaughter. It belongs to the animal alone—not even to God may the blood be offered. In this respect, the ritual of slaughter signals that the animal must not be exploited to the last drop of blood. It has a dignity that must not be taken away from it despite the killing. The ritual of slaughter is thus an expression of respect for the animal as a creature loved by God and, at the same time, admonishes us to deal with it in an ethically responsible manner.

Today's practice of Jewish slaughter, which is mainly based on the tractate Chullin 1–2 of the Talmud, reflects this well: The butcher must be qualified and ethically blameless like a rabbi; he must slaughter consciously and attentively. The preparatory fixing of the animal is important. This was originally done with ropes, but is done today with different, often very elaborate and (at least seen from the outside perspective) special sophisticated

apparatuses, since the animal must be positioned in such a way to allow it to bleed out completely. A prayer of blessing is said over the animal. No automated apparatus may be used for the actual slaughter. The slaughterer must make a single, uninterrupted, rapid cut through all the soft tissues of the neck with an absolutely sharp blade. Only the spinal column remains unsevered. The sharpness of the blade must be checked beforehand for each individual slaughter.

Islam has adopted the Jewish practice as far as possible. "Halal", i.e. permitted, is the consumption of meat under two conditions: when the complete bleeding out of the animal is ensured (Sura 5:3) and when the name of God has been proclaimed over the animal (Sura 5:3; 22:28, 34–37). As in the Torah, there is no information on the technique of slaughter in the Koran, but there is in the Hadith, the traditional Islamic literature. For German Muslims, an authorised working group of all Muslim organisations laid down the following as a binding rule in 1988 (Axel Ayyub Köhler 1996, 145): An animal may not watch another being slaughtered; the animal may not be completely tied up when slaughtered; it must be watered, fed and calmed down beforehand; the slaughterer says a prayer over the animal facing in the direction of Mecca; the cut with a very sharp knife, freshly sharpened immediately beforehand, must sever the carotid artery and windpipe immediately so that death occurs as quickly as possible and the animal's suffering is kept to a minimum.

The detachment of *Christianity* from the prohibition of slaughter in the (early) Jewish mother religion was very laborious, but radical. In the New Testament we still find evidence that the Old Testament prohibition of the consumption of blood is one of those directives that do not seem to be applicable to Jewish Christians and must therefore also be imposed on Gentile Christians (Acts 15:20). Paul, however, does not agree with this. The Letter to the Romans testifies that for him eating unkosher meat is not a reprehensible act but is possible in the freedom of the gospel (Rom. 14:14). The young church's option for the mission to the Gentiles therefore leads to the abolition of Jewish slaughter regulations within a few generations. Christian slaughter is thus at least formally profaned—an understandable step in view of the historical situation, but one with serious consequences. Even today, its negative consequences for the Christian attitude towards animals can only be guessed at in outline. The Church unwittingly relinquished its influence on the slaughter of animals. The survival of slaughter rituals on family farms and in hunting proves that people have come of age here and are able to bring about meaningful rituals without the support of theology and the official Church. It is time

to reflect on these from a liturgical and scientific point of view and to recognise them in the official Church.

4.6 *As the church "do not remain silent". Creation Day and Creation Time*

In 1988, the participants in an ecological congress of Greek Orthodoxy on Patmos asked their patriarch to establish a liturgical day to commemorate the care of Creation (cf. on the following Bert Groen 2019, 307–332). The Synod of the Greek Orthodox Church in Istanbul in 1989 affirmed this concern and established the beginning of the Orthodox Church year, 1 September, as "Creation Day". To announce it, Patriarch Dimitrios I. Papadopoulos (1972–1991) addresses a message to the faithful, saying: "The abuse by contemporary man of his privileged position in creation and of the Creator's mandate 'to have dominion over the earth' (Gen. 1:28) has already led the world to the edge of apocalyptic self-destruction, either in the form of natural pollution which is dangerous for all living beings, or in the form of the extinction of many species of the animal and plant world, or in various other forms. Scientists and others learned individuals are now warning us of the danger and speak of phenomena which are threatening the life of our planet, such as the so called 'phenomenon of the greenhouse' whose first indications have already been noted. In view of this situation the Church of Christ cannot remain unmoved." (Ecumenical Patriarchate 1989).

In 1989, even before the UN Conference on Environment and Development (UNCED) in Rio in 1992, these are words that made people sit up and take notice. And so the "Day of Creation" gradually spread further and further. In Greek Orthodoxy, Patriarch Bartholomew I Archontonis (1991 to the present) is continuing his predecessor's initiative with great commitment. At his suggestion, the Second European Ecumenical Assembly in Graz in 1997 proposed that this festival be adopted in all Christian churches. Ecumenical groups in particular did so shortly afterwards. But the large churches and their leaders still need almost twenty years before they follow suit: Since 2015, the Russian Orthodox Church has celebrated Creation Day on the first Sunday in September. And also in 2015, Pope Francis adopted 1 September for the Roman Catholic Church.

In contrast, the Third European Ecumenical Assembly in Sibiu in 2007 pleaded for a longer Creation Time from 1 September to the feast of Francis of Assisi on 4 October. Within this time, the churches should place an emphasis on both liturgy and educational work. The liturgical Day of

4. Celebrating Creation. Liturgical expressions of care for Creation

Creation can then be determined according to local circumstances. The period was deliberately defined in such a way that in most Central European countries the harvest thanksgiving festival is included in it. This makes it possible to combine Creation Day with the traditionally important harvest thanksgiving festival on the one hand and to celebrate it on a Sunday on the other. However, a Creation Time that is over a month long naturally runs the risk of no Creation Day being celebrated, neither on 1 September nor on Thanksgiving Day nor on St. Francis Day.

Is such a Creation Sunday to be rejected as a "Sunday of purpose", as Winfried Haunerland (2000, 257) does? It is certainly true that a purpose, however good, must not be the primary, dominant motive of a liturgical celebration. Liturgy is first and foremost not a "moral institution". So, Creation Day should not be established so that the Church has something to show for environmental protection. But as an expression of its faith in God the Creator, which does not take centre stage on any of the classical feast days of the church year, a Day of Creation is urgently called for. And of course, responsibility for Creation will then have to be addressed on this day, as Patriarch Dimitrios already demanded in 1989.

Basically, a creation time or day is about perceiving and interpreting a sign of the times (GS 4). If, on the one hand, the liturgy is to be the "culmination and source" of church life (SC 10) and, on the other hand, responsibility for Creation is not a secondary aspect of the Gospel (LS 217), then the theme needs at least one day in the church year on which it is the focus of celebration, prayer and proclamation. In this respect, I interpret Haunerland's reserve rather as a warning not to "make" such a day at a desk and then stamp it out of the ground by force, but to broaden and deepen an accepted and evolved festival in the church year in terms of Creation theology. In the Eastern Churches, this can be the beginning of the church year, and in the West it can be Thanksgiving or the Feast of St. Francis. None of these festivals is done violence to by focussing on the endangered creation and our responsibility for it. On the contrary, ancient church festivals need to be linked to the great social challenges of the present in order to remain alive and young. Patriarch Dimitrios' initiative in 1989 hits the mark here.

4.7 Celebrating outdoors. Creation as a space and time-giver for the liturgy

Wherever services are currently offered in the great outdoors, they experience high numbers of participants. This is true for outdoor services such

as May devotions in one's own meadow and mountain masses in the mountains, which are held in one location, but also for processions and pilgrimages that are mobile and cover a shorter or longer distance through nature. Many dioceses in the Alpine region have set up their own websites where you can find information about all the mountain masses in the diocese. And the number of pilgrimage routes has been increasing steadily for thirty years—a boom whose end is not yet in sight. The desire for masses in the countryside is also growing, even if the motives are not always spiritual. Nevertheless, it is probably a genuine need of the people. In times when almost all of their everyday life is far from nature, they are looking for closeness to nature in the spiritual realm and want to experience God there.

In principle, this is not a new option. For centuries, wayside shrines and crosses, small chapels by the wayside and on mountain tops have been evidence that the whole of Creation was understood as a place of encounter with God and of worship. But the industrialisation and mechanisation of the modern age has considerably intensified this trend. In this respect, in conversations with believers, the burden of proof is increasingly reversed: it is not the question of why we should go out of the church into nature for a service of worship that is considered to require justification, but why we should normally go inside the church for worship and withdraw from God's creation, as it were: "Why do we generally retreat indoors for worship?" (Scott M. Kershner 2017, 42). In winter and bad weather, this question is unnecessary. But in beautiful, warm summer weather, the answer is not so evident.

In itself, the question is ancient—in Israel it has long been felt that man must justify himself if he wants to build God a solid, closed house: "Thus says the LORD: Heaven is my throne, and the earth is the footstool for my feet. What kind of house would you build for me? What place is this that is my rest? All these things have my hand made, and so all these things have become, saith the LORD." (Is. 66:1–2). So, for theological reasons, the great outdoors should become a place of worship much more often. On the one hand, where Creation can be experienced in all its splendour: "in various natural environments where bestowal of beauty and resources are evident" (Mary E. McGann 2012, 53). But also where it is threatened or destroyed: "in natural settings where degradation is evident" (Mary E. McGann 2012, 55). Think of petition services in front of nuclear power plants or along new motorway routes, lignite mining or a threatened watercourse like the Danube near Niederaltaich (see above chapter 4.5.3).

Where possible, church buildings should also connect with the Creation around them: Be it through large windows looking out into a beautiful landscape, be it through open windows and doors so that the singing of the birds and the blowing of the wind can be heard and felt inside the church. "The architecture of our worship spaces, rather than contain us within a space apart, must invite us to a sense of living, active communion with the natural world." (Mary E. McGann 2012, 57)

Creation is not only the largest and most beautiful church space built for us by the divine architect seen in medieval depictions of Creation, but also the best *zeitgeber*. Until the invention of mechanical clockwork, the main prayer times of the Liturgy of the Hours were determined by the rising or setting of the sun (cf. chapter 4.3.2). This enabled those praying to have a holistic experience at the transition from day to night and from night to day. The Easter Gospels stress with great emphasis that the women "went to the tomb early in the morning, just as the sun was rising" (Mk. 16:2)—"at the dawn of the first day of the week" (Mt. 28:1), "early in the morning" (Lk. 24:1) or "early in the morning, while it was still dark" (Jn. 20:1). This strong emphasis on the time of dawn reflects the custom at that time of celebrating a short service early on Sunday morning, which was then a working day, while the Sunday Eucharist took place after work (Lk. 24:36–49; Jn. 20:19–29).

In contrast to Judaism and Islam, which to this day set their times of worship according to the sun and thus differ from place to place and from day to day, Christianity allowed itself to be overwhelmed by the introduction of the mechanical clock in the 14th century—indeed, it even pushed it forward, for the first clock machines were largely located in churches and on church towers. The only sun-dependent times of worship that remain official are the Christmas Mass and Easter Vigil, for which a beginning in complete darkness is prescribed. It should not be surprising that such a rule seems strange and is disregarded in a religion that otherwise does not care about the position of the sun all year round.

What on the one hand can be seen as emancipation from the constraints of nature is on the other hand a form of alienation. For the biorhythm of animals and humans is based on the sun and daylight—the inner clock is reset every morning with the first daylight, and physical and mental performance go through several cycles in the course of the solar day. It corresponds to the creatures to live with the course of the light and to act accordingly—even if one does not demonise artificial light like some theologians of the 18th and 19th centuries. It is not for nothing that the old Christian churches were all oriented towards the east. During the morning

service, people wanted to look in the direction of the rising sun because in it they recognised Christ, the Sun of Righteousness. Romanesque churches were often even built in such a way that on a certain day, usually Easter Day, the light fell exactly on the altar through the eastern apse window during the mass. In other words, church architecture was also sun-related.

The fact that the biblical Creation mandate from Gen. 1–2 could be misunderstood in modern times in the way that Lynn White notes and associates with Western Christianity may have much more to do with this decoupling of worship times (and thus, of course, working times) from the natural rhythms of the sun than he thinks. Whoever wants to master Creation must master time. In Eastern Europe, the mechanical clock spread much later than in the West.

4.8 *Still room for improvement. A conclusion*

At the Franciscan School of Theology in Berkeley, California, there has been a dedicated course on "Ecology and Liturgy" for over a decade (Mary E. McGann 2012). According to the encyclical *Laudato si'*, such a course should become a compulsory part of every theology course. Especially when revising and updating liturgical books, care should be taken to ensure that those entrusted with this important task are trained in this area and have a good sense of Creation spirituality. For ecology and liturgy, creation ethics and liturgical science are still largely two separate worlds. This corresponds neither to their origin nor to their potential. We should use this room for improvement!

5. Respecting the dignity of creatures. Basic concepts of environmental and animal ethics

"Since its explicit beginnings, the environmental ethics discussion has been marked by the opposition of two main currents, the anthropocentric and the non-anthropocentric approaches.... They indeed discern the spirits." (Hans J. Münk 1997, 17) This sentence, which is already a quarter of a century old, still applies unchanged. A consensual solution to the basic question of environmental ethics is still not in sight half a century after it began. The differences of opinion are too fundamental. However, they can be narrowed down to one of three question perspectives, and this is what we shall do before we analyse the controversial approaches individually. For it is now clear in all the language families accessible to me that one must distinguish between three perspectives (cf. for the German language area first Gotthard M. Teutsch 1987, 16–18 and Bernhard Irrgang 1992, 17):

The *epistemological, methodological or epistemic perspective* asks what standards are available to humans for environmental ethical judgements¹⁰. Here, it is completely undisputed that it is only possible for them to look at the world with their human imaginative capabilities. They can expand these imaginative capabilities through technical aids, but not in principle leave them behind. For example, many animals emit sounds that humans cannot hear. However, humans can measure them by means of sonography and in this way make them accessible. Some animals also have sensory organs that humans do not possess, such as sensitivity to the earth's magnetic field, which they use for orientation. Here, too, measuring devices can replace the lack of human senses. In this respect, human perception of the world around us has expanded enormously in recent decades.

10 Some speak of anthroporelationality (e.g. Hans J. Münk 1998, 231–245 and Markus Vogt 2009, 258–259)—but without defining exactly what is meant normatively by it and what derivations result from it. Münk and Vogt suggest that they understand the term and the concept behind it as an alternative and "compromise formula" (Markus Vogt 2009, 258) to teleological anthropocentrism. However, from everything I read there, it seems to me that this could rather be a refinement of methodological anthropocentrism.

At the same time, this perception remains trapped in principle by the human capacity for cognition. For even if we draw valid (!) conclusions about the subjective feelings of animals and plants through their behaviour, we will never truly be able to feel "what it is like to be a bat"—the title of Thomas Nagel's famous essay in 1974. In other words: humans recognise the world methodically anthropocentrically, dogs methodically cynocentrically and bees methodically melissacentrically¹¹. Nevertheless, certain animals, like humans, have a high capacity for empathy across species. The similarities in the structure and functioning of the brain cause similarities in gestures, facial expressions and behaviour, so that these, in turn, allow conclusions to be drawn about inner experience per analogiam. In order to compensate for the weaknesses of *methodological or epistemological anthropocentrism*¹², the greatest possible development of the ability to empathise and think along, i.e. to put oneself in the shoes of another species, is required. And yet limits remain.

The inescapability of methodological anthropocentrism has an immediate ethical consequence: it requires great humility. For in view of the relativity of the human perspective of knowledge, it is important to avoid any arrogance that expresses itself in the belief that humans know how nature works and what needs to be done to protect the environment and our fellow human beings. If we do not even know "what it is like to be a bat", then it is not humans' place to elevate themselves above animals and plants. Environmental ethical decisions that we make are always subject to the limited perspective of knowledge that we humans are given.

The second, *formal perspective* asks who can take what responsibility for their actions and whether one should speak of responsibility at all in the case of non-human animals. This second question is increasingly answered in the affirmative in research, at least for certain animal species (Fiona Probyn-Rapsey 2018, 49). However, this is never about the immense re-

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- 11 The idea of a species-specific epistemic limitation is already found in the reflections by Xenophanes (born between 580 and 570 BC) that if animals had hands, lions would make lion-like and oxen ox-like images of gods (Hermann Diels (ed.) / Walther Kranz (ed.) 1972–1975, 21 B 15/16), and in a poem attributed to Epicharmos (c. 540–460 B.C.) that dogs find other dogs most beautiful, donkeys other donkeys, pigs other pigs and indeed humans other humans (Hermann Diels (ed.) / Walther Kranz (ed.) 1972–1975, 23 B 5). Cf. Urs Dierauer 1977, 62.
- 12 Angelika Krebs 1997, 342–343 calls methodological anthropocentrism "metaethical anthropocentrism". The adjective can be used appropriately, the noun, on the other hand, disregards, as is so often the case, the distinction between anthropocentrism and anthropocentrism, which is justified on the following pages.

sponsibility that is to be negotiated in this book, namely the responsibility for the survival of the biosphere as a whole. It should be indisputable that only humans possess this ability to some extent. Man is the addressee of environmental ethical demands—and he alone.

Again, there is the danger of drawing wrong conclusions from this special position of man. In connection with the image of God in Gen. 1, we saw where such uncovered conclusions can lead. While the image of God there describes only *formal anthropocentrism*, in later centuries the term was read as an answer to the third question perspective, and material anthropocentrism was derived from it. From this historical fact, many American Creation ethicists conclude that one should abandon the concept of the image of God as well as its modern translation with "stewardship". Of course, this would be possible in principle, but it would in no way escape formal anthropocentrism. It would only be a matter of cosmetics and semantics, not of hard content. I would therefore rather ask how a more effective firewall can be drawn between formal anthropocentrism and material anthropocentrism.

Finally, the third, *material or teleological perspective* already mentioned asks for whom the earth is to be preserved: Who are the *teloi*, the (self-)ends, for the sake of which the means of nature may and should be used? Is it only human beings, as anthropocentrism claims? Is it all sentient, pain-sensing living beings, as pathocentrism or sentientism holds? Is it all living beings, as biocentrism postulates? Or is it living beings and inorganic matter, even collective entities such as ecosystems and species, as ecocentrism or holism would say? This will be explored in the following. It is the crucial question of environmental ethics par excellence, and it is not as trivial as one might think.

First of all, it is clear that all four teleological determinations are compatible with both methodological and formal anthropocentrism, indeed that all four usually affirm both of these. For no matter which teleological determination we choose, we do it as human beings and thus methodologically and formally anthropocentrically. Hence, biocentrism, for example, emphasises the formal special position of human beings associated with their unique responsibility (Friedo Ricken 1987, 20; Hans J. Münk 1997, 26). It also methodically recognises that humans make environmental ethical value judgements according to human standards (Paul W. Taylor 1981, 204; Hans J. Münk 1997, 26). The same is true of ecocentrism (J. Baird Callicott 2017, 116; Helen Kopnina 2019, 4). Conversely, material anthropocentrism cannot necessarily be derived from the fact that humans are the only responsible parties and that they can only judge according to

their standards of knowledge (Tim Hayward 1997, 49; Gavin Rae 2014, 7). The three perspectives must therefore be kept neatly apart and have no substantive nexus that would allow one to be derived from the other.

For the sake of this clear distinction between the three perspectives, I must at this point say a few sentences about the *terminology*: Starting from the Anglo-Saxon area, it has become common in the last ten or fifteen years in the German and Romance language areas to speak of "anthropocentrism" when referring to the teleological question. I think this is a factually correct and appropriate development because the actual ideological positioning of anthropocentrism is linked to the teleological question—and semantically we traditionally designate ideologies with the suffix "-ism" and "-ist".

However, "anthropocentrism" and the usually combined "anthropocentric" do not fit together semantically. Purely linguistically, the adjective "anthropocentric" belongs to the noun "anthropocentrism"—which is unfortunately not at all the case in English-language research literature. Conversely, the adjective "anthropocentric" corresponds with the noun "anthropocentric", just as, for example, the adjective "ethical" corresponds with the noun "ethics". For linguistically, the suffix "-ism" denotes a world view, an ideology, whereas the suffix "-ic"—derived from the associated Greek adjective—denotes a method or approach (ethics, physics, logic...).

Consequently, a linguistically correct distinction must be made between moral, material or teleological anthropocentrism (with the adjective anthropocentrist or anthropocentric) on the one hand and formal anthropocentric and epistemic anthropocentric (both with the adjective anthropocentric) on the other (cf. Rob Boddice 2011, 13). This then makes it clear linguistically that no compelling conclusion leads from formal or epistemic anthropocentric to material anthropocentrism. The firewall between the first two and the third perspective is also linguistically clearly marked. This is exactly how I use the terminology in this book. Material anthropocentrism can then also be referred to more briefly simply as anthropocentrism. Anthropocentric, on the other hand, always requires specification by an adjective so that it is clear which perspective we are referring to. Where I quote, however, I must leave the terminology of the source quoted. Here, the reader's ability to recognise the possible terminological incongruence between the source and my commentary is then called for.

For me, it is a prerequisite that the designation of a teleological definition with an "-ism" only contains a description and in no way a valu-

ation—neither positive nor negative¹³. This is by no means self-evident because in social debates "-isms" are often accompanied by devaluations—just think of Islamism, racism or anti-Semitism. Those "-isms", on the other hand, which are used in a non-judgemental way, are currently hardly present in public debates. This can lead to prejudice in one direction or another, and this is how I interpret the tendency of some environmental ethicists who explicitly emphasise that they are material or teleological "anthropocentrics", but not "anthropocentrists". Here, a semantic trick is used that cannot be justified linguistically and should therefore be avoided. Those who advocate anthropocentrist teleology should unabashedly call themselves anthropocentrists. There is no shame in it.

In the following, I go through the four classical justificatory approaches of environmental and animal ethics one after the other—starting with the approach with the smallest scope and ending with the one with the largest scope. All four chafe most at the question of whether and, if so, to whom an "inherent value" or "dignity" must be ascribed. Only after discussing this question can a definitive decision be made as to which of the four approaches to justification has the highest internal consistency and reality-based adequacy.

5.1 *Anthropocentric approaches*

For whom is the life house of the earth to be preserved? Who are the *teloi*, the (self-)ends, for the sake of whom or which the means of nature may and should be used? That is the core question to be negotiated here. Anthropocentrism answers it thus: Only human beings have moral status and deserve moral consideration for their own sake. All other entities are mere means to rational human ends (J. Baird Callicott 2006, 119). Or, as Gavin Rae puts it: Anthropocentrism is "the ethical understanding which claims that the human's privileged status over the nonhuman (animals, plants, minerals, and so on) means that the human is free to use these non-

13 Lori Gruen 2015, 24 distinguishes between "inevitable anthropocentrism", by which she designates methodological anthropocentrism, and "arrogant anthropocentrism", which in our terminology is material or teleological anthropocentrism. In contrast to my proposal, she has thus integrated a direct valuation into the terms—not through the noun "anthropocentrism", however, but through the two assigned adjectives. I, on the other hand, would like to separate description and valuation conceptually, which is why I do not adopt Gruen's terminology.

humans to achieve its ends." (Gavin Rae 2014, 3; see also Helen Kopnina et al. 2018, 109).

Non-human entities therefore have their value solely in relation to humans, be it aesthetic or functional (as a use value). Nature is only worth protecting to the extent that it is "useful" in a well-understood sense to people living at present or in the future. Man's responsibility for nature is therefore understood exclusively as the responsibility towards his own kind. The inclusion of future (human) generations is its inherent component and removes the possibility of ruthless overexploitation of nature from anthropocentrism. Truly ethical anthropocentrism therefore demands the renunciation of consumption and power where this is necessary to protect nature and its foundations. But this is only necessary for the sake of preserving humanity. In this respect, anthropocentrism as an ethical concept is unquestionably advantageous because the traditional ethical rules and patterns of argumentation remain applicable (Tim Hayward 1997, 60–61).

Would the world be worth preserving if humanity were certain to die out? Consistent, hard anthropocentrism would have to give 'no' as an answer. Dieter Birnbacher, who did so in 1980, corrected himself a few years later¹⁴. However, while Birnbacher's positioning was of a fundamental nature and meant a "system change" from anthropocentrism to pathocentrism, many anthropocentrists have only carried out inner-systemic weakening of such particularly hard theses. Contemporary anthropocentrism therefore often appears in the form of "ecological humanism" and argues that human beings would deny their innermost being, their destiny to morality, if they abused nature. Taking ecological responsibility is an indispensable part of the realisation of humanity. Thus, Bernhard Irrgang seeks "ecologically oriented humanity as a horizon for weighing up... ecologically oriented humanity" (Bernhard Irrgang 1992, 67; similarly Markus Vogt 2009, 256–257 and 2016, 138). Its goal is an "appropriate consideration of living beings and nature in a weighing of goods" (Bernhard Irrgang 1992, 66). From this, Irrgang develops a model of graduated solidarity of humans with nature (Bernhard Irrgang 1992, 70).

14 Dieter Birnbacher 1980, 132. On the other hand, Dieter Birnbacher 1988, 86 comes to the opposite conclusion: "Should humanity one day irrevocably turn into a pack of animal-cruel sadists, it would be better, seen in the totality of beings capable of suffering, if humanity were to die out and leave the higher animals to themselves unimpaired."

The argumentation of anthropocentrists in the Anglo-Saxon world is not much different. Bryan G. Norton emphasises that weak anthropocentrism subjects perceived human preferences to a rational critique but does not need to invoke an "intrinsic value" of non-human entities: "such an ideal need not attribute intrinsic value to natural objects, nor need the prohibitions implied by it be justified with nonanthropocentric reasoning attributing intrinsic value to nonhuman natural objects. Rather, they can be justified as being implied by the ideal of harmony with nature. This ideal, in turn, can be justified either on religious grounds referring to human spiritual development or as being a fitting part of a rationally defensible world view." (Bryan G. Norton 1984, 136). Thus, according to Norton, an ideal of harmony with nature is sufficient, and this can be justified both on religious and rational grounds. The values derived from this ideal are purely human, but not egoistic: the protection of other living beings is only for the sake of humans, but is nevertheless effective (Bryan G. Norton 1984, 137). In this context, Norton believes that it is not the distinction between anthropocentrism and non-anthropocentrism that is decisive, but the distinction between moral individualism and moral non-individualism (Bryan G. Norton 1984, 133). The greatest challenge is the resolution of conflicts between (human) individuals and the human community as a collective (cf. chapter 5.6). However, this challenge can be overcome with human reason.

The question is, however, whether there is really a substantial difference between the new "soft" and the classical "hard" anthropocentrism and what exactly this difference would be. Norton, at least, would have to answer Birnbacher's question of whether the preservation of the earth would be morally imperative if humanity were to safely die out in the negative. Irrgang leaves his answer up in the air. But what does he want to use to determine the "appropriateness" of taking living beings and nature into account when weighing up goods? This is where soft anthropocentrism comes to a grinding halt. For ultimately, the question always ends up in the binary alternative of whether one derives the criteria for the appropriateness of taking non-human Creation into account from the Creation itself or whether one ultimately thinks of it in terms of human beings. The distinction between soft and hard anthropocentrism may make differences in terms of gestures and optics, but not in content.

Where are the *historical roots* of anthropocentrism? At the beginning of the debates on environmental ethics within the horizon of Christian theology, it was still thought that anthropocentrism could be derived from the biblical Creation narratives. Thus, one of the pioneers of Christian en-

vironmental ethics, Alfons Auer, drew the conclusion from Gen. 1–2 "that the whole of the rest of the world is ordered towards man alone as the highest work of Creation [...], in Gen. 2 towards man as the centre around which everything is built, in Gen. 1 as the apex of the pyramid erected by Creation." (Alfons Auer 1981, 69 and 1984, 220) A few years after Auer, such considerations were already obsolete. The apex or crowning of Gen. 1 is the work of Creation on the seventh day, that is, the Sabbath, the resting and breathing of Creation. And the centre of the garden in Gen. 2 is a tree and not man.

So, in defiance of Lynn White, we have to look outside the Bible to get to the origins of anthropocentrism in ancient Greek philosophy. A crucial preliminary stage is formulated by the *Sophists* (c. 450–380 BC), who first call animals *ἄλογα ζῷα* or simply *ἄλογα*—living beings without *logos*, without reason and without language, without culture and technology, without morality and law. Even though the evaluative and not merely descriptive term *aloga* only became common with Aristotle (Urs Dierauer 1977, 33), the distinction between humans and animals through reason is "one of the most momentous theses of the 5th century [BC, MR]" (Urs Dierauer 1977, 39). By the end of the century, it had gained acceptance and was widely acknowledged.

The breakthrough to hard anthropocentrism is made by *Socrates*, and he does so in order to substantiate the care of the gods for human beings: "Tell me, Euthydemus, has it ever occurred to you to think about the care with which the gods have arranged everything that human beings need?—No, indeed, not yet, replied the latter." (Xenophon, *Memorabilia* 4,3,3) Thereupon, Socrates explains how everything, really everything, is arranged for man and his benefit: light, sun and moon, earth, water and fire, the seasons and much more. But even after this long treatise, his interlocutor Euthydemus is more inclined towards biocentrism: "I, said Euthydemus, am already considering whether the gods do anything at all other than care for human beings; only one thing still causes me concern, that the other living beings also participate in these benefits.—Is it not clear, replied Socrates, that these also are created and brought up for the sake of men (καὶ τὰ ταῦτα ἀνθρώπων ἕνεκα γίνεταί τε καὶ ἀνατρέφεται)? For what other creature has so many advantages to enjoy from the goats, sheep, cattle, asses, and the rest of the animals, as man?" (Xenophon, *Memorabilia* 4,3,9–10). The fact that man can benefit from all animals is a decisive argument in favour of anthropocentrism for Socrates. However, this is motivated theologically: in the strict orientation of the world towards man, the care of the gods is shown in an unsurpassable way. The objection

of Euthydemus that the care of the gods could also apply to all living beings is not valid for Socrates, because only man possesses reason. Greek anthropocentrism only becomes plausible in the connection between the irrationality of animals and divine providence.

However, it is only in the *Stoa* that it is consistently developed and intensified: again, one of the two motifs is the theologically focused proof of the good providence of the gods. Thus, Cicero begins his thoughts on anthropocentrism in his treatise on the nature of the gods with the words: "It remains that at the end of my speech I finally show that everything in this world that men use was created and prepared for the sake of men." (Cicero, *De natura deorum* 2, 154). The second motif is from ethics or moral pedagogy: if man alone possesses reason, he is urged to use it in the right way. In terms of content, two main reasons are given for anthropocentrism: Firstly, everything earthly has a use for man, right down to the bedbugs that wake him up in the morning and the mice that admonish him to be careful with food. And secondly, the lower was created for the higher, the unreasonable for the reasonable: "The dogma of the creation of animals for the benefit of man stood and fell with the proof of the unreasonableness of animals." (Urs Dierauer 1977, 243)

Soon the mainstream of early Christian theology adopted the concepts and values of the mainstream of Greco-Roman philosophy, for a caring Creator was also believed in, and the strict teleology of the *Stoa* was very convenient for Christianity. In addition, it wanted to push back the doctrine of transmigration of souls, which was closely linked to the pro-creation and pro-animal position of Greek minority philosophy (Günther Lorenz 2013, 245). *Origen* (185 Alexandria–c. 254 Tyre), who in his writing "Against Kelsos" c. 240 AD deals, among other things, with the cosmocentrism of the now lost writing "True Doctrine" (Ἀληθὴς λόγος) by the Platonist Kelsos, which the latter wrote in Alexandria c. 180 AD, is paradigmatic for this transfer. Kelsos presents Christianity as an uneducated and socially isolating current and sees no reason for the assumption, which he already perceives as typically Christian, that the world was created for the sake of man. It could rather be argued that it exists for the sake of animals, for by nature, no single species is destined to dominate the world. Christian anthropocentrism is therefore mistaken, for the cosmos forms a totality in which each component has its equal significance (this is how Origen refers to Kelsos' position in *Contra Celsum* 4, 74–99). In his defence of Christian anthropocentrism, Origen then adopts the rationalist position of the *Stoa* and thus the philosophical mainstream of his time.

In this way, he is able to refute Kelsos' core thesis that Christianity is uneducated and apostatises.

The animal- and Creation-friendly, biocentric or cosmocentric minority position of Greek philosophy, as it lives on in Neoplatonism and Neo-Pythagoreanism, is also reflected in the growing church as a minority position. It is represented by early *monasticism*, whose adherents, for ethical and biblical (!) reasons, live a strictly vegetarian, partly even vegan life. This minority position is never lost in 2000 years of Church history, but always remains marginal.

To this day, anthropocentrism is the overpowering foundation of most human societies. It manifests itself invisibly in their institutions and rules and is in this way omnipresent (Fiona Probyn-Rapsey 2018, 48). Humans shape the entire earth according to their needs—non-anthropocentric views are tolerated at most in nature reserves and national parks. This is why proponents of the other justificatory approaches to environmental and animal ethics are calling for a new era of "post-anthropocentrism" or "post-humanism" (Helen Kopnina 2019, 2).

From its beginning in Greek antiquity, the *adequacy* of anthropocentrism in relation to reality was repeatedly questioned. On the one hand, people wondered whether the deep gulf between rational humans and irrational animals and plants was consistent with empirical observations. Since antiquity, there had been an abundance of observations on animal behaviour that did not seem to be justifiably explainable without recourse to deductive reasoning, category building and imageless reasoning. On the other hand, people wondered whether utility was as one-way as anthropocentrism claimed, namely that ultimately it was always the rest of Creation that benefited humans and not sometimes the other way around. Principled and majority-supporting questioning of anthropocentrism only began with Charles Darwin's theory of evolution and has not yet been fully realised even at the philosophical level.

A second enquiry into anthropocentrism is, as far as I can see, rather modern and doubts its *internal logical consistency*: to justify the demand for species-appropriate treatment of animals, which since Immanuel Kant has also been raised by most anthropocentrists, the appeal to humanity is not sufficient. Many of them therefore emphasise the importance of empathy. Humans must empathise with animals and draw from this the necessary consequences for their actions (Bernhard Irrgang 1992, 67–70; Wilhelm Korff 1997, 81). As was already the case with Immanuel Kant (Moral Philosophy Collins AA XXVII/1, 459), reasoning by analogy is demanded here, for empathy cannot do without analogy. However, it must then grant

the needs of animals an analogous value, but one that is independent of humans. Animal protection happens for the sake of the animals. Here, anthropocentrism cannot maintain its own approach.

Despite its long, almost 2500 years of dominance, the anthropocentric approach to reasoning has reached its fundamental limits. It has clearly lost its self-evidence in modern ethics. The question is, however, what should take its place?

5.2 Pathocentrist/ Sentientist approaches

"The day has been, I grieve to say in many places it is not yet past, in which the greater part of the species, under the denomination of slaves, have been treated by the law exactly upon the same footing as, in England for example, the inferior races of animals are still. The day may come, when the rest of the animal creation may acquire those rights which never could have been withholden from them but by the hand of tyranny. The French have already discovered that the blackness of the skin is no reason why a human being should be abandoned without redress to the caprice of a tormentor. It may come one day to be recognized, that the number of the legs, the villosity of the skin, or the termination of the os sacrum, are reasons equally insufficient for abandoning a sensitive being to the same fate. What else is it that should trace the insuperable line? Is it the faculty of reason, or, perhaps, the faculty of discourse? But a full-grown horse or dog is beyond comparison a more rational, as well as a more conversable animal, than an infant of a day, or a week, or even a month, old. But suppose the case were otherwise, what would it avail? The question is not, Can they reason? nor, Can they talk? but, Can they suffer?" (Jeremy Bentham 1828, vol. 2, 235–236)

In this programmatic footnote to the new edition of his main work from 1789, *Jeremy Bentham* (1748–1832 London) compares the liberation of animals with the abolition of slavery in 1828. The ban on the slave trade was passed in the United Kingdom in 1807, but the ban on slavery did not follow in England until 1833 and in the USA until 1865. This impressively demonstrates Bentham's foresight and prophetic power. And indeed, for the first time in 2200 years, he succeeds in shaking the Western dominance of anthropocentrism by attacking head-on the thesis of the Aloga, the reasonless and speechless animals, which had been taken for granted since the time of the Sophists: it is not at all decisive whether animals can think or speak, but whether they can suffer, i.e. feel pain and

pleasure. For modern animal protection, this paradigm shift can hardly be overestimated.

Bentham is the founder of utilitarian ethics. In the main work cited here, "An Introduction to the Principles of Morals and Legislation", he unfolds its four basic principles. The third is the "sentientist principle": the yardstick for the "utility" of an action is the happiness of all the individuals involved. Where an action promotes their happiness as a whole, it is "useful". Happiness, however, shows itself empirically through apparent pleasure and freedom from pain. Consequently, all beings that can feel pleasure and pain are morally relevant. These are all living beings that possess a nervous system, i.e. all animals. This is the meaning of the term "pathocentrism" or "sentientism": everything revolves around pleasure and pain.

Since Bentham, the representatives of utilitarianism have remained true to the sentientist principle. However, based on modern biological findings about the intelligence of some animal species, they add a supplement that grants additional rights to particularly intelligent animals. This is demonstrated by the most committed utilitarian in animal ethics today, the Australian philosopher *Peter Singer* (*1943 Melbourne). For most animals, Singer adheres to the sentientist principle. For him, all consciously felt interests are relevant, i.e. the interests of all sentient beings with a central nervous system (Peter Singer 1994², 84–85). However, Singer divides conscious interests into two groups: those that relate exclusively to the present and those that involve future expectations. The latter have creatures that plan into this future—and there are quite a few of these among both mammals and birds. Singer calls such living beings, whose interests are also oriented towards the future, "persons". His conclusion is obvious: there are people who are not persons because they never had or will have an expectation of the future, namely people with severe mental disabilities. And there are persons who are not humans, namely such animals in whom one must assume, on the basis of the results of behavioural research, a conscious thinking into the future (Peter Singer 1994², 119–120). According to Singer, such persons have an absolutely inviolable right to life because they cannot be replaced (Peter Singer 1994², 134 and 166). By killing them, one does injustice "to them personally", not only to the general public. For: "Very often [by killing a person, MR] everything the victim has endeavoured to do in the past days, months or even years is reduced to absurdity." (Peter Singer 1994², 129). Now, in traditional ethics, a person's life is violable when life is pitted against life—think of the legitimacy of self-defence killing. That is why Singer admits that the justification of his

protection of the life of persons, which goes far beyond all traditional ethics, "is an area where fully satisfactory answers have yet to be found." (Peter Singer 1994², 172)

Singer's provocation that not all humans should enjoy a right to life, but many intelligent animals should, is immense. This demand results in serious distortions of previous moral standards. Singer chooses animal protection at the expense of human protection—a highly questionable strategy. Moreover, it is only about animal protection of the most intelligent species. Animals that are not persons, because they cannot develop future concepts, can only hope for painless treatment—nothing more is provided for them. The "nasty ditch" between persons and non-persons is drawn differently than before, but it is not filled up.

Even more profound are the problems that utilitarianism buys into with its underlying epistemology. It follows empiricism, whose basic principle is that only empirically countable and weighable facts are valid. In such a model of thought, no human or animal individual can come into view as a unique, distinctive "personality", because such an attribution exceeds empirical data. This is why Peter Singer's concept of the person seems highly artificial and ultimately remains alien to his overall concept. *Tom Regan* (1938–2017 Pittsburgh) points this out in a very descriptive and pointed formulation: What has value for the utilitarian is the satisfaction of an individual's interests, not the individual himself (Tom Regan 2004⁴, 205–206). To illustrate his thesis, Regan chooses the comparison with a cup filled with liquid. From the utilitarian point of view, only the liquid has value, not the cup. From the point of view of traditional ethics, it is exactly the opposite: it is not the quantity of fulfilled interests, not the quantity of "happiness" that is the decisive yardstick for them, but the individual as a unique subject. Here, it becomes very clear how profound the differences are between traditional ethics and utilitarianism.

Tom Regan therefore tries to bring the sentientist option into traditional ethics. He ascribes an "inherent value" to certain living beings, which he explicitly describes as "more Catholic" in comparison with Albert Schweitzer's Protestant ethic of reverence for life (cf. chapter 5.3) (Tom Regan 2004⁴, 241). Living beings that have such inherent value matter as unique individuals. What matters is not their level of happiness, as in utilitarianism, but that they are themselves. And because they are unique and incomparable, inherent value cannot be measured. It is neither greater or smaller in one living being than in another, nor is it the same in all living beings, but it is simply "incommensurable", as one says in technical language, i.e. "immeasurable". Unlike the "intrinsic value" of experiences,

the "inherent value" of individuals is immeasurable, unearned and unlosable (Tom Regan 2004⁴, 235–237).

Now, according to Regan, which living beings have inherent value? They must be "subjects of a life", i.e. individuals with a long list of capacities, namely beliefs, desires, ideas, memories, sense of the future, emotional life, interests, intentions to act, psychological identity over long periods of time and their own well-being (Tom Regan 2004⁴, 243.153). With this long list, Regan sets the bar quite high for "subjects of a life", and he is well aware of that. It may be, he concedes, that living beings that are not subjects of a life also have inherent value. But it is difficult to justify this. Therefore, Regan wants the criterion of being the subject of a life to be understood as a sufficient, not a necessary criterion for the attribution of inherent value. Who then specifically counts as subjects of a life? For Regan, in a pragmatic approximation, these are mentally normal humans and mammals from the age of one year. Plants and "lower" animals, on the other hand, are not subjects of a life for him (Tom Regan 2004⁴, xvi. xl. 78).

In conclusion, let us look at what unites the three sentientist approaches of Bentham, Singer and Regan and question them in terms of their adequacy and consistency. In doing so, I will refrain from repeating Regan's justified and principled criticism of utilitarianism's blindness to individuals. This can be remedied in principle, as Regan shows with his own approach. Nevertheless, open questions remain.

As far as the *adequacy* of the sentientist approach is concerned, both Singer and Regan show that the sole appeal to sentience is no longer sufficient today. What might have been sufficient in Jeremy Bentham's time, that attention be paid to the avoidance of animal suffering and to increasing animal pleasure, proves insufficient against the background of modern biology. The particularly intelligent animals would be given too little credit in an exclusively pathocentric model. Therefore, both Singer with his person concept and Regan with his subjects of a life above pain-sensing beings try to establish a group of living beings endowed with more moral rights. Strictly speaking, they thus leave pathocentrism and supplement it with strongly human-oriented, albeit soft, "logocentrism".

Besides this nasty ditch "above" pain-sensing creatures, however, there is an equally nasty ditch "below" them. Plants that lack sensations of pleasure and pain are irrelevant in sentientist approaches. These approaches have done pioneering work for animal protection, but they can still do nothing with plants. Val Plumwood (2002, 258) rightly finds Peter Singer's "indifference to plant lives... deeply shocking".

That the *internal consistency* of sentientism is fragile is amply demonstrated by the repairs attempted by Singer and Regan. One could almost ask whether their two concepts can pass as "sentientist" at all. But how would they be alternatively classified? A second sore point of consistency concerns the poor justification of future expectations as Singer's criterion for persons and for Regan's long list of criteria for the subjects of a life. Measured against the enormous scope of these concepts, the arguments supporting them turn out to be decidedly meagre. Thus, a number of unresolved questions remain here as well.

5.3 Biocentric approaches

We are still at the question: For whom is the house of life on earth to be preserved? Who are the teloi, the (self-)ends, for the sake of whom or which the means of nature may and should be used? The starting point for biocentrist considerations is the observation that the earth as an ecosystem is a wholeness in which everything that exists is intertwined. Humans are members of this wholeness like all other living beings. In advance of any possible special position of man within Creation in the sense of formal anthropocentrism, which biocentrism certainly admits, man is first and even more originally integrated into nature and in this (!) respect equal to all living beings (Paul W. Taylor 1981, 206–207). Enlightened anthropocentrism cannot and will not deny this.

As a minority position, biocentrism already existed in antiquity. In its modern form, it goes back to *Albert Schweitzer* (1875 Kaysersberg/Alsace–1965 Lambaréné/Gabon), who developed a programmatic ethic of "reverence for life". The original experience that led him to this ethic occurred in September 1915, when he was travelling about 200 kilometres in a boat on the Ogowe River in Gabon. Schweitzer describes it like this: "In the evening of the third day, when we were near the village of Igendja at sunset, we had to sail along an island in the river, which was over a kilometre wide. On a sandbank to the left, four hippos with their young were wandering in the same direction as us. Then, in my great tiredness and despondency, I suddenly came across the word 'reverence for life', which, as far as I know, I had never heard and never read. Immediately I understood that it contained the solution to the problem I was struggling with. It dawned on me that ethics, which only has to do with our relationship to other people, is incomplete and therefore cannot possess complete energy. Only the ethics of reverence for life can do that. Through it we

come to relate not only to human beings but to all creatures within our reach and to be concerned with their fate in order to avoid harming them and to be determined to assist them in their need as far as we are able....

The fundamental fact of man's consciousness is: 'I am life that wants to live, in the midst of life that wants to live'. Man, who has become thinking, experiences the compulsion to show the same reverence for all will to live as he does for his own. He experiences the other life in his own. It is considered good to preserve life, to promote life, to bring developable life to its highest value. Evil: destroying life, damaging life, holding down developable life. This is the essential, universal, absolute basic principle of ethics. Ethics up to now has been imperfect because it thought it was only concerned with the behaviour of human beings towards human beings. In reality, however, it is a question of how human beings relate to all life within their sphere. He is ethical only if life as such is sacred to him, that of human beings and that of all creatures. "(Albert Schweitzer 1966, 20–22; also Albert Schweitzer 1970, 179–180).

In retrospect, in this text Schweitzer describes his turning away from the Kantian ethics that he had represented until then. This was classically anthropocentric. Now, however, he recognises that all living beings strive naturally to continue living. And he considers this fact to be ethically relevant: It is necessary to respect the living individual and its striving for self-preservation and to leave it untouched wherever possible. "Reverence for life" becomes his central term for this basic attitude. Of course, Schweitzer recognises that it is inevitable to take life in order to be able to live itself. But prior to the conflicts of life and possible trade-offs, all living beings are "moral patients", i.e. individuals who are morally relevant.

After returning from Gabon, Schweitzer tried to communicate his new ethics to wider circles. In his morning sermon on Sunday, 16 February 1919, he programmatically presented it in the church of St. Nicolai in Strasbourg, where he was working as a vicar at the time: "And if you immerse yourself in life, look with seeing eyes into the immense, animated chaos of this being, then suddenly you are seized like a dizziness. You find yourself in everything... Everywhere you see life—that is you! So what is recognition, the most learned as well as the most childlike: reverence for life, for the incomprehensible that confronts us in the universe, and that is like ourselves, different in outward appearance and yet inwardly of the same essence as us, terribly similar to us, terribly related to us. Abolition of the strangeness between us and the other beings... I cannot but have reverence for all that is called life, I cannot but sympathise with all that is called life: this is the beginning and foundation of all morality... Thou

shalt experience life and preserve life—this is the greatest commandment in its most elementary form." (Albert Schweitzer 2017, 1237–1238). Here, the equality and interconnectedness of all living beings is placed before the particularities of the human being—a trend-setting step for all subsequent biocentrists.

Schweitzer was far ahead of his time. Only in the context of the ecological crisis does biocentrism receive greater attention. The pioneer of this phase is *Paul W. Taylor* (1923–2015 New York). He characterised his "biocentric outlook" in four theses (Paul W. Taylor 1981, 206–207; Paul W. Taylor 1986¹ / 2011², 99–100):

- (1) As living beings, human beings are members of the community of life on earth in the same way ("in the same terms") as all non-human living beings.
- (2) The ecosystem earth is a network of reciprocal ecological relationships between all living beings.
- (3) Every organism is a "teleological centre of life". Its activities are directed towards self-preservation through space and time, even if not all living beings are aware of this. Thus, every living being has a unique "point of view", a perspective that only this living being can adopt. From this perspective, it has its own good ("good of its own"), something that is good for it (Paul W. Taylor¹ 1986/² 2011, 60) and is realised in the full development of its biological possibilities (Paul W. Taylor 1981, 199). The living being can evaluate subjectively, i.e. "perceive" the value of things in its environment for itself and use them or leave them unused. Ethically speaking, every living being is therefore a bearer of its own value ("inherent worth") and a moral patient. It has moral status ("moral standing a priori", Paul W. Taylor 1981, 199–201), which is why its goods must be respected and promoted by all moral agents as ultimate ends. Man should not anthropomorphise other living beings, but rather perceive and understand their point of view in order to gradually arrive at a holistic perception of all living beings and to take this into account in his actions. Taylor thus remains within the framework of classical moral individualism. What counts are individuals. Species, on the other hand, have their "own" good only through the aggregation of their members, and likewise biotic communities. Inanimate matter has no good of its own because it is not a teleological centre of life.
- (4) In the perspective of this inherent worth (!), human beings do not stand higher than other living beings. Taylor speaks of "biocentric equality". In contrast to price, inherent worth is not scalar, i.e. it is not

quantitatively higher or less high, but qualitatively the same. There is no superiority among individuals with inherent worth because each of them is not exclusively a means to the end of others (Paul W. Taylor¹ 1986/² 2011, 78–79). It is not arbitrarily available for the purposes of others, but is first and foremost unavailable: "The principle of intrinsic value states that, regardless of what kind of entity it is in other respects,... the realisation of its good is something *intrinsically* valuable... its good is *prima facie* worthy of being preserved or promoted as an end of itself." (Paul W. Taylor 1981, 201)

One notices how precisely Taylor follows the Kantian distinction between dignity and price here—with the only difference that he does not tie the granting of dignity to morality, but to the pursuit of self-preservation. Of course, Taylor argues, humans have some unique capacities. But some other animals have other unique capacities, and there is no reason at all why man's unique capacities should be more valuable than those of other animals. For humans themselves, they are, but for other creatures, other qualities are more valuable. It simply depends on the point of view. To derive a fundamental superiority from a unique ability would be a category error because superiority can only exist where two individuals have fundamentally identical, i.e. comparable abilities. Therefore, humans cannot be morally superior to other living beings, only to other human beings. The talk of man as an animal rationale in Greco-Roman essence ontology was a specification, not a statement of superiority. It is true that the *bonum hominis* is a rational life. But for (most) animals and plants it is not a good—so why should humans be superior to all animals and plants on the basis of their possession of reason?

Taylor also reflects on the thesis that the inherent worth of an animal or a plant might be less than that of a human being. If this were the case, it would mean that the goods of humans would always take precedence over the goods of other living beings. Non-human living beings would have a moral status, but it would always be lower than that of humans—what would it matter then? The inherent worth theorem therefore only makes sense if the inherent worth of all its bearers is qualitatively the same.

In the German-speaking world, no one has spoken out so resolutely in favour of the Taylorian approach as *Friedo Ricken* (1934 Rheine–2021 Krailling). With the aim of translating Taylor into the horizon of Kantian categories, he emphasises that an animal has two properties analogous to self-finality in the Kantian sense: "It is the subject of purposes and it has a practical self-relation. Both are given by its ability to feel pleasure and pain." (Friedo Ricken 1987, 8). For "lower" living beings, to which plea-

sure and pain cannot be attributed, Ricken nevertheless sees "needs" that are analogous to conscious "interests", since plants also seek to fulfil these needs (for light or water, for example) in a very purposeful way. Ricken refers to Aristotle, who assigns this striving to the vegetative soul faculty (Friedo Ricken 1987, 14–16; cf. Aristotle, *De anima* II 4, 415a25-b2). Plants, too, therefore, relate to themselves. Their organism is not only the result but also the cause of material accumulations of itself; moreover, it is the bearer of identity in all material exchange. In metabolism, therefore, something like "freedom" is shown in a very analogous way, says Ricken, referring to Hans Jonas (1973, 123). From these considerations, Ricken postulates direct duties towards living beings, for they have a moral status and are moral patients.

Recently, in the German-speaking world, *Angela Kallhoff* in particular has been pushing biocentrism, with a special focus on human interaction with plants. Plants, she argues, try to avoid stress and develop strategies to do so. They strive to flourish. In this context, flourishing means a species-appropriate and low-stress way of life (Angela Kallhoff 2007, 90). Respecting a plant then means avoiding damage to it wherever possible and promoting its flourishing. Both damage and promotion are empirically recognisable, demonstrable and distinguishable for humans. However, this initially results in a very modest demand: harm must be ethically reflected on and justified.

The *internal consistency* of biocentrism should be relatively high compared to anthropocentrism and pathocentrism. In contrast to these, moral status is not based on certain abilities, but on a relationship—membership in the earth's community—and a property—delimitable individuality with a practical self-relationship. Biocentrism is thus the only one of the previous approaches to justification that does not contain any speciesism.

Discussions therefore tend to develop around its *adequacy* (cf. Michael Bruckner/Angela Kallhoff 2018, 164–166): On the one hand, biocentrism has the greater, though not insurmountable, difficulty of taking the ability to feel pleasure and suffering and the ability to think into account in an ethically appropriate way. In principle, this can be solved by including them in the consideration of goods without giving up the equivalence of inherent worth, as classical anthropocentric ethics already does for different people (e.g. the mentally healthy and the demented). On the other hand, biocentrism is accused of being impracticable due to the inevitability of competition and the dependence of many living beings on organic food. But what at first glance seems like an insurmountable obstacle is, at second glance, the constant prerequisite for ethics. Ethical considerations

start with real, existing conflicts and competitive situations for scarce goods. John Rawls counts these among the indispensable "circumstances of justice" (John Rawls 1975, 148–152, § 22). A form of ethics that does not satisfactorily address the problems of competition and scarcity is not worthy of being called ethics. Not only must biocentrism be measured against this, but so must anthropocentrism.

5.4 *Ecocentrist/Cosmocentrist/Holistic Approaches*

The fourth and last major approach in environmental and animal ethics is ecocentrism or cosmocentrism or holism. This approach not only recognises intrinsic value in all living things, but also in species and ecosystems, as well as in inanimate matter: "Ecocentrism is the broadest term for worldviews that recognise intrinsic value in all lifeforms and ecosystems themselves, including their abiotic components." (Haydn Washington et al. 2017, 35)

Ecocentrism has been around as long as humans have existed (Haydn Washington et al. 2017, 35). It may have emerged in early human societies and is thus the oldest of the four approaches presented here. Its breakthrough in modern environmental ethics came from one of the pioneers of the environmental movement, the US forest scientist *Aldo Leopold* (1887 Burlington IA–1948 Baraboo WI). Leopold saw how the exclusively economically oriented forestry of his time was destroying the forest as a habitat. Behind their short-term utilitarian thinking, he identifies thinking in terms of ownership and property, which he traces back to the supposedly biblical view of nature, as does Lynn White, whom I quoted earlier: "Conservation is getting nowhere because it is incompatible with our Abrahamic concept of land. We abuse land because we regard it as a commodity belonging to us." (Aldo Leopold 1992, 18) Unlike Lynn White, however, Leopold also blames ancient Greece for anthropocentric possessiveness (Aldo Leopold 1992, 149–150). And he acknowledges the critical voices in the Bible: "Thinkers since the days of Ezekiel and Isaiah have argued that overexploitation of the land is not only unbeneficial but unjust. In the general public, however, this conviction has not yet prevailed." (Aldo Leopold 1992, 150). Unlike Lynn White, Leopold is not a historian, which is why one should not put his considerations in gold standard terms. But what they do demonstrate is that, for Leopold, the reification of nature and its consideration as a resource and a possession is at the root of the problem.

In 1935, during a visit to the Faculty of Forestry in Tharandt/Saxony, the place of origin of the idea of sustainable forestry (cf. chapter 6.1), Leopold became acquainted with an alternative form of forestry with individual logging and natural regeneration. Inspired by this, he developed his holistic land ethic after his return to the USA: "If, on the other hand, we see the earth as a totality to which we belong, perhaps we will succeed in treating our environment with more love and respect." (Aldo Leopold 1992, 18). Thinking in ecological contexts and wholes becomes crucial for Leopold: "All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. ... The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land." (Aldo Leopold 1992, 151). Although a forester, Leopold argues, at least cautiously, for the establishment of true wilderness areas that are not commercially exploited: "A land ethic of course cannot prevent the alteration, management, and use of these 'resources', but it does affirm their right to continued existence, and, at least in spots, their continued existence in a natural state." (Aldo Leopold 1992, 151) For his land ethic, Leopold formulates the following categorical principle: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." (Aldo Leopold 1992, 174) However, he did not succeed in systematically developing land ethics due to his early death.

Here, another pioneer of the modern environmental movement goes a step further: the Norwegian philosopher *Arne Næss* (1912 Slemdal near Oslo–2009 Oslo). In a scientific article published in 1973, he coined the term "deep ecology", which is still used today. Næss defines this precisely along the distinction between anthropocentrism and ecocentrism. In contrast to anthropocentric surface ecology, his deep ecology abandons the ontological human–environment dualism and replaces it with the paradigm of organisms as nodes in the biospheric network of intrinsic relations (Arne Næss 1973, 95). Relations are intrinsic when they must be understood as an indispensable part of the definition of entities. A being cannot be described without its relations. In this view, ontological dualisms do not get to the heart of the matter. A human being is not who they are without their environment.

Ethically, Næss first deduces a biocentric principle from this holistic view, which he calls "biospheric egalitarianism": all living beings have the same right to live and flourish ("equal right to live and blossom", Arne Næss 1973, 96). However, this principle is only *prima facie* valid because real life practice always experiences conflicts and necessitates some

killing, exploitation, and suppression: "any realistic praxis necessitates some killing, exploitation, and suppression." (Arne Næss 1973, 95) In this respect, there is a need for "population planning" for all living beings that is oriented towards the capacities of the ecosystem. Næss associates the term population planning with two very different levels of regulation: Population planning for humanity, which is done primarily through birth planning, and population planning for non-human living beings, which is done primarily through the killing of individuals. This is his holistic approach: the existence of the system as a whole takes precedence over the lives of individuals, including individual humans, because it is their livelihood.

In a later interview, Næss makes clear how much deep ecology depends on the paradigm shift to ecocentrism: "Deep ecology ... is a movement in which one not only does good for the planet in the interest of people, but also in the interest of the planet itself. That is, you look at the globe as a unit and you talk about the individual ecosystems, you try to keep them alive as a value in themselves. That is, in their own interest... So, it results in a holistic way of looking at nature, that is, a way of looking at nature and humanity's relationship to nature that combines a basic attitude and enjoyment of nature with behaviour in society for nature." (Nancho Ijin Butai 1999)

One of the leading US environmental ethicists since the 1970s has been the philosopher *J. Baird Callicott*. Inspired by Leopold's land ethic, he has developed and systematised the ecocentrist approach. Callicott interprets both the pathocentrist and the biocentrist approaches as forms of "extensionalism": they expand the number of individuals with moral status but remain within the individualist concept by accepting the assumption that only individuals can have moral status. However, according to Callicott, the major environmental problems of the present cannot be solved in this way because what is at stake is the threat to transorganismic entities ("transorganismic levels of biological organisation", J. Baird Callicott 2017, 113). From the small to the large, he lists populations, species, communities, landscapes and biomes (especially water, desert, forest, meadow and tundra). Now, for 2500 years, Western philosophy has advocated an individualistically conceived morality based on teleological essence ontology (J. Baird Callicott 2017, 114). However, this does not work for ecosystems and other collectives, because ecosystems or species are not "teleological centres" (J. Baird Callicott 2017, 116).

Consequently, a more radical way of thinking is needed that abandons essence ontology as the basis of ethics (J. Baird Callicott 2017, 117). Calli-

cott finds this in relational ontology: all members of a community are, in principle, exposed to situations of competition which force them to cooperate. And it is precisely this cooperation that ethics seeks to regulate normatively. Acting subjects are thus knots of social and ecological strands of relationships—without these relationships they are nothing. Their relationships define their rights and duties, and since living beings are members of different communities and have different relationships in each, different rights and duties arise depending on the community (J. Baird Callicott 2017, 122 citing Margaret Midgley 1984).

What is remarkable from the perspective of theological ethics is that Callicott adds a third criterion to the two usual criteria for plausible ethics, namely internal logical consistency and adequacy with external reality: an aesthetically and spiritually satisfying mediation. And he sees this in religions rather than in purely philosophical world views. He recognises that the Christian religion in particular has allowed itself to be challenged by Leopold's and White's criticism to find a more appropriate interpretation of the biblical texts. This, however, is also valuable and appealing to non-believers: "Responding implicitly to Leopold's critique and then explicitly to White's, adherents of the Judeo-Christian worldview, for example, have very effectively reconciled it [...] with the aims of conservation biology [...] and environmental ethics. In declaring the plants and animals that He created to be 'good', God might plausibly be understood to have declared them to be intrinsically valuable. God gave to Adam the job of dressing the Garden of Eden and keeping it. Thus the human dominion over nature might well be understood to be not that of a despot, but that of a steward or caretaker." (J. Baird Callicott 2011, 4)

The German ecologist and philosopher *Martin Gorke* bases his plea for holism primarily on the problem of the protection of wilderness areas, which is difficult to justify. While the protection of species is hardly justifiable for anthropocentrism—not all species are useful for humans—pathocentrism and biocentrism also reach their limits when it comes to justifying the protection of wilderness. Although wilderness areas generally serve species protection, not every additional wilderness area serves even better species protection. Nor does the species protection concept justify why a specific area should remain wilderness or become wilderness again. The decisive argument must therefore be "respect for self-organising nature" for its own sake (Martin Gorke 2010, 81). The extended categorical imperative is: "Act in such a way that you never treat everything that exists merely as a means, but always at the same time as an end in itself". (Martin Gorke 2010, 111–112). Gorke's subsequent attempt to apply the four basic

principles of medical ethics by Tom Beauchamp and James Childress, in a slightly modified form, to environmental ethics, however, remains rather complicated and does not convince me.

The Australian ecologist Haydn Washington, the US social ethicist Bron Taylor, the Dutch social anthropologist Helen Kopnina, the South African ecologist Paul Cryer and the Swedish environmental scientist John J. Piccolo summarise their joint plea for ecocentrism thus (Haydn Washington et al. 2017, 39):

- 1) Ethically, there is no reason to deny respect to nature: "There is no philosophically or scientifically sound justification why moral concern should not be extended to all of the ecosphere, both its biotic and abiotic components".
- 2) From an evolutionary biological point of view, there is no justifiable dividing line between entities with and without inherent worth.
- 3) Spiritually speaking, ecocentric values are increasingly flowing into nature-based forms of spirituality.
- 4) Ecologically, living beings and habitats are interdependent: "the ecosphere and all life is interdependent and [...] both humans and non-humans are absolutely dependent on the ecosystem processes that nature provides."

It is easy to see that the international quintet around Haydn Washington is primarily concerned with demanding an appropriate attitude towards all of nature, namely respect. This also results from their recognisable proximity to the contemporary spirituality of nature or Creation. However, the concept of inherent worth or dignity is usually additionally associated with the derivation of ethical norms or principles. Whether and, if so, how they imagine this, however, is left completely open by the five.

Disappointment with the anthropocentric approach of international environmental policy can be felt in almost all ecocentric approaches. Their complete ineffectiveness is strongly associated with anthropocentric thinking: "It is difficult, therefore, to conceive of how continuing to prioritise self-interested anthropocentric rhetorical strategies will lead to effective collective action. We contend that such values do not provide the kind of affectively rich and resonant moral languages that are needed to inspire effective political action ... At best, such premises provide a disputable prudential and utilitarian argument for conservation. It is hard to imagine that such premises would inspire visionary proposals to maintain biodiversity, such as the one to protect at least a half of Earth's remaining ecosystems..." (Bron Taylor et al. 2020, 1093). When we consider in the following sections which of the four justificatory approaches to environ-

mental ethics is most appropriate, we need to take this emotional side into account.

Finally, we must again ask about internal logical consistency and adequacy with regard to external reality. Three questions in particular arise with regard to the *consistency* of ecocentric approaches: Firstly, it is perfectly coherent to establish relationality as a constitutive element of the definition of being. However, there remains an epistemic difference between the relations of the individual and the individual itself—the individual is the logically superior, ontologically more comprehensive entity. The special status of individuals within anthropocentrism, pathocentrism and biocentrism, which is criticised by ecocentrism, ultimately remains. Secondly, the demand of respect for all that exists is extraordinarily plausible. But the theorem of inherent worth classically contains not only a demanded attitude, but also a normative principle. And how this can be conceived ecocentrically is not made visible by any of the authors. Thirdly, the ecocentric approaches tend to place systems above individuals. In terms of thinking, they thus erect hardly any barrier to eco-totalitarianism: the system is everything, the individual nothing.

In terms of *adequacy*, ecocentric approaches urge a more precise focus on the rationale of protecting collective systems or entities such as populations, species and ecosystems. Here, the first three justification approaches of environmental ethics, which focus on individuals, are often insufficient, for they must always argue with a benefit for morally relevant individuals—and this benefit is sometimes non-existent or at least not recognisable. Therefore, it will have to be asked whether and how this shortcoming can be compensated for.

5.5 *Inherent worth/dignity as ascription of an individual moral status*

Four approaches to the justification of environmental ethics are on the table, and it is time to choose one of them. To this end, two points of view in particular will be considered: In the next sub-chapter, we will explore the question of how the needs of individuals and systemic requirements can be mediated with each other. Before that, however, it must be clarified which entities are to be ascribed to "inherent worth" or "dignity". For without exception, all concepts of environmental ethics of the last few decades recognise the concept of inherent worth or dignity or its negation as having a guiding function. Even those who reject it must respond to it because it has this guiding function for competing designs.

Therefore, a word must first be said about the *terminology*. In English, one usually speaks of "inherent worth", sometimes also with the same meaning as "intrinsic value", which is inaccurate¹⁵. In Spanish, one speaks of "valor propio", in Italian of "valore proprio" and in French of "valeur propre". The concept of "creaturely dignity", on the other hand, has only become widespread in ethical debate in German-speaking countries. Because it appears in the Swiss Federal Constitution, it is also used there in an Italian translation, "dignità della creatura", and in a French translation, "dignité de la créature". In Italy and France themselves, however, it has not yet been received. The same applies to the English-speaking world: English publications on the Swiss constitution use the term "dignity of creatures", but the term does not appear there beyond the confines of Swiss legislation. De facto, therefore, we are dealing with a German-language and Swiss proprium. In terms of content, however, only some of the concepts of inherent worth and some of the concepts of creaturely dignity are congruent. Therefore, these concepts should first be clarified.

5.5.1 The normative content of the attribution of inherent worth/dignity

As the term "inherent worth" indicates, it refers to a value that is assigned to the being in question in advance of any valuation by others, i.e. that lies beyond the calculations of external utility. Something that has inherent worth has independence and self-purpose (Paul W. Taylor 1981, 201; Hans J. Münk 1997, 26). It is not absorbed in the relationship to other beings. This results in several normative contents (for the following, cf. above all Michael Rosenberger 2001, 146–153):

- 1) The ascription of inherent worth or dignity expresses that something has "moral standing a priori" and deserves "moral consideration" (Paul W. Taylor 1981, 199–201). First of all, a priori to concrete conflicts of interest, an inherently valuable being has a *moral status*. It is not

15 Inherent value and intrinsic value are often used as interchangeable terms. John O'Neill 1992, 119–137 identifies several conceptualisations for intrinsic value, which in my opinion are on different levels and are compatible with each other. Tom Regan 1984, 264–273 and Paul W. Taylor 1984, 150–151 and 1986, 78–79 distinguish between inherent value as the dignified, non-scalar value of an individual and intrinsic value as the intentional, measurable value of a good. Paul W. Taylor 1981, 199–201, on the other hand, does not yet distinguish between the two concepts—one can see here a development of his thinking towards more conceptual precision.

arbitrarily available for disposition, but is first and foremost (*prima facie*) unavailable: "its good is *prima facie* worthy of being preserved or promoted as an end of itself" (Paul W. Taylor 1981, 201). Whoever has inherent worth is to be "morally considered" (Martin M. Lintner 2017, 120–121) and their "well-being [is to be] considered for the sake of the living being itself" (Martin M. Lintner 2017, 126).

- 2) A being with inherent worth or dignity is a subject towards which we have *direct duties*, i.e. a "*moral patient*" (Friedo Ricken 1987, 4; Hans J. Münk 1999, 289). The duties apply not only to people "in regard to" the being in question, but to the being itself.
- 3) Because the being that is accorded inherent worth or dignity has an end in itself, it must never be completely instrumentalised. This corresponds entirely to the formula for humanity of Immanuel Kant's categorical imperative: "Act in such a way that you treat" any being with inherent worth "at all times also as an end, never merely as a means." (modified from Immanuel Kant, *Grundlegung zur Metaphysik der Sitten* AA IV 429) In research literature, the term "prohibition of instrumentalisation" is often used. But strictly speaking, it is *prohibition of total instrumentalisation*. Kant's point is not to demand that people should not at all use each other or view each other in terms of utility. That would be completely impossible because we use each other all the time. The prohibition of total instrumentalisation, on the other hand, inculcates the duty to respect the used subject "at the same time as an end" for itself. This restricts use without making it impossible. "'Inherent worth' then denotes the normative premise that nature is not absorbed in being a means for human ends, but can only be used for the benefit of human beings if it is at the same time respected for its own sake." (Bernhard Irrgang/ Ralf Bammerlin 1998, 403; similarly Friedo Ricken 1987, 17 and Hans Gleixner 1989, 63).
- 4) In general, there is a *duty of justification* towards beings with inherent worth or dignity. Every use of such a being needs good and weighty reasons, which must be named and examined.
- 5) In fact, this means a *reversal of the burden of proof*: it is not a third party who must prove that an action against an entity with inherent worth or dignity is morally reprehensible, but rather the actor must prove that it is morally justified (J. Baird Callicott 2006, 115).
- 6) Beings with inherent worth or dignity are bearers of their own goods (Philipp Balzer et al. (eds.) 1998, 45–50). In cases of ethical conflict, these goods must be *weighed fairly against* the goods of other beings with inherent worth or dignity (Michael Hauskeller 2015, 146). "Fair"

means that the weighing of goods is "blind" to the owners of the respective goods. It does not matter whether they belong to a human being, an animal, a plant or a mountain, as long as they have been assigned inherent value in advance. What counts is only the weight of the respective goods in question. Equally important goods of human and non-human beings count equally: "their good is to be given as much weight in moral deliberation as our own good" (Paul W. Taylor 1984, 157). What remains open, of course, is how the weight of the goods is measured.

All six normative contents of the inherent worth/dignity theorem can also be argued without this itself. This already indicates that the attribution of dignity or inherent worth has more of an emotional than a rational effect. It signals an inhibition and an invitation to compassion. However, the direct obligations towards the being (2) and the fair weighing of its goods (6) cannot be justified if one denies the being in question any form of delimited "individuality"—without which, at best, an indirect duty would be justifiable. This observation will be of importance when it comes to the question of who is to be accorded inherent worth or dignity and who is not.

5.5.2 The necessary incommensurability of inherent worth/dignity

"In the realm of ends, everything has either a price or a dignity. What has a price can also be replaced by something else as an equivalent; what, on the other hand, is above all price, and therefore does not grant an equivalent, has a dignity... but that which constitutes the condition under which alone something can be an end in itself has not merely a relative value, i.e. a price, but an inherent worth, i.e. dignity." (Immanuel Kant, *Grundlegung zur Metaphysik der Sitten* AA IV 434–435)

With these famous sentences, Immanuel Kant tries to clarify how dignity is to be understood. In the first sentence, it almost seems as if something can either only have a price or only have dignity. In reality, however, what has dignity always has a price, while what has a price does not always have dignity. This becomes clearer when one adds a second passage from Kant's work: Man, *considered as a part of nature*, has a "common value" and a utility value—and "*considered as a person*" a dignity that is "above all price" (Immanuel Kant, *Metaphysics of Morals* AA VI 434).

If we disregard the fact that Kant only grants dignity to human beings—a question that we still have to clarify—, very clear characteristics of

what distinguishes dignity from price emerge at first (cf. on the following Michael Rosenberger 2001, 153–157):

- 1) Price signals replaceability and interchangeability, whereas dignity signals *uniqueness and non-replaceability*. In terms of utility, every human being is replaceable. As a person, however, they are irreplaceable. Now, replaceability and irreplaceability "are not ontological determinations in the first place, but different perspectives on things... Accordingly, to say that a thing has dignity is basically to call upon it to be looked at in a certain way (and treated accordingly)" (Michael Hauskeller 2015, 145).
- 2) The price signals the comparability of values that are scalar, i.e. occupy a continuous scale from a minimum to a maximum. It knows a greater or a lesser value and also an equal match in value (with Kant: "equivalence"). Dignity, on the other hand, signals *incomparability* (incommensurability) and is not scalar but *binary*: either a being has dignity, or it has no dignity. Either it deserves moral consideration or it does not: "A being or an entity either deserves or does not deserve moral consideration. Moral consideration tends not to be a scalar term mapping degrees or levels." (William C. French 1995, 53–54). Either its goods are to be equally brought into an assessment or not. Dignity knows no more or less, no equal match but only either-or (Tom Regan 2004⁴, 235–237). This and only this is what is meant by the term of "equality" of the bearers of dignity, as advocated by Arne Næss or Paul W. Taylor. It is about formal equality, because the concept of dignity is "a concept of equality" (Hasso Hoffmann 1988, 337).
- 3) The price denotes an instrumental value of the priced good for a specific purpose. It is, as Kant says, relative. Dignity denotes an end in itself. It belongs *directly* to its bearer, is *not transferable* and cannot be exercised by proxy like rights. Unlike a prize, it *cannot be lost* (Tom Regan 2004⁴, 235–237).
- 4) The price is competitive. Once spent, the money is no longer available to buy another good. Dignity, on the other hand, does not compete with the dignity of others. A person can show respect to all those who deserve it qua dignity. Yes, if someone disrespects the dignity of one party in a given situation, then he also disrespects the dignity of all other parties. Let us assume that an employer has advertised a job for which one of his friends is applying. And let us further assume that the employer gives the job to his friend solely because he is his friend, although he is not the best qualified candidate. Then this would not only be a violation of the dignity of the better qualified applicant,

but also a violation of the friend's dignity. The employer would have humiliated him and made him dependent on him.

The central point of this comparison is the second: dignity is not commensurable. All bearers of dignity therefore enjoy the *egalitarianism*, the formal *equality*, that has been associated with it since the French Revolution. So if we extend dignity to some non-human entities, they enjoy equality. And this is precisely what biocentrists intend when they speak of the "equality" of living beings. Thus, Bill Devall and George Sessions (1985, 67) define: "all things in the biosphere have an equal right to live and blossom and to reach their individual forms of unfolding and self-realisation." And Paul W. Taylor justifies this fundamental equality of all living beings with their equal membership in the earth's community: "the place of humans in the domain of life on Earth is one of fundamental equality with other members of the animal kingdom, an equality that extends to all forms of life in our planet's natural ecosystem" (Paul W. Taylor 1983, 240). However, this equality (as in the interpersonal sphere!) is of a purely formal nature. The duties of humans are *prima facie* equally binding on all living beings: "we owe duties to them that are *prima facie* as stringent as those we owe to our fellow humans" (Paul W. Taylor 1984, 157). Tom Regan, who understands the inherent worth of all subjects of a life in terms of us all having the same right to be treated with respect (Tom Regan, in: Peter Singer (ed.) 1986, 43–44), sees this similarly in pathocentrism. Formally, the goods of humans and non-human living beings should be given equal consideration in the weighing of goods: "their good is to be given as much weight in moral deliberation as our own good" (Paul W. Taylor 1984, 157).

On the other hand, all those who assume a *gradation of inherent worth* commit a category error. These are numerous moderate anthropocentrists such as Martin M. Lintner (2017, 124–129 and 175) or Heike Baranzke (2015, 40–44 et al.), but also almost all process ethicists such as John B. Cobb and Donald R. Griffin (1979, 77–78), Charles Birch (1993, 99–101) and Michael Schramm (1991, 168–170) as well as certain utilitarians such as Robin Attfield (1995, 178–179). To put it bluntly, there is no need to introduce graded dignity or graded inherent worth. They add nothing that could not be justified without them. Heike Baranzke (2015, 57) explicitly admits this: "the proclamation of an animal dignity would not lead anywhere either". No, the goods of humans and non-human living beings must be graded. Goods are scalar, weighted, compared and weighed against each other. This also applies to the goods of different people. If you only have one respirator, but several people who are seriously ill with Covid-19, then you have to compare their chances of recovery with each

other. But the dignity of these people is not weighed against each other. They are respected when decisions are made fairly, i.e. without regard to the person; their dignity is disregarded when decisions are made unfairly.

5.5.3 The bearers of inherent worth/dignity. Methodological preliminary remarks

To which entities should "inherent worth" or "dignity" be ascribed? This is the question to be discussed here. Before it can be answered, some methodological preliminary remarks are helpful.

All four approaches "conclude" *from being to the ought*. They draw on observable facts to arrive at ethical statements. All four (!) understand "concluding" in the sense of plausibilising adequacy with regard to the reality that can be found and not in the sense of a compelling syllogistic deduction of the ought from being. Moral demands should be as appropriate as possible to the reality that can be found. In order to underpin this appropriateness, all four approaches strive for a hermeneutics of being with regard to the question of the ought. This corresponds to the classical natural law way of thinking that anthropocentrism also follows (which Heike Baranzke 2015, 50–52 passes over). "By nature, parts of nature have no inherent worth. Anyone who claims this is subject to the verdict of the naturalistic fallacy." (Bernhard Irrgang 1990, 336 and literally the same 1992, 85; similarly again 1992, 72) Well, Irrgang may be reassured, for no one asserts what he rightly marks as a fallacy. "The conclusion from fact to value is never logically compelling." (Michael Hauskeller 2015, 145) But this is just as true for anthropocentrism. Here, all four approaches must be measured against the same yardstick. The question is therefore not what can be logically derived from being for the ought, but which demands for the ought are most appropriate to being (adequacy) and can thus best be made plausible.

However, some approaches are more presuppositional than others. The *parsimony criterion*, i.e. the option of choosing the argumentatively more parsimonious of two otherwise equivalent approaches, is an important criterion in this context. Here, anthropocentrism in particular has two disadvantages: First, at the level of its analysis of being, it asserts that only humans possess reason. However, in view of the findings of modern biology, it is becoming increasingly difficult to substantiate this. Secondly, it formulates obligations "with regard to" animals (and plants) "vis-à-vis" humans on the level of ought requirements. Compared to this, the bio-

centrist demand of direct duties towards animals and plants is argumentatively far more parsimonious (Friedo Ricken 1987, 4). At the other end of the scale, ecocentrism must also allow itself to be asked whether it is argumentatively economical enough. Due to its paradigm shift from moral individualism to moral collectivism, it imposes heavy additional argumentative burdens on itself. Now, the criterion of parsimony can only be applied secondarily, namely when several comparably adequate and consistent approaches compete with each other. In itself, it does not justify a preference for one or against another approach. However, it should be kept in mind.

A third methodological preliminary remark concerns the relationship between *moral agents and moral patients*: In none of the four approaches are moral agents and moral patients completely congruent, not even in anthropocentrism. One thinks of the famous "marginal cases", i.e. people who do not possess sufficient reasonableness, such as people with dementia or those who are comatose, children or the intellectually disabled. They are obviously no longer moral agents (those with dementia or who are comatose, although their earlier expressions of will may have to be taken into account) or at most in a limited sense (children and the intellectually disabled, although their claim to self-determination has been significantly expanded in recent decades). Not all people have to be moral agents, otherwise the distinction would be invalid. Positively speaking, it enables the advocacy of moral patients who are incapable or limited in their ability to judge and express themselves—and this could also be realised in analogy with non-human living beings and collective entities. In contrast to law, such representations in morality are only imagined before the "inner court" of conscience anyway.

According to the fourth preliminary remark, it was Peter Singer who popularised the accusation of *speciesism* (Peter Singer 1994², 82–94). Speciesism means the insufficiently substantiated assertion that species membership has moral significance in a particular question. Singer accuses anthropocentrism of such speciesism but does not realise that his own ethics represent just such an ethic, which privileges a few additional species. If one wants to avoid speciesism, one must at least advocate "species-impartiality": "the principle of species-impartiality... that every species counts as having the same value in the sense that, regardless of what species a living thing belongs to, it is deemed to be prima facie deserving of equal concern and consideration on the part of moral agents. Its good is judged to be worthy of being preserved and protected as an end in itself and for the sake of the entity whose good it is." (Paul W.

Taylor 1986¹ / 2011², 155). From this perspective, biocentrism has clear advantages.

Complementary to the speciesism theorem is the talk of *extensionalism*. It says that recognised ethical concepts are extended to further individuals for whom they were not originally intended. Such an extension is by no means unproblematic. But if it is convincing, it has the charm of not requiring a radical break with the system. Pathocentrism and biocentrism are two stages in the expansion of moral individualism, which is classically embodied by anthropocentrism. Ecocentrism, on the other hand, explicitly does not see itself as an extension of preceding ethical systems, but as a paradigm and system change from moral individualism to moral collectivism. It will thus be necessary to examine, on the one hand, whether and to what extent moral individualism should be extended and, on the other hand, whether a radical system change to moral collectivism is necessary.

5.5.4 The bearers of inherent worth/dignity. The fundamental decision

To which entities should "inherent worth" or "dignity" be ascribed? This is the guiding question of this sub-chapter. It must be answered using philosophical arguments and can then be compared with theological considerations. So let us look again at the four approaches to justification:

Anthropocentrism regards only those who can in principle claim respect for their dignity as bearers of dignity. The maxim is: those who can, in principle, reasonably determine themselves must not be hindered in their self-determination by others. For morality must necessarily recognise the morality of others in order to not contradict itself. That is why we demand respect for the dignity of the lawless, the weak and the barely self-determined among those who are, in principle, capable of self-determination. The reason for ascribing dignity is thus not factual but potential moral self-determination. Now, on the one hand, it is clear that the set of moral agents must be the necessary minimum of moral patients in order for self-contradiction not to occur. However, the question arises of whether this is enough. Should the moral agents want it to be enough to consider only themselves as moral patients? Quite apart from the fact that the biological plausibility of ascribing reason to humans alone is continually declining, the plausibility of making moral capacity the sine qua non for recognition as a moral patient is declining at least as strongly.

Pathocentrism tears open two nasty trenches instead of one: The sentient beings that supposedly deserve its central attention are only the second

class of living beings. Above them are the extraordinarily privileged living beings to whom high intelligence is ascribed; below them are the plants, which receive no moral consideration at all. This makes pathocentrism the least consistent solution with which to justify an environmental ethic—it stands between all stools.

As long as one remains in moral individualism, everything points to *biocentrism*. It can be supported by at least three considerations. Its main thesis is that every living being has *its own good*, a "good of its own", which is realised in "the full development of its biological powers" (Paul W. Taylor 1981, 199). In addition, it is also a (co-)bearer of other goods, e.g. the good of its own population and the good of its own species, which consists in the transmission of genetic information and in the preservation of the species. The inherent worth of a living being, however, is grounded in the potency of realising its own biological powers (Paul W. Taylor 1984, 154–155). If it is then further presupposed that "membership in the earth's community" (onto-)logically precedes the concrete Thus-Being of the living being, then the direct moral duty to respect and promote the fundamental potency of the self-realisation of every living being arises a priori for man. "Now, there is indeed a property that human beings share with animals and which is at least as plausible a basis for the ascription of absolute value as Kantian autonomy and related conceptions. This property consists in the fact that every human being and every animal is a good for itself... no human being and no animal experiences itself as a means to another end." (Michael Hauskeller 2015, 143). And "then the Kantian assumption that animals existed only as means... appears as an unjustified and almost arbitrary positing." (Michael Hauskeller 2015, 144)

Every living being has two *characteristics analogous to self-interest* in the Kantian sense: "It is the subject of purposes and it has a practical self-relation." (Friedo Ricken 1987, 8; also Eberhard Schockenhoff 1993, 403). Even living beings that have no sensations of pleasure and pain possess "needs" that are analogous to conscious "interests". Plants tend to fulfil their needs, for example for light and water, very purposefully. This corresponds to the reasoning of Aristotle, who also attributes striving to the vegetative soul faculty (Friedo Ricken 1987, 14–16; Aristotle, *De anima* II 4, 415a25-b2). Plants also relate to themselves. Their organism is not only the result, but at the same time the cause of material accumulations of itself and the bearer of identity in all material exchange. In metabolism, therefore, something like "freedom" (Hans Jonas 1973, 123) becomes apparent in a very analogous way. Consequently, it is not acceptable to compare the abilities of healthy animals or plants with the abilities of "defective"

humans and then draw a supposed analogy (Robin Attfield 1995, 176). This does not do justice to plants, animals or humans. An analogy must start at the formal level: With the *capacity of all living beings to live and develop according to their possibilities*: "living creatures each in different ways have the capacity to lead the form of life proper to their own kind" (Robin Attfield 1995, 176). Of course, such a conclusion by analogy does not allow a compelling deduction from being to ought. However, its formal, logical consistency can be demonstrated.

A second, almost parallel line of argument for biocentrism comes from process ethics. Frederick Ferré's "calogenic view" follows the Platonic concept of the beautiful and is strongly influenced by aesthetics. He assumes that the reason for attributing inherent worth to an entity is its *subjective immediacy* (Frederick Ferré 1995, 425). What is meant is the temporal immediacy of *experiencing and enjoying in the now* (rejoicing in the now; Frederick Ferré 1995, 419). A being that can "enjoy" something in the now must make evaluations and decisions about what it considers "beautiful" for itself. Accordingly, it is not the capacity for morality that is the criterion for the recognition of inherent worth, but the capacity for enjoyment (John B. Cobb/ Donald R. Griffin 1979, 53–56). Conversely: "For things that do not seem to have any capacity for enjoyment, no intrinsic value is conceivable." (John B. Cobb/ Donald R. Griffin 1979, 75). Process ethics allows for analogies: For it, the concept of the beautiful includes everything that is usable, i.e. valuable, for a being. And the process of valuation does not have to take place consciously or self-consciously: a primitive unicellular organism absorbs certain things into itself, others not. It therefore "values" in the broadest sense and is a "centre of appreciation and preference" (Frederick Ferré 1995, 424) and therefore has inherent value. The English play on words that everything is "valuable", that possesses "value-ability", "evaluation ability", often appears in this context.

A final argument is more supportive: the *uniqueness of each organism*. Modern science regards each organism as a "unique, irreplaceable individual" (Paul W. Taylor 1981, 210) and discovers its uniqueness, not only but also in its genetic identity. The recognition of this uniqueness increases the chance of developing a sensitivity to what a living being is and how wonderfully it shines in its uniqueness. It should be noted that uniqueness and irreplaceability "are not primarily ontological determinations [but] different perspectives on things [...] Accordingly, to say that a thing has dignity is basically to invite it to be looked at (and treated) in a certain way" (Michael Hauskeller 2015, 145).

Let us move on to the fourth and last approach: *Ecocentrism*, as has already been shown, very consciously makes a systemic shift from moral individualism to moral collectivism. Since it is in this way more radical than the other three approaches, it will have to present all the more weighty reasons in order to be considered plausible. For the founding father of ecocentrism, an ethical relationship to the "land" (i.e. the biosphere) is inconceivable without its inherent value: "For me, it is inconceivable that an ethical relationship to the land can exist without love, consideration, admiration and respect for its value. By value, of course, I mean much more than material value; I understand it to mean value in the philosophical sense." (Aldo Leopold 1992, 173) Here, inherent value is simply postulated, not substantiated, which may be forgiven by a forest scientist, but not by ecocentrism as such.

A few ecocentrists claim there is also an inherent value in inanimate matter and not only for living beings and collective entities consisting of living beings. They justify the unavailability of everything that exists a priori from its *otherness and givenness* (Robert Elliot 1994, 31–44; Stephen R.L. Clark 1994, 113–128): The experience of the otherness of nature creates a distance in which a fundamental unavailability is founded. In order that this distance is not experienced as threatening and leads to a fundamental fear of nature, man is given the second experience of aesthetic values without recognisable intention or purpose (aesthetic value without intention). With this, man can be in awe of the otherness of nature. What remains open in these reflections, however, is how normative ethics can be developed from this double experience of nature beyond the concept of inherent value. In this respect, it has hardly found an echo in the advancing debates.

Most ecocentrists do not claim there is inherent value in inanimate matter, but only in living beings and collective entities made up of living beings, such as populations, species, ecosystems or biomes. Thus, deep ecology abandons the ontological human–environment dualism and replaces it with the paradigm of *organisms as nodes in the biospheric web of intrinsic relations* (Arne Næss 1973, 95). Relations are intrinsic when they are understood as an indispensable part of the definition of organisms. In this respect, there is a need for "population planning" for all living beings, oriented towards the capacities of the ecosystem (Arne Næss 1973, 96), both for humanity (primarily through birth planning) and for non-human living beings (primarily through the killing of individuals). This is the holistic approach: the survival of the system as a whole takes precedence

over the lives of individuals, including individual humans, because it is their livelihood.

This is precisely the main argument of ecocentrism for its systemic view: The major environmental problems of the present cannot be solved with approaches of moral individualism because they involve *threats to transorganismic entities* (J. Baird Callicott 2017, 113): populations, species, communities, landscapes and biomes (especially water, desert, forest, meadow, and tundra). Now, for 2500 years, Western philosophy has advocated an individualistically conceived morality based on teleological essence ontology (J. Baird Callicott 2017, 114). But this does not work for ecosystems and other organismic collectives because they are not "teleological centres" (J. Baird Callicott 2017, 116). Traditional essence ontology must therefore be replaced by relational ontology as the basis of ethics (J. Baird Callicott 2017, 117). In it, acting subjects are to be seen as knots of social and ecological strands of relationships—without these relationships they are nothing. Their relationships define their rights and duties, and since living beings are members of different communities and have different relationships in each of them, different rights and duties arise depending on the community (J. Baird Callicott 2017, 122).

As understandable as the concern of ecocentrism is, many questions remain unanswered to this day: First of all, it is not really clear in the ecocentrist approaches how the totalitarianism of the ecosystem over individuals can be intrinsically avoided. Nor does it become clear how the inherent worth of organisms can be justified if individuals are not decisive. And finally, the approach of justification with living beings as nodes of social and ecological strands of relationships gives the impression that the individuals, even if not as isolated individuals, are the starting point of the considerations.

The question thus remains open whether systems are valuable in themselves ("inherent value") or only in their significance for their members ("utility value"). Traditional individualist ethics would opt for the second alternative. This does not prevent it from viewing constituted systems as "quasi-persons". A look at law, which is related to ethics, makes this clear. There, a distinction is made between natural and legal persons. Natural persons are real individuals, legal persons are "quasi-individualised" institutions, i.e. constituted systems. Such systems are presented in law as analogous to persons, as if they were individuals. They have clearly defined rights and duties; they enjoy a legal status. But only natural persons are ascribed dignity by law—only they deserve to be preserved and respected for their own sake. The existence of legal persons, on the other hand, is

extinguished by a simple legal act when they can no longer fulfil their purpose. Legal status thus accrues to natural persons a priori, but to legal persons a posteriori when they are established as such by a legal act.

It is precisely from these considerations that my plea for "*holistically based biocentrism*" arises: this is, in its basic form, a form of moral individualism and attributes inherent worth or dignity to all living beings and only to them. In a comparison of the first three approaches to the justification of environmental ethics, biocentrism has clearly proven to be the most adequate, consistent and also the most parsimonious option. However, in order not to end up in system-blind individualism that ignores all the relationships of living beings, I speak of holistically based biocentrism. Collective systems have no inherent worth a priori. However, they are of paramount importance for the common good of living beings because they are the condition of possibility for the individual good of their members. This can sometimes even mean that the system takes precedence over the individual, as in law. Also, again analogous to law, it may well make sense to ascribe a moral status to certain communities of life a posteriori and treat them as "quasi-persons". In concretising the model proposed here, we must therefore keep a careful eye on whether it can sufficiently protect collective life communities. Overall, then, holistically grounded biocentrism is moral individualism bound to the common good.

5.5.5 The theological deepening of the attribution of inherent worth/dignity

Is the philosophical reasoning presented here also compatible with Christian developments? And conversely, can theology provide an additional benefit? As a reminder: theological ethics does not lead an independent existence alongside philosophical ethics or even in competition with it. Rather, it participates in the debate of philosophical ethics and tries to deepen it (cf. chapter 3/Introduction). According to the core thesis of "Autonomous Morality" by Alfons Auer (1971 and 1984², 212–215), there is no material ethical proprium, no "special morality" for the Christian (or any other) religion: "The human is human for pagans as well as for Christians." (Alfons Auer 1984², 212). Nevertheless, faith opens up a horizon of meaning that integrates, stimulates and critiques ethical judgement formation and justification. So let us look again at the two main sources of the Christian ethos presented in the previous chapters, the Bible and

the liturgy, as well as supplementing them with some recent magisterial statements and systematic-theological reflections.

Biblically, a relatively clear option in favour of biocentrism can be identified. Although plants were not yet considered living beings at the time most biblical texts were written, the fundamental distinction is that between living beings and habitats. Although the anthropocentric misinterpretation of the image of God and the governmental mandate in Gen. 1:26–28 has dominated the field for the longest time in Church history, it has been set right by exegesis in recent decades. The image of God and the mandate to govern afforded to man are aimed at methodological and formal anthropocentrism, but not at material anthropocentrism. In general, one must read these sentences embedded in the context of the entire Seven Days Work. Johannes Reiter and Hans Münk recognise in them the direct reference by God to all creatures as a metaphor for their inherent worth (Johannes Reiter 1989, 195–196; Hans J. Münk 1997, 26 and 1999b, 283). On the basis of this reference, it is said in Gen. 1 that everything was good. Everything was created good by God, found to be good and included in redemption (Hans J. Münk 1997, 23).

In Gen. 2–3, we recognised a significant difference to other ancient oriental Creation myths: While in these myths humans and animals are created for the benefit and joy of the deity, in Gen. 2–3 they are there for their own sake and for the joy of life (Othmar Keel/ Silvia Schroer 2002, 142). Consequently, the narrative does not think theocentrically or anthropocentrically, but biocentrically. Finally, the flood narrative in Gen. 6–9 also underpins biocentrism: all living beings are equally threatened by the flood, all are to be saved. All living beings are God's covenant companions, so justice is due to all for their own sake. Consequently, the commandments of the Torah contain a series of regulations that protect animals for their own sake and give them certain rights.

The biblical vision of the peace of Creation can indeed be understood in a theoretically anthropocentric way, as Paul demonstrates under Stoic influence in Rom. 8. Its dynamic, however, is towards a biocentrist view of the world, and in most biblical testimonies this is precisely the case. We would think God too small if we imagined that he created the non-human Creation only as a temporary backdrop or resource. Moreover, other biblical texts from the Hellenistic era explicitly doubt Greek anthropocentrism, as Ecc. 3:18–21 powerfully demonstrates.

With Paul, however, there are indications that Stoic anthropocentrism will begin its triumphant march in Christian theology a little later. In the *liturgy* of the Church, this paradigm shift is still reflected today, but, as

we have seen, in recent decades it has gradually been relativised. Like the texts of the masses at Christmas, many liturgical forms oscillate between anthropocentric, biocentric and ecocentric formulations. Only the ductus of the IV High Prayer in the post-conciliar missal is consistently composed in a biocentric manner. Finally, *popular piety* has remained closer to biblical biocentrism than the official liturgy.

As far as *doctrinal statements* are concerned, we must first look at the Pastoral Constitution "Gaudium et Spes" of *Vatican Council II*, which in 1965 was still characterised by unbroken anthropocentrism. Thus, it can simply state: "According to the almost unanimous opinion of believers and unbelievers alike, all things on earth should be related to man as their center and crown [centrum suum et culmen]" (GS 12; note that the official English translation fails to translate well "culmen", which does not mean "crown" but "summit"). The biblical mandate of government also does not experience any limitation; on the contrary, it is to be extended even further: "Meanwhile the conviction grows ... that humanity can and should increasingly consolidate its control over Creation [imperium suum super res creatas]..." (GS 9). This reflects an attitude to life that—seven years before the Club of Rome report and still two years before Lynn White's critique—is still based on an unbroken optimism that man can get to grips with everything for the lasting good of humanity. Creation is even referred to in Latin as "res creatas", i.e. "created things". The fact that it is about living beings is deliberately concealed. And even the concept of culture is defined in terms of dominance over Creation: "The word "culture" in its general sense indicates everything whereby man ... strives by his knowledge and his labor, to bring the world itself under his control. [cognitione et labore in suam potestatem redigere studet]..." (GS 53). "When man develops the earth by the work of his hands or with the aid of technology, in order that it might bear fruit and become a dwelling worthy of the whole human family..., he carries out the design of God manifested at the beginning of time, that he should subdue the earth [terrae subiiciendae]..." (GS 57). The only perspective of hope for Creation is that of Paul who, despite adopting Stoic anthropocentrism, cannot avoid granting Creation access to eternity: "...all that creation which God made on man's account will be unchained from the bondage of vanity [a servitute vanitatis liberabitur tota creatura illa, quam Deus propter hominem creavit]" (GS 39 alluding to Rom. 8:21). All in one, the Pastoral Constitution is thus a mirror of its time. Of all things, the document that listens most to the voice of the "world", of secular society, adopts here one of

its worst aberrations. In terms of responsibility for Creation, the Council came a few years too early.

The clearest signal of the Church's turnaround was the "*conciliar process for justice, peace and the integrity of creation*" initiated in 1983 at the Assembly of the World Council of Churches in Vancouver. In particular, the Ecumenical Assemblies of Stuttgart (EAS) in 1988 for the Churches in the Federal Republic of Germany and Dresden (EAD) in 1989 for the Churches in the GDR did pioneering work on environmental ethics (cf. on this section Michael Rosenberger 2001, 164–166). Both assemblies formulate a *clear rejection of anthropocentrism*. In the Stuttgart text, for example, it says at the very beginning of the part on Creation ethics: "Reverence for life forbids seeing the animal and plant world primarily from the point of view of their usefulness and usability for humans. This also applies to inanimate nature." (EAS 171). Accordingly, the Assembly complains: "Nature has predominantly become a raw material." (EAS 173a). Here, the Kantian prohibition of total instrumentalisation is even intensified, for "primarily" or "predominantly" reaching further than the Kantian "alone". At the end of the chapter on Creation ethics, Stuttgart repeats its rejection of "any exclusively human understanding of creation" (EAS 233a). EAD 1/(44) and likewise EAD 10/(7) oppose thinking narrowed to humans, which sees an animal only as an object and reduces it to its use value. EAD 10/(3) calls for a redefinition of man's position in nature.

The second fixed point is the explicit recognition of the *inherent worth of non-human creatures*. Stuttgart formulates this again in the framework paragraphs of the chapter on Creation ethics: In EAS 171, the inherent worth is justified by the fact that all creatures are loved by God. EAS 233a emphasises categorically and without justification: "The inherent worth of non-human creation is to be respected." This corresponds to the fact that the introductory paragraph (EAS 11) speaks of responsibility *before* creatures and not only *for* creatures. In OED 1/(44) and 8/(8), Dresden calls for respect for the inherent worth of fellow creatures. EAD 12/(12) emphasises the "inherent worth of everything created, regardless of its utility value" and "the dignity of even the 'least' creatures".

Finally, Stuttgart (EAS 181) defines "*life* and that which serves life" as the supreme principle of Creation ethics. This concept of life is clearly related to all living beings. EAD 1/(47) speaks with the same intention of an "option for life" as the basic perspective of Creation ethics. In this respect, the reflections of the German-language conciliar process, inspired by Albert Schweitzer, tend strongly towards biocentrism, even if they do not explicitly mention Schweitzer.

At first glance, this seems to be quite different in Pope Francis' encyclical "*Laudato si'*" of 2015 (cf. on the following also Andrea Vicini 2016, 176–182). In individual passages, he represents classical anthropocentrism when he states with reference to the Catechism of the Catholic Church: "the same wretchedness which leads us to mistreat an animal will not be long in showing itself in our relationships with other people. Every act of cruelty towards any creature is 'contrary to human dignity' (CCC 2418)." (LS 92). And again: "it is contrary to human dignity to cause animals to suffer or die needlessly. (CCC 2418)" (LS 130). Biocentrism is once even explicitly rejected (LS 118).

Francis, on the other hand, clearly rejects the core thesis of classical anthropocentrism: "In our time, the Church does not simply state that other creatures are completely subordinated to the good of human beings, as if they have no worth in themselves and can be treated as we wish." (LS 69). And: "The ultimate purpose of other creatures is not to be found in us." (LS 83). Furthermore, the "the value proper to each creature" is described as one of the central themes of the encyclical (LS 16; cf. also LS 76; 208). Because the encyclical, like the *Canticle of the Sun* of Francis of Assisi on which it is based, also uses "creature" to refer to living spaces (sun, water, earth, fire, etc.), one could even classify it as *ecocentric* or *holistic*, for it speaks of the value "in themselves" or "of their own" (in the Spanish original always "valor propio") of living beings (LS 69; 118), of species (LS 33; 36) and of the world (LS 115).

Laudato si''s closeness to holism is also evident in the conviction that everything is interconnected—according to LS 16, one of the central themes that run through the entire encyclical. LS 9 quotes Ecumenical Patriarch Bartholomew of Constantinople with the "humble conviction that the divine and the human meet in the slightest detail in the seamless garment of God's creation, in the last speck of dust of our planet". This metaphor of Christ's seamless garment from the St. John Passion, which we analysed earlier (cf. chapter 4.2), hardly makes sense outside an ecocentric grounding. The demand of brotherly love then also normatively results from the description of the world as an inseparable unity: "Because all creatures are connected, each must be cherished with love and respect, for all of us as living creatures are dependent on one another." (LS 42). In keeping with the Franciscan style, the Pope emphasises the universal brotherhood of all creatures (LS 92; 228) and their belonging to a universal family (LS 89–92).

In terms of content, the inherent worth is understood as *opposed to the utility value* of a resource, as was already the case with Immanuel Kant: "It

is not enough, however, to think of different species merely as potential "resources" to be exploited, while overlooking the fact that they have value in themselves." (LS 33). The intrinsic value is not scalar, but exceeds every calculation (LS 36). It can only be perceived from a different perspective than the "technocracy which sees no intrinsic value in lesser beings" (LS 118). The technocratic paradigm, which Pope Francis vehemently rejects, is blind to the intrinsic value of creatures. His thinking in categories of human ownership is opposed to the faithful view that Creation is on loan, entrusted to human beings in faithful hands: "The created things of this world are not free of ownership: 'For they are yours, O Lord, who love the living' (cf. Wis 11:26)." (LS 89) With this postulate of the divine claim to ownership, human power of disposal over Creation is massively limited.

With reference to CCC 2416, Francis twice emphasises that the intrinsic value of creatures is based on the fact that they "give glory to God by their very existence" (LS 33; 69). In the interpretation of Gen. 2, we saw that no theocentrism can be derived from this. God did not create creatures so that they might delight him, but so that they might delight in their own lives. God rejoices precisely because creatures rejoice in life. The emphasis in *Laudato si'* is therefore on existence rather than on praising God: creatures do not first have to produce a benefit or an achievement in order to acquire value—this is *given to them by their very existence*. Their existence is valuable in itself.

Nevertheless, Francis is aware of the danger of playing off *environmental protection and human protection* against each other. He tirelessly emphasises the "immeasurable" (LS 65; 158), "infinite" (LS 65), "unique" (LS 69), "special" (LS 154), even "very special" (LS 43) dignity of the human being. At a crucial point, therefore, he seems to want to reject biocentrist egalitarianism: "This is not to put all living beings on the same level nor to deprive human beings of their unique worth and the tremendous responsibility it entails. ... At times we see an obsession with denying any pre-eminence to the human person; more zeal is shown in protecting other species than in defending the dignity which all human beings share in equal measure. Certainly, we should be concerned lest other living beings be treated irresponsibly. But we should be particularly indignant at the enormous inequalities in our midst, whereby we continue to tolerate some considering themselves more worthy than others." (LS 90; similar LS 119).

Of course, it is absolutely true that a commitment to the environment cannot justify the neglect of human rights and interpersonal justice. And it is probably also true that some radical environmentalists do exactly this by referring to the equality of all living beings. But the basic biocentrist

idea of the equality of all living beings actually says something different. In this respect, LS 118 is more cautious and therefore more accurate: "This situation has led to constant schizophrenia, wherein a technocracy which sees no intrinsic value in lesser beings coexists with the other extreme, which sees no special value in human beings." This suggests that the denial of human usually goes hand in hand with that of creaturely dignity: Those who treat human beings primarily or exclusively as commodities with a price will do the same with non-human creatures and vice versa.

A significant *spiritual depth dimension* shines forth when in a few passages reference is made to the fact that *the "incarnate", i.e. creatural, "Christ* has taken unto himself this material world and now, risen, is intimately present to each being, surrounding it with his affection and penetrating it with his light." (LS 221). He has thus become the "seed of definitive transformation" of the entire universe (LS 235). Here Francis explicitly refers to Teilhard de Chardin: "The ultimate destiny of the universe is in the fullness of God, which has already been attained by the risen Christ, the measure of the maturity of all things." (LS 83). The interpretations of the Colossian hymn (Col. 1:15–20) and the Logos hymn (Jn. 1:1–18) in LS 99 are particularly dense: "One Person of the Trinity entered into the created cosmos, throwing in his lot with it, even to the cross. From the beginning of the world, but particularly through the incarnation, the mystery of Christ is at work in a hidden manner in the natural world as a whole." Christian anthropology often points out that in the incarnation of God the dignity of the human being shines forth in a unique way. By analogy, one would have to draw the conclusion from the papal interpretation of the incarnation as creature incarnation that in it the dignity of creatures shines forth in a unique way.

An encyclical is not a scientific theological treatise and therefore enjoys the right to remain somewhat fuzzy conceptually and argumentatively. Pope Francis is recognisably trying to preserve the concern of classical anthropocentrism, to protect human dignity and to stand up for interpersonal justice, on the one hand, and to combine it with the concern of biocentrism and ecocentrism, to respect the inherent value of creatures and to fight for justice towards all creatures, on the other.

Especially when, like Pope Francis, one thinks of Creation ethics and incarnation together, strong arguments arise for biocentrism. Incarnation means "taking on flesh", the becoming of God as a creature (Sallie McFague 1993, 131; Michael Rosenberger 2001a, 20). God becomes solidarity with all creatures—in being born, in living and in dying. God's incarnation has a dynamic that is strongly driven by his compassion for

creatures and urges us to be compassionate too (Robert Shore-Goss 2016, 124 and 128): "Jesus is the incarnate and compassionate face of God. He invites us, 'Be compassionate as Abba God is compassionate' (Lk. 6:36)." (Robert Shore-Goss 2016, 126). Man is called to an "incarnational compassionate care for the least among humanity and other life." (Robert Shore-Goss 2016, 146)

In contemporary devotion to the Stations of the Cross, this idea of the co-suffering God has experienced analogous theological expansion. Roland Peter Litzemberger's pen and ink drawing of the crucified Christ in the outline of a dolphin "dying of poison and dirt" (1974), Adolfo Pérez Esquivel's depiction of the crucifixion, which places the crucified Christ against the backdrop of the exploited and destroyed globe, or the X. Station of the Cross by the same artist, in which the robbery of the clothes of Christ is depicted in the midst of the destroyed rainforest, the garment of the earth (both 1993), are well-known examples of this broadening of horizons (Michael Rosenberger 2001a, 70). A parallel to this is offered by the artist Deborah Sengl's "Via dolorosa" from 2012, which is worth seeing. In the classic 14 Stations of the Cross, she replaces the figure of Jesus with a chicken, thus drawing attention to the connection between the suffering of Jesus and the suffering of animals in intensive livestock farming (Deborah Sengl 2012). This is similar to what Pope Francis writes at the end of his encyclical on Creation: "Mary, the Mother who cared for Jesus, now cares with maternal affection and pain for this wounded world. Just as her pierced heart mourned the death of Jesus, so now she grieves for the sufferings of the crucified poor and for the creatures of this world laid waste by human power.." (LS 241). And the Ecumenical Assembly of Dresden already stated in 1989 (EAD 1/(46)): "In the cross of Jesus as the non-violent end of violence there is thus also hope for fellow creatures."

Tendency-wise, then, the trend of current Creation ethics and Creation spirituality, despite some remaining plurality, is towards holistically based biocentrism, as I have philosophically justified. Theology and spirituality can underpin this trend with the following considerations:

- *Theology of Creation*: Everything is directly created by God and found to be good. To call the world we find Creation is to claim its ethical incalculability in the name of God. At the same time, the world is interpreted as borrowed from God. It is not a human possession, but a loan in human trusteeship. Something borrowed is treated with particular care, so that the theology of Creation can more forcefully underpin the respect for the world that was previously philosophically justified as respect for Creation.

- *Creation ethics*: All living beings are interconnected, dependent on each other and are in the same lifeboat of the ark. They are all God's covenant companions, brothers and sisters of a universal family and thus addressees of justice (moral patients).
- *Soteriology and Christology*: All living beings are included in the mystery of the suffering, dying and resurrecting of Christ. For ethically acting believers, it is therefore a matter of recognising Christ in their needy fellow creatures. The sentence that is so significant for Christian spirituality is to be extended to all creatures: "Amen, I say to you: Inasmuch as ye have done it unto one of the least of these my brethren, ye have done it unto me." (Mt. 25:40)

Against this background, the threefold potential of the Christian faith for generally human, philosophically based environmental ethics now also becomes clear. It

- *criticises* anthropocentrism, which, although reasonable, comes across as too self-evident and self-assured, and its natural tendency towards technocratism.
- *inspires* the search for the ever "greater justice" (Mt. 5:20), which is never satisfied with the already recognised (interpersonal) standards of justice.
- *integrates* the cool world view of philosophy into a deeper view of reality as a mystery to be respected shyly and reverently.

5.5.6 The emotional power of holistically based biocentrism and its spiritual deepening

The world stands at the abyss. And at least the courageous, like us in chapter 2, are looking into this abyss. Consequently, the goal of environmental ethics must be to show ways and means to slow down the current force of economic and technological rationality and to take away its dominance over all social processes (cf. chapter 2.8). In view of this enormous task, an ethical approach that recognisably plays down rather than dramatises will only contribute to maintaining the status quo. To put it very clearly: the cool apathy of stoic anthropocentrism may have a rational plausibility, but due to its lack of emotion, it will not initiate change. For this, emotionalisation is necessary—in connection with a considerable broadening of horizons. What is needed is an ethical approach that invites and enables people to put themselves in the shoes of an animal or a plant.

Pope Francis is absolutely right when he stresses that the solution cannot be expected from doctrine alone—neither an anthropocentric nor a non-anthropocentric one. Because: "More than in ideas or concepts as such, I am interested in how such a spirituality can motivate us to a more passionate concern for the protection of our world. A commitment this lofty cannot be sustained by doctrine alone, without a spirituality capable of inspiring us, without an 'interior impulse which encourages, motivates, nourishes and gives meaning to our individual and communal activity' (EG 261)." (LS 216) It is therefore all the more necessary to ask which philosophical doctrine is most open and affinitive to spiritual motivations. And here the biocentric and ecocentric approaches are ahead (Haydn Washington et al. 2017, 39).

It must not be misjudged that the philosophical concept of dignity is not primarily a rational principle of action, but an emotional inhibition, for granting dignity to someone means: "Stop! Stop and look at the dignitary from the other, non-benefit-oriented perspective! Perceive him or her as an independent you with his or her own needs!" The attribution of dignity, on the other hand, contributes little to determining the content of rules of action in conflicts over goods. Rationally argumentatively, recourse to it would be dispensable, which is also what many advocate. The reference to human rights is quite sufficient and does not require a reference to dignity. But without the mention of dignity, much of the emotional charge would be lost. The importance and urgency of the issue would be downplayed. This is precisely where the importance of granting dignity to all creatures, not just all human beings, lies. Talk of "dignity" is a signal booster of the first order.

This is all the more true when the theological concept of the brotherhood and covenant of all creatures is used in addition to the philosophical concept of dignity. It evokes vivid images that are understandable to everyone and is thus even more holistically appealing. It is not for nothing that Friedrich Schiller uses the metaphor of all people becoming "brothers" (and sisters) in his "Ode to Joy" to illustrate human dignity. And in the setting in Ludwig van Beethoven's Ninth Symphony, Schiller's "*all* people" is emphasised through uncounted repetitions as the egalitarian core of the idea. So, both use a more passionate spiritual metaphor instead of a cooler philosophical one.

When Heike Baranzke (2015, 57) assumes that "proclaiming an animal dignity would not lead anywhere either", purely on the argumentative level she may be right. Argumentatively, animal and environmental protection can be justified anthropocentrically as well as biocentrically or

ecocentristically. But I think it is naïve, if not negligent, to exclude the emotional side so completely, for anthropocentrism (cf. Michael Rosenberger 2001, 162–163)

- tends to trust more in *technical rationality* and is more seduced by the "technocratic paradigm" than biocentrism or ecocentrism. It tends more to overestimate the human knowledge of natural processes and the human possibilities of managing nature.
- tends towards the all-dominant *economistic thinking* that sees the ecosystem only as "natural capital" and at best protects it for the sake of long-term economic consequences. According to Kant, however, the concept of dignity is exactly the opposite category to measurable and scalable monetary values. It sets the ethical perception of dignity bearers exactly against the economic calculation—knowing full well what power the latter possesses.
- is more easily seduced into *chauvinism* by deriving primarily rights and hardly any duties from the special position of humans, thus subordinating non-human living beings on principle.

Holistically based biocentrism, on the other hand, will apply the traditional precautionary principle, which, in principle, anthropocentrism also recognises, more readily and comprehensively and thus proceed more cautiously and in a more error-friendly manner: It is more inclined to humble acknowledgement of the limits of one's own knowledge and ability and to reverent wonder before the immeasurable mysteries of the cosmos. In view of the enormous requirements for the preservation of an earth worth living on, this is a strong argument for holistically based biocentrism.

5.6 Moral individualism and the common good principle

How can the needs of individuals and systemic requirements be mediated in an ethical judgement? This question, which has already come up several times, will be discussed in this second step. It is a problem that all four approaches to justification have to face. Bryan G. Norton (1984, 133) is even convinced that alternative anthropocentrism or non-anthropocentrism is less significant for environmental ethics than the alternative moral individualism or moral non-individualism. Even though I do not want to participate in this comparison: the question of how individual and collective good can be balanced in an ethical judgement is a difficult and, at the same time, pressing question.

Often, individualistic and systemic approaches stand head-on against each other. Ecocentrism sees itself as a break with the tradition of the other three approaches, which are united by their focus on the individual. But the more individualistic approach to animal ethics and the more systemic approach to environmental ethics will not find common ground as long as the question of their methodologically coherent mediation remains unresolved. So, what might a solution look like (cf. Michael Rosenberger 2018, 124–135)?

In a first step, the question arises as to which norm-ethical theory group is at all capable of establishing such a connection between individualistic and systemic perspectives. The pathocentrist approaches, i.e. utilitarianism and animal rights approaches such as Tom Regan's, do not manage this because both varieties are exclusively individualistic in their 'genetic code'. Utilitarianism replaces the traditional principle of the common good with the principle of maximising the sum of benefits ("the greatest happiness of the greatest number"). In this principle, the collective is considered only as a sum of individuals. The relationships between individuals, on the other hand, play no role. In animal rights approaches, individual rights are at the centre. Here, too, the common good orientation of classical ethics has no place by definition. The pathocentrism developed so far are therefore pure individualism.

The situation is different in the large family of theories of justice, which regard justice that transcends the individual and are oriented towards the common good as the supreme principle of ethics. Whether they are more strongly influenced by natural law (as in Aristotle, Thomas Aquinas or Martha Nussbaum) or whether they argue more strongly in terms of contract theory (as in the Hebrew Bible, John Rawls or Jürgen Habermas), they fundamentally strive to combine an individualistic and systemic view. The individualistic view comes to the fore primarily through the contract situation (the "original state") and the rights resulting from it, the systemic view through recourse to 'nature' or 'general facts', which even modern contract theories cannot do without. In principle, theories of justice have long sought to mediate individual and systemic aspects, even if they do so more or less thematically and reflectively.

Now, both anthropocentrism and biocentrism in their dominant forms can be assigned to the theories of justice. Both aim at fair trade-offs and comprehensive justice between all moral patients. Before we examine how they determine this, however, it is helpful to return to a consideration that helped the young John Rawls to initiate his change of sides from utilitarianism to justice theory, for on the one hand, it makes the misun-

derstanding of utilitarianism clearer, and on the other, it clarifies what a good theory of justice must necessarily take into account. It was Rawls' great "aha" experience during his theory-building which revealed that instead of isolated consideration of individual actions or norms, as is usual in utilitarianism, the *holistic consideration of rules within the systems of rules* in which they are embedded must take place. Rules are part of a "practice" and cannot be understood at all without taking this practice into account. This is how Rawls formulated it as early as 1955 in his famous, still utilitarian essay "Two Concepts of Rules". In the theory of justice, two decades later, this becomes the fundamental option of focusing the material object on just institutions (John Rawls 1975, 23–27, § 2). Institutions are systems of rules. The parties in the original state cannot choose individual rules, but only packages of consistent rule systems, i.e. institutions. This prevents cherry-picking, which has drastic consequences for animal and environmental ethics.

The *concept of system* originates from systems theory, which was first developed in the mid-20th century by biologists (Ludwig von Bertalanffy, Humberto Maturana, Francisco Varela) and cyberneticists (Norbert Wiener, William Ross Ashby) and was soon transferred to sociology (Talcott Parsons, Niklas Luhmann). In addition to the analytical, descriptive potential of the system concept, its normative, prescriptive potential was also increasingly recognised, so that today the systemic approach has also found its place in (psycho)therapy and (social)ethics. The term "system" is used to describe a totality of elements that are interconnected and seen as a structured unit. A system therefore comprises individual elements, their relations and the structural laws of these relations. In this respect, a systems theory goes beyond relationist theories in two ways: on the one hand, it considers not only certain, quasi-personal relations (such as that between a dog and a human being), but also apersonal ones (such as that between a tree and the nutrients it takes from the soil). On the other hand, the structural laws of the relations are also taken into account (such as the fact that an animal must eat other creatures if it wants to survive itself).

So how can individual and systemic requirements be combined in an ethical judgement? In order to answer this question, it is of great importance to first recognise the *irreducibility of the individualistic and systemic perspectives to each other* and thus their inherent normative autonomy. The individualistic and the systemic perspectives are, in principle, not reducible to each other, but represent two independent, legitimate and, from an ethical point of view, necessary perspectives on reality. A system is something other than the sum of its individuals, and an individual is

something other than the smallest part of a system. For this reason, individualistic and systemic perspectives can and must (!) complement each other. The either-or must become a both-and. Adequate environmental ethics necessarily needs a duality of perspectives. The individual perspective is about inter-individual distributive justice; the systemic perspective is about inter-systemic allocation. Under this second perspective, there are "generalised obligations". These are obligations of the present generation to ensure a stable flow of resources in the future to ensure the continuation of life. This keeping open of systemic options is the condition of possibility for individual needs to be met in the future (Bryan G. Norton 1984, 144).

In biocentrism, as in all models of moral individualism, but unlike ecocentrism, systems are not valuable in themselves, but only for their members. Systems therefore have no "inherent value", only "utility value". There is a *primacy of the individual*. At the same time, however, ecosystems are conditions of possibility for the individual well-being of their members. So, there is a *priority of the ecosystem*. It is precisely this tension that I try to express in holistically based biocentrism.

The classification of biocentrism among forms of moral individualism does not prevent it, due to its holistic foundation, from considering certain systems, i.e. populations, species, communities, ecosystems and biomes as "quasi-personalities". By analogy with law, ethics can distinguish between natural persons, i.e. real individuals, and "quasi-personalised" institutions, i.e. systems. Such systems are presented as analogous to persons, as if they were individuals. They have clearly defined rights and duties; they enjoy a moral status. But biocentrism ascribes dignity only to natural persons—only they deserve to be preserved and respected for their own sake. Institutions, on the other hand, are ascribed moral status a posteriori; a priori, they have no inherent value. They are, however, of paramount importance for the common good of living beings because they are the condition of possibility for the individual good of their members. As in law, this can sometimes even mean that the system takes precedence over the individual.

How do theories of justice solve conflicts between individuals and systems? The basic form of such solutions is always the weighing of goods. If we take Rawls' understanding of the system of rules seriously, these are never exclusively trade-offs between the goods of individuals, for systems also need goods in order to be maintained. Weighing up goods therefore weighs up goods

- of different individuals among each other,
- of different systems with each other and
- of individuals and systems with each other.

In the third case—and this is the one that is interesting for us—the classic rule of balancing the common good is applied in the interpersonal sphere: "Provided that the dignity of the person is respected, the claims arising from the community take precedence over the claims of the individual in the case of conflict". (Wilhelm Korff 1995, 1119). In short, provided that every individual is formally treated equally without regard to the person and is not completely put to use, the common good takes precedence over individual welfare. This is compelling because the individual depends on his or her community, but the community does not depend on a specific individual. Therefore, it is reasonable to give priority to the community, i.e. the system, when allocating goods materially¹⁶. Formally, the individual has primacy over the community through the principle of equal treatment and the prohibition of total instrumentalisation. Materially, the community has priority over the individual with regard to the allocation of goods.

At this point, the *distinction between group utility and third-party utility* becomes important. If it is necessary to deny or even deprive a group member of certain goods in order to preserve the group, then this is justified as long as the individual who has to make the sacrifice is determined without discrimination. Thus, it benefits the population of a country as a whole if the vulnerable groups are vaccinated against Covid-19 first. Those who do not belong to these groups can be required to wait for vaccination for the sake of the common good—at the risk of falling ill and dying during the waiting period. Analogously, sustainable hunting that adjusts population size to the capacities of the ecosystem benefits the individual deer or roe deer as a member of that system—even though it may mean the individual "total loss" of being shot down (James Sterba 1995, 192). In the case of both inoculation against the coronavirus and hunting, the survival of the system comes first, for which the individual must put aside his or her needs, for without the preservation of the system, the individual's existence would also be endangered. Both times it is an indispensable condition that there is "no respect for the person". In the case of inoculation against the

16 Karlheinz Ruhstorfer 2012, 263 and Valentin Zsifkovits 2012, 83 emphasise that the common good is not the sum of the individual good of individuals, but their structural, systemic condition of possibility, with reference to various papal doctrinal letters as well as the texts of the Second Vatican Council.

coronavirus, for example, this corresponds to the prohibition of favouring powerful or rich people; in hunting, it corresponds to the refusal to preferentially hunt trophy bearers.

So far, we have only looked at the trade-off between the goods of individuals and the system that embeds them. However, there are also cases where the treatment of individuals has an impact on completely different systems. Extensive grazing, for example, greatly promotes biodiversity and builds up humus at the same time, quite the opposite of agricultural cultivation of food crops. Now, biodiversity and humus build-up benefit the broader regional ecosystem. This benefits people, livestock and wildlife. Again, this is about the realm of group utility. Just as humans are expected to designate nature reserves for the sake of biodiversity and thus make a 'sacrifice', analogous 'sacrifices' can be expected from farm animals, for which the keepers provide a good life in a biodiverse environment.

But what if it is not the benefit of a wider system that is at stake, but that of *another subsystem at the same level*, in which the individual in question is not involved and from which consequently neither he himself nor his species nor his ecosystem will ever benefit? Do fish, for example, have to 'sacrifice' themselves for the sole purpose of being able to feed humanity? As long as fishing is sustainable and done in such a way that fish stocks remain stable, fishing also serves the fish themselves and is beneficial to the group. Currently, however, the world's oceans are being overfished. Could feeding humanity be a legitimising reason for this? Systemically, one could argue against this that humanity is also only served in the very short term if the oceans are fished dry. But here I see a prerogative of moral individualism: a sacrifice cannot be demanded from the one who does not benefit in any way from the targeted good. For such a sacrifice would be exclusively altruistic, and altruistic action can only be given freely and never demanded or imposed by third parties. The cod is interested in the survival of its species and the preservation of its marine ecosystem. But it is not interested in the survival of humankind.

The "common good before individual good" therefore only applies where the individual is part of the community in question and group benefit exists. As soon as there is a purely external benefit, the principle of the common good of balancing interests comes to nothing. In the sense of the *biocentric egalitarianism of all living beings*, this also applies where plants or animals are supposed to be of use to others. In contrast to anthropocentrism, this cannot be demanded. This is perhaps the most important material difference between the two approaches—it is significant and perceptible, but not fundamental, as some anthropocentrists believe.

The interpretation of the principle of the common good of classical social ethics in terms of system preservation and the distinction between group and third-party utility thus allow for a sufficiently coherent and appropriate combination of individual and systemic requirements within the framework of environmental ethics. Classical theories of justice do not need a new conception, but only the expansion of individuals with moral status in order to transform moral individualism that ignores the common good into common good-oriented moral individualism.

5.7 Epilogue: Being born and dying as cornerstones of ethics of Creation

The example of the coronavirus vaccination shows how much the social debates of Western industrialised countries have developed towards pure individualism in recent decades: The common good is no longer accorded any fundamental importance; it is merely a necessary evil and an obstacle to the realisation of the individual good. The enormous state aid for companies and their employees in the coronavirus crisis will probably not change this. How deeply pure individualism has now taken root in our thinking can be seen in the jurisprudence of the constitutional courts, which are finding fewer and fewer arguments as to how they can adequately position the common good as the counterpart with equal rights to the individual good.

One consequence of individualism that ignores the common good, and a very symptomatic one at that, is that the prohibition of killing humans as well as animals or plants is completely torn out of its systemic contexts.

- In all three approaches to the justification of moral individualism, there is a tendency today to discuss the killing of people on demand in purely individualistic terms and to overlook the fact that such killing has repercussions for those around the person concerned, indeed for society as a whole.
- In anthropocentrism, the (painless) killing of animals and plants is hardly problematised; in pathocentrism, on the other hand, the killing of animals is elevated to the main problem and that of plants is faded out.
- What is usually overlooked is that killing is the taking of a quantifiable and to be quantified good. It is not "life" that is taken away, but a (prognostically assessable) very specific lifespan with a very specific quality of life. Therefore, not everything is taken from a living being with its killing, but something, because no one can take away the

lifespan that has already been lived and the experiences that have been had during this lifespan.

- The fact that killing can even be a consequence of respect for the dignity of the individual who is killed plays no role at all in current debates (Michael Hauskeller 2015).
- Finally, moral individualism quickly forgets that no animal, not even the animal *homo sapiens*, can do without consuming organic matter. Human and non-human animals live from the fact that other living beings die. And we must go even further: new living beings can only be born when old living beings make room and die because the earth's resources are limited and can only support a limited number of living beings.
- The recognition of the natality and mortality of all living beings is a spiritual or virtue-ethical prerequisite for conducting objective discussions in this field. Every living being, whether plant, animal or human, is constantly dependent on an environment that keeps it alive. But this is only possible if all living beings also leave when the time comes. It does not matter which approach to environmental ethics one follows: Without humility, the basic attitude of *ars moriendi*, nothing meaningful can come into being.

As significant and indispensable as the idea of a unique individual with inalienable dignity is, it is equally problematic that its embeddedness in a larger whole is almost completely ignored in current social and scientific discourses. Here lies the deeply justified and pressing concern of *ecocentrism*, which we can no longer ignore. This is also the basis of my plea for holistically based *biocentrism*.

An old story tells how two Buddhist monks look at the earth. Reproachfully, one says, "Look how they're eating each other!" The other shakes his head and replies: "They don't eat each other—they feed each other!" (Roger S. Gottlieb 1999, 160) In reality, and this is the typical punchline in Buddhist stories, both monks are right. They represent two well-founded and unrefutable perspectives on how we can and must look at the world. One perspective is that of scarce goods for which there is fierce competition. The other perspective is that of abundance, which gives us the freedom to love one another and give ourselves to one another. Much would be gained if we were to put the currently dominant first perspective on an equal footing with the second, which has fallen by the wayside.

6. Thinking of children and grandchildren. Sustainability as intergenerational justice

In the preceding chapters, we have laid the foundations for a Christian Creation ethic. At the same time, it was clear from the first chapter that the enormous dominance of the economy must not be overlooked if real solutions are to be found. So how can the insights gained from environmental ethics be transferred to economic and social concepts? How can we succeed in combining environmental and economic policy? Since the 1980s, this question has been answered by the concept of sustainable development. In a good three and a half decades, it has become very popular and has spread worldwide—but at least in the ecological field it has not yet had much effect. Perhaps these two observations are more closely and deeply connected than one might think: Is the reference to sustainable development perhaps so popular precisely because the concept is dazzling and everyone can extract from it what suits him or her?

As will be shown, there is some truth in this assumption. Nevertheless, Markus Vogt is right when he classifies the principle of sustainability as a "missing link' between faith in Creation and the social discourse on environment and development" (Markus Vogt 2016, 132). For the faith in Creation needs translating into the structural logic of society, politics and economy. Conversely, social structures need a depth dimension in order not to fall into a "flattening into mere management rules" (Markus Vogt 2016, 132).

Not only does the sustainability principle act as a link between faith and society, but also between the economy, ecology and social issues, as well as between ethics and politics. Basically, the sustainability principle is the link between the most diverse social subsystems, scientific discourses and ideological convictions. Everyone can agree on the principle of sustainability. However, links are not easy to grasp. That is why in the following chapter I will look at the history and content of the concept of sustainability in order to then explore its concreteness for climate protection, biodiversity conservation and population policy. Finally, it can be stated more precisely what significance sustainability can have in the overall context of a Christian Creation ethic.

6.1 History of the concept and idea of sustainable development

To begin with, the history of the concept and idea of sustainable development should be outlined (cf. e.g. Helga Eblinghaus/ Armin Stickler 1996, 37–47; Hans J. Münk 1998; Markus Vogt 2009, 110–133 and most recently Ben Purvis et al. 2019). "Sustainable development", sometimes also translated as "future-proof" or "permanently environmentally sound development", contains two elements of very different origin:

Sustainability (German *Nachhaltigkeit*) is a term originally used in general language that became established as a *terminus technicus* in German forestry in the second half of the 18th century (Herbert Killian 1994). The background to this was the devastating overexploitation of forests in the 16th and 17th centuries, caused by the extreme expansion of salt, metal, porcelain and glass processing, which at that time still had to satisfy its enormous energy needs largely with wood. German forests were "fairly filled with bare patches" (Hans Carl von Carlowitz 2013, 113). This catastrophic damage to the economic basis of the burgeoning industry that accompanied the overexploitation and destruction of the forests coincides in terms of the history of ideas with the Enlightenment's claim to want to ensure humanly comprehensive progress through long-term and sensible planning.

In this sense, the Saxon chief miner Hans Carl von Carlowitz (1645 Oberrabenstein–1714 Freiberg/Saxony) asks in his work "*Silvicultura oeconomica*", published in 1713, "how to achieve such conservation and cultivation of wood / that there is continuous, constant and sustainable use / because it is an indispensable thing / without which the land may not remain in its esse [= being]." (Hans Carl von Carlowitz 2013, 9 and 216) Sustainability here is a forestry concept intended to ensure the lasting economic use of the number one energy resource. At the same time, however, Carlowitz is driven by a strong religious, pietistic motivation (cf. Joachim Hamberger in: Hans Carl von Carlowitz 2013, 45): the first words on the title page of the book are "with God" (Hans Carl von Carlowitz 2013, 93), the first letters of the preliminary report "B.C.D." (Hans Carl von Carlowitz 2013, 97), i.e. "bono cum Deo", "with the good God"¹⁷. God himself is mentioned 130 times in the text of the book (Joachim Hamberg-

17 Joachim Hamberger (in: Hans Carl von Carlowitz 2013, 45 footnote 196) translates the expression as "on good terms with God", but this fails to recognise the inversion common in Latin. The phrase "bono cum Deo" was an established idiom after the time of Renaissance humanism.

er, in: Hans Carl von Carlowitz 2013, 45). Above all, however, after a brief description of the situation, Carlowitz immediately turns to the question of "special respect for forests and trees" in the second chapter of the book (Hans Carl von Carlowitz 2013, 114–126). Carlowitz demands this respect by referring to pagan cults, but also to Greco-Roman philosophy and the Bible. He is aware that an approach oriented purely towards economic benefit is hardly sufficiently motivating to manage forests sustainably.

Carlowitz's solution to the problem of sustainability in a forest is comparatively simple: the utilisation rate, i.e. the amount of wood removed from a forest, must not exceed the regeneration rate, i.e. the amount of wood that grows in the same period. Despite this simple and plausible consideration, it took a long time for the concept to spread. In the end, its road to success only began when, thanks to the spread of the railway, hard coal could be transported over long distances and subsequently replaced wood as the primary energy source (Herbert Killian 1994). At this time, namely during the Romantic period, people began to rave about German forests and to ascribe aesthetic and spiritual values to them beyond economics. As a result, the ecological dimension of sustainable forestry also gained more attention. During his visit to the forestry faculty in Tharandt/Saxony, the American eco-pioneer Aldo Leopold (cf. chapter 5.4) finally got to know the concept.

Development, the second paradigm, has conquered economics, sociology and biology, and from there most other branches of science, especially since the 19th century. Charles Darwin's theory of evolution, for example, would be inconceivable without thinking in terms of development. As a rule, the term is understood in an optimistic, linear way and uncritically interpreted as development for the better. It also leads to a one-dimensional understanding of development as a purely economic and technical variable. Beyond these examples of one-sidedness, however, the paradigm of progress can guide action in a positive way. At any rate, this is the idea behind Paul VI's 1967 encyclical "Populorum progressio on the development of peoples", which critically interprets the idea of progress and development, breaks down its economic, materialistic and Eurocentric limitations, and calls for holistic human development (PP 14; 34).

In the 1970s, a transfer of the two concepts of *sustainability and development* took place, which aimed to make them jointly fruitful for the challenge of global environmental problems. In June 1972, the "UN Conference on the Human Environment" convened in Stockholm, the first world summit dedicated to ecological issues. Its basic idea was to make the desired development of the poorer countries environmentally

friendly. A quarter of a year earlier, in March 1972, the Club of Rome had presented its study on the future of the world economy, prepared at the Massachusetts Institute of Technology, entitled "Limits to Growth". The term "sustainable" appears in it a total of seven times (Donella H. Meadows et al. 1972, 24,157–158, 165, 168–169). The study hit the entire Western world like a bomb and created a snowball effect (Ben Purvis et al. 2019, 682). Thus, as early as 1974, the World Council of Churches' commission "The Future of Man and Society" spoke of the goal of a "just, participatory and sustainable society" (Markus Vogt 2009, 25, 180–181).

With the so-called Brundtland Report "Our Common Future", published in 1987 by a UN commission chaired by Norwegian Prime Minister Gro Harlem Brundtland, the concept of *sustainable development* established itself as the central paradigm of the environmental debate. Sustainable development is a formulaic compromise that bridges the very contradictory views of the eleven members from industrialised and developing countries respectively. Its approach is based on the realisation that only an economic and social order that is oriented towards international and intergenerational justice and takes into account the finiteness of nature is sustainable. Although the solution to the problem was, at most, rudimentarily considered in the report, the perception of the problem was conceptually fixed and a paradigm shift in environmental and development policy was initiated. From then on, the two fields belonged inseparably together.

The *ecumenical assemblies of the conciliar process* in Dresden and Basel in 1989, which took place a little later, explicitly cite the Brundtland Report (EAD 10/(1), (7) and (23) as well as EAD 11/(10), EEA 87d and j). However, while Dresden uses the Brundtland Report from the beginning as one of the supporting bases of its analyses and approaches to solutions, in Basel the report was only introduced into the final text at the last moment, which prevents it systematically penetrating environmental ethical reflections from the idea of sustainability. In the ecumenical assembly of Stuttgart in 1988, the term sustainability is not used, but the idea of sustainability runs like a thread through the document. Sustainable development thus became the guiding principle of Church statements as late as in the 1980s, shortly after the publication of "Our Common Future", which is a sign of its resounding impact.

The Brundtland Report clearly understands sustainable development as development with economic growth (cf. chapter 8.4). For poorer countries, this is understandable and probably also correct, but it is understood globally in the report. It says: "What is needed now is a new era of economic growth—growth that is forceful and at the same time socially

and environmentally sustainable." (United Nations 1987, 7) Because of this growth orientation, the World Council of Churches has withdrawn from further sustainability discourses (Markus Vogt 2009, 162). This is because a decided orientation towards growth runs diametrically counter to the original idea that sustainability means the recognition of "limits to growth". "Instead of suggesting a society should live within limits, the term 'sustainable' now calls for evading limits, making economic growth sustainable." (John B. Cobb 2005, 1613)

At the *UN Conference on Environment and Development* (UNCED) in Rio de Janeiro in 1992, sustainable development was further upgraded: Agenda 21, which was adopted there, elevated the concept to a central political guiding principle, which is now also considered a *solution approach* and is to encompass all policy areas as a cross-cutting issue. Not only is environmental and development policy to be placed under the guiding idea of sustainable development, but so is policy as a whole. This is a qualitative redefinition and not only a quantitative expansion of the concept (Hans J. Münk 1998, 234). The ecological question is taken out of its isolation and embedded in an overall concept of ethics or politics.

More than twenty years after Rio, the term and concept of sustainable development were incorporated so naturally into Pope Francis' 2015 *encyclical Laudato si'* that no major explanations are needed. The Pope intends "to bring the whole human family together to seek a sustainable and integral development" (LS 13; cf. also LS 18; 52; 102; 207). Such a development includes, on the one hand, the integration of ecological concerns into social and economic processes (LS 141 with reference to Principle 4 of the Rio UNCED) and, on the other hand, "solidarity between generations" (LS 159; 192). A special concern of Francis is sustainable agriculture (LS 164; 181) as well as the "sustainable use of natural resources" (LS 191; 140). Contrary to the "great acceleration" (cf. chapter 2.6), sustainable development can sometimes mean a deliberately slowed down development (LS 193). Finally, a few months before the climate conference in Paris in 2015, the Pope urges us to finally implement the impulses of the UNCED in Rio (LS 167; 169). By taking up two principles from Rio, Francis fully joins the concern of the international community in terms of content (LS 141 cites Principle 4, LS 186 Principle 15). From the highest level, the Church is (finally!) joining the great alliance of governments, non-governmental organisations and societies forged in Rio.

The idea of so-called "*Sustainable Development Goals*" (SDGs) was conceived at the Rio+20 Conference in 2012, and the "2030 Agenda for Sustainable Development" was adopted at a UN summit at the end of

September 2015. All 193 member states of the United Nations committed to working towards achieving the 17 SDGs with a total of 169 targets by 2030. Measuring instruments are to continuously map the progress of the individual countries and make it verifiable. In principle, this is a progress. However, the 17 goals and 169 sub-goals are not only confusing, but also have a considerable bias in favour of economic and social sustainability and against environmental sustainability. This is exacerbated when one analyses the prioritisation of the goals, which corresponds to their numbering: ecological sustainability comes into play for the first time under Goal 6 "Clean Water" and Goal 7 "Clean Energy"—two environmental goals that are clearly anthropocentrically conceived in the targets. Climate protection as a concern that can be interpreted either anthropocentrically, biocentrically or ecocentrically is far back in the catalogue as Goal 13. And the only two decidedly biocentric or ecocentric goals 14 "Life under water" and 15 "Life on land", which address non-human life, are almost at the bottom of the ranking. Only Goal 16 "Peace, justice and strong institutions", which is most contested between rich and poor countries, and Goal 17 "Partnership for the Goals", which is inevitably in last place for formal reasons, are still behind.

So far, there has been no profound scientific reflection on the rationale and architecture of the 17 goals. The scientific community has jumped on the SDG bandwagon very pragmatically (in part also imposed from above or lured with research funds) and uses it to fund research projects for the implementation of individual sub-goals, but does not question their overall architecture and the guiding vision of the 17 goals. This is a glaring deficiency seven years after their adoption. The evaluation of the SDGs poses a classic dilemma for environmental ethics: if it is too negative, it will contribute to the non-implementation of the goals, which no one can wish for. If it is too positive, it will help to cement ecological underexposure. Of course, it is good that a way has finally been found for all nations to work together on meaningful goals and hold each other accountable, but ecologically, the SDGs are very deficient. It will be necessary to examine how far this is due to the overall concept of sustainable development, which will be subjected to systematic reflection in the following section.

6.2 *Systematic reflection on the concept of sustainable development*

How can the concept of sustainable development be defined more precisely in terms of content? We can by no means trace here the highly complex

and extraordinarily multidisciplinary discussions that have taken place since 1987. In them, scientific, technological, economic and social options merge into an amalgam, the presentation of which would far exceed our scope. Thus, only a few core elements and options can be pointed out and discussed.

Four problems arise with the extension of the forestry sustainability concept to the earth's ecosystem (Hans G. Nutzinger 1997, 273–274):

- 1) With regard to *fossil raw materials*, it is impossible in the short and medium term to realise sustainability as defined by Carlowitz, because this would entail the total renunciation of these resources. This is because fossil raw materials grow so slowly that their rate of use would have to be zero.
- 2) The concept of sustainability in forestry refers to a single raw material: wood. At best, it will be differentiated according to different types of trees and wood. If sustainability is to become an overall concept in dealing with the earth's ecosystem, however, one has to deal with an *infinite number of different raw materials*. At the same time, the complex material interactions must be taken into account: There are considerable feedback effects between individual ecological systems via water, soil and air. Moreover, the different raw materials can be substituted for each other to some extent. As a result, the concept of sustainability loses its simplicity as well as its precision.
- 3) In addition, the *interactions of different actors* need to be considered. Assigning responsibility for global environmental degradation is extremely difficult. While a forest is private property and the responsibility for its sustainable use can be assigned to the forest owner, the goods of a healthy environment are almost exclusively public goods. They belong to everyone, and everyone shares responsibility. This, however, makes the attribution of responsibility difficult (cf. chapter 8.1).
- 4) While Carlowitz conceived the sustainability concept in purely economic terms and ecological and social consequences came into view only in this perspective, i.e. indirectly, the *expansion of the sustainability concept* goes beyond the purely economic framework. Ecological and social aspects come into view as independent perspectives for their own sake and demand a solution. This raises the question of how the three dimensions of the economy, ecology and social affairs relate to each other.

To see the term sustainability as "a landfill for all ecosocial wish lists" (Robert Goodland/ Herman Daly 1996, 1002) does not seem entirely absurd. Some scholars recognise an oxymoron, a contradiction in terms in

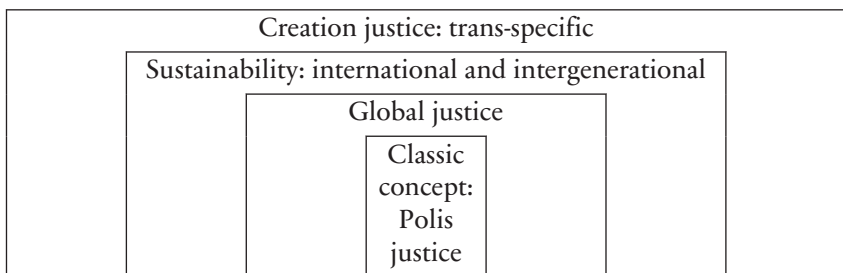
the combinations "sustainable development" and/or "sustainable growth" (Herman E. Daly 1991, 401–407; likewise Robert Goodland/Herman Daly 1996, 1003; cf. Ben Purvis et al. 2019, 691). As promising as the concept of sustainability may have seemed at first, it is proving difficult to adapt it to our global ecological challenges.

6.2.1 Sustainable development as a concept of justice

The Brundtland Report's definition of sustainable development has become widely accepted: Sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (Volker Hauff 1987, 46)

Although this definition is rather formal in character and relatively open in content, it marks a basic ethical decision for a *concept of justice* that includes all living and future human beings. Compared to earlier concepts of justice, this definition expands the subject matter immensely: It is anthropocentrically conceived, but due to the spatio-temporal dissolution of boundaries, it is a great step forward. For thousands of years, justice was discussed within the boundaries of a political entity, the classical Greek polis. Even John Rawls' theory of justice is explicitly limited to this, although Rawls considers an extension to the global dimension and to non-human living beings possible in principle. At least this global dimension moved into the focus of debates in the 1960s at the latest. The Brundtland Report goes one step further and includes future generations of humanity. However, the biblical model of global justice for all living beings and for all futures, as explicitly laid out in the story of God's covenant with Noah and Creation in Gen. 9, has not yet been achieved. In contrast to biblical biocentrism, the concept of sustainable development remains anthropocentric.

Chart: The growing scope of notions of justice



This is where the first limitation of the concept becomes apparent: while it is a huge advantage for the transformation of the economy to use an anthropocentric concept because it is more easily accepted in economic circles, it also poses the great danger of permanently cementing the exclusion of the needs of non-human living beings.

Another weakness of the Brundtland definition is that, to date, it has not even been rudimentarily clarified what can and cannot be considered relevant human "needs". The definition pretends that this is simple and clear. In reality, a clean criteriology would be needed to distinguish between (elementary and legitimate) needs and (beyond that, at most, optional) desires.

As we have already seen (cf. chapter 6.1), the concept of sustainable development established at the United Nations since the Brundtland Report envisages development with global economic growth. From this we must conclude that in case of conflict, economic and social concerns are given priority over ecological ones. The likelihood that a growth-oriented concept of sustainability will achieve what it sets out to do is reduced (Arne Næss 1997, 66).

Finally, the concept of sustainability still contains a great deal of vagueness today. In 1996, barely ten years after the Brundtland Report, the Chief Economist of the World Bank, Herman E. Daly, considered the concept of sustainability "dangerously vague" (Herman E. Daly 1996, 1). This characteristic of the Brundtland definition had allowed for a broad consensus, which might have been a good political strategy at the moment of initial ignition. Less than a decade later, however, this vagueness of the term was no longer a basis for consensus, but a "hotbed of dissent" (Herman E. Daly 1996, 2). Little has changed in this regard to this day (Ben Purvis et al. 2019, 685). In the following sections, therefore, a little more clarity and conceptual acuity will be established.

6.2.2 The three "pillars" of sustainability

One component of almost all definitions of sustainability is the talk of three "pillars" of sustainability. These are *ecology, the economy and social issues*. Sometimes a fourth or even a fifth pillar is added (Ben Purvis et al. 2019, 685), but none of the proposed additions has really gained acceptance. The three-pillar approach may therefore be regarded as sufficiently recognised. It has its origins in the "World Conservation Strategy", which the United Nations Environment Programme (UNEP) drew up in 1980

together with two international environmental organisations (IUCN and WWF). In it, the general goal is defined that social, economic and ecological factors must be taken into account equally in a future-oriented policy (IUCN/ UNEP/ WWF 1980, 1). This thesis is also reflected twelve years later in Agenda 21 of the UNCED in Rio. On a scientific level, for the first time in 1987, Becky J. Brown and colleagues demanded that the term sustainability must be considered from three perspectives (Becky J. Brown et al. 1987, 716–717). A little later, Edward Barbier turned this into three pillars to represent the interaction of three systems—the biological, the economic and the social (Edward Barbier 1987, 101–110).

In academic discourse, the question of what the three entities actually are (Ben Purvis et al. 2019, 689–690) remains unresolved: are they three interacting systems, each with its own system rationality, three formal academic perspectives, each with its own skills and knowledge, or three main material goals of political action? Each of these three interpretations is represented by numerous authors, and so far it has not been possible to agree on any of them.

In addition, other *pictorial representations*, which of course also want to express other relationships between the three areas, soon start to compete with the column model:

- Three pillars symbolise three systems or methods that stand side by side and are independent of each other.
- Three interlocking circles postulate hierarchisation: the ecological system encompasses the other two; the social system encompasses the economic one.
- Three intersecting circles signal three equal systems or perspectives that have intersections both in pairs and all three together. Sustainability in the comprehensive sense would then be precisely this intersection of all three "sub-forms of sustainability".

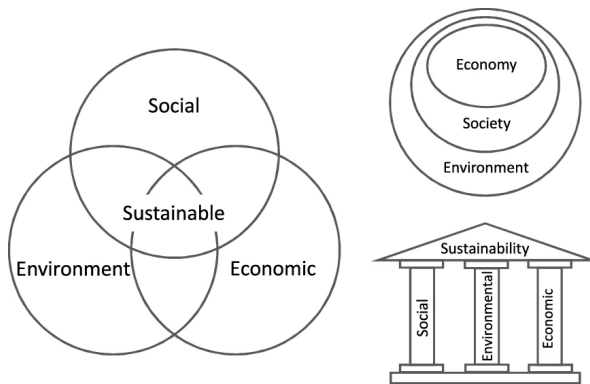


Figure: Common graphical representations of the "three pillars of sustainability" (taken from: Ben Purvis et al. 2019, 682)

To date, there is no generally accepted conceptualisation of the three pillars, which is frustrating for those wishing to operationalise the sustainability concept (Ben Purvis et al. 2019, 681) because "Much of the public discourse around sustainability [...] is organised around this business-based conceptualization of the three-circle rubric without much disciplined thought about how it does and does not translate into a more comprehensive understanding of sustainability" (Paul B. Thompson 2017², unfortunately the book has no page references).

The question of the different weighting of eco-social sustainability on the one hand and economic sustainability on the other remains particularly controversial (Markus J. Milne 1996, 137). All sustainability approaches seem to have in common the effort to reform the traditional economy in theory and practice (Ben Purvis et al. 2019, 691). However, opinions differ widely on how far to go and how deep the need for reform of the economy is. Whether ecological or economic sustainability ultimately takes precedence, or whether the two are formally on an equal footing, is hotly disputed.

In the face of this massive disagreement, the interdisciplinary approach of the World Bank's Chief Ecologist and Chief Economist, Robert Goodland and Herman Daly (1996), seems to me to be the smartest: they use the image of the three overlapping circles and interpret the three circles as *three perspectives on reality*. Each perspective is examined *separately and autonomously* by the scientific disciplines assigned to it. This results in clarifications of what is economically sustainable, what is ecologically sustainable and what is socially sustainable. The three groups of scientific

disciplines must then search for the intersection or overlapping areas in interdisciplinary discourse (Robert Goodland/ Herman Daly 1996, 1002; similarly, Markus Vogt 2009, 142–143). This task remains difficult enough. However, since the three perspectives are considered formally equal and are autonomous in their perspectives, the debate as to whether ecological or economic sustainability takes precedence is superfluous. Each of the three perspectives has a veto right over the other two—thus, the equality of the sciences is taken seriously. None of the three aspects can fall by the wayside. This is indispensable from a biocentrist perspective (Guido Montani 2007, 25–60).

6.2.3 What is replaceable? Strong versus weak sustainability

Since the publications by Robert Goodland and Herman Daly in 1996, the economic question of how far environmental resources can be replaced by anthropogenic goods has served as a litmus test for evaluating concrete sustainability concepts. The terminology used here is that of "capital", which reveals the economic perspective of the question. Of course, this perspective has been linked to modern biology and ecology from the beginning. Darwin's theory of evolution would be just as unthinkable without the adoption of economic paradigms as ecology as a biological sub-discipline. A distinction is made between natural capital (natural resources), physical capital (things produced by humans), social capital (interpersonal relationships and structures) and human capital (knowledge and skills acquired by a person). To what extent can the capitals of different categories be substituted with others so that the needs of future generations can receive equal consideration as the needs of people living now? That is the guiding question.

Usually, the following four levels are distinguished between when answering these questions (cf. Robert Goodland/ Herman Daly 1996; Herman E. Daly 1996)¹⁸:

- *Weak sustainability*: All categories of capital can be replaced by all others. The only important thing is that their sum remains constant. This would mean that nature can be destroyed to any extent at any time, as long as only man-made things, social or human capital of the same

18 Hans Diefenbacher 2001, 69–72 proposes a slightly modified scale in terms of terminology and content, but I will not introduce it here specifically, as it does not yield significantly different results.

value are created. Economically, one has to say that weak sustainability is the minimum to be able to speak of sustainability at all. At the same time, it can be said that most countries in the world are already operating sustainably from a purely economic perspective (Konrad Ott 2016, 83).

- *Medium sustainability*: All categories of capital are only replaceable with all others within certain limits. In this case, one would already have clearly limited the substitutability of natural capital. For example, one could consider the substitutability of oil with human wealth to be responsible as long as a certain amount of oil remains in the ground. However, one would then have to justify why exactly this amount of oil should remain in the ground. One possible argument could be to keep certain options open for future generations as a precautionary measure that we do not even foresee today—this is called a "safe minimum standard" (Konrad Ott 2016, 83). However, this would still leave open the question of how this minimum of security can be defined in more detail. The argument is very vague and subjective—and therefore certainly not the silver bullet of sustainability.
- *Strong sustainability*: Capitals of different categories are not interchangeable unless they fulfil the same systemic functions. This should be extremely rare because the eco-systemic functions of a given natural resource are usually highly complex. Strong sustainability is thus oriented towards the almost complete preservation of natural capital. This model is favoured by Goodland and Daly (as well as Hans Diefenbacher and Konrad Ott). Markus Vogt also affirms it as a goal but suggests defining a transitional period in which medium sustainability is still accepted (Markus Vogt 2009, 137). From a pragmatic point of view, the model will probably not work without such transition periods. However, experience teaches that such periods are often pushed back when they have been achieved or are imminent. Politically, they can at best only be effective if their transgression immediately leads to noticeable sanctions.
- *Absurdly strong sustainability*: In this model, there is no economically acceptable substitution at all, which would hardly be feasible in everyday life and can be justified neither economically nor ethically in this totality.

Why is the substitution question so central? Within economics, it is an important touchstone for what is economically reasonable—irrespective of the environmental debate. In the context of a sustainability discourse that asks in theory of science about the relationship between ecological,

economic and social aspects, it gains additional relevance because it allows indirect indications of the autonomy and independence of the ecological perspective. The concepts of weak and medium sustainability subordinate ecology to economy. Conversely, the concept of absurdly strong sustainability subordinates the economy to ecology. Only the concept of strong sustainability allows the two perspectives to stand side by side on an equal footing and autonomously. It is therefore the only one that agrees with the interpretation of the "three pillars" or overlapping circles proposed here as three autonomous, equal scientific perspectives.

An ethical argument must be added to the scientific argument: Environmental ethics does not think in terms of capitals, but in terms of goods (Konrad Ott 2016, 82). Goods, even if they are only related to humans, also include those that cannot be captured in monetary values and therefore remain economically invisible. These, in turn, include both human "dependencies on nature" and certain eudaimonistic "forms of enjoying nature", i.e. forms that are conducive to human happiness and well-being (Konrad Ott 2016, 82). Ethically, therefore, "it is also a question of whether we *want to* substitute natural goods for artefacts in the sphere of our practical interaction with nature" (Konrad Ott 2016, 85). Would it do us good, for example, if we were to largely replace the sound of the sea or the singing of birds with artificial stimuli? Ott assumes that at least a considerable number of people would answer this question in the negative, and this number would already have to be taken into account in an anthropocentric argument. However, Ott also lets it be known that he is open to a non-anthropocentric argument, which would be even stricter anyway.

6.2.4 The five rules of ecological sustainability

At least in the German-speaking world, *five rules* have been found for the determination of ecological sustainability on the basis of the preceding considerations, which are widely accepted. The first three rules achieved a breakthrough in 1990 through the economists (!) David Pearce and Kerry Turner (1990, 45–46). The fourth rule was drawn up by the Enquête Commission "Protection of People and the Environment" of the German Bundestag in 1994, and the fifth rule was added shortly afterwards by the German government's Expert Council on the Environment. In their subsequently published version, these rules read (cf. Deutscher Bundestag (ed.) 1998, 25.223):

- (1) "The rate of depletion of renewable resources should not exceed their rate of regeneration. This corresponds to the requirement to maintain ecological performance, i.e. (at least) to maintain the ecological real capital defined by the functions.
- (2) Non-renewable resources shall only be used to the extent that a physically and functionally equivalent substitute is created in the form of renewable resources or higher productivity of both renewable and non-renewable resources.
- (3) Substance inputs into the environment should be oriented towards the load-bearing capacity of the environmental media, whereby all functions are to be taken into account, not least also the "silent" and more sensitive regulatory function.
- (4) The timing of anthropogenic inputs or interventions in the environment must be in balance with the timing of natural processes relevant to the environmental response capacity.
- (5) Hazards and unacceptable risks to human health from anthropogenic impacts shall be avoided.

On the content of the rules:

- (1) The first rule describes the so-called "sustainable yield" of renewable resources. It is immediately obvious: Only the interest, not the capital stock, of renewable resources may be used. It is obvious that this rule corresponds to the concept of strong sustainability and does not pose any problem for economists.
- (2) The second rule defines "quasi-sustainability" for non-renewable resources. The extent of their use results from the sum of the additionally developed and functionally equivalent renewable resources and the increases in efficiency in the use of all equivalent resources. The study "Sustainable Germany" drops the second alternative in this rule (BUND/Misereor (eds.) 1996, 30). This refers to the already discussed question of how far fossil resources should be substituted with efficiency increases. Are we allowed to consume more fossil resources today if we leave more efficient technology to our descendants in return? In any case, the danger of excessive application of this rule must be kept in mind, otherwise it moves from strong to medium sustainability—which would not be the option advocated here.
- (3) The third rule of so-called "critical loads" mitigates the danger that the second is interpreted too generously. This is because the most important area of non-renewable resources is fossil fuels, whose use is always associated with greenhouse gas emissions. The upper limit of their use therefore results less from the question of how much oil or

natural gas we must leave to future generations than from the question of how much greenhouse gases the earth can offset in a given period of time. In fact, then, this will be the central sustainability rule. It defines what is called "sustainable waste disposal".

- (4) Finally, the fourth rule, added by the Enquête Commission, takes into account that natural cycles react with a certain delay. This slowness of nature must be taken into account when setting limit values. In this respect, rule four tightens rule three.
- (5) The fifth rule emerged from the debate on the sustainability of nuclear energy. Quite a few countries see this technology as the key to sustainable development because it significantly reduces resource consumption and greenhouse gas emissions without having to lower human living standards. It thus promises sustainability as a free gift. But its long-term risks, not only for human health, are considerable. Here, the German Advisory Council on the Environment, which added this rule, unequivocally indicates that it does not accept such a solution.

The rules are—although found in the context of the anthropocentrically conceived sustainability discourse—biocentric, for in Rule (1) as well as in Rule (3) and Rule (4), the perspective is set on ecological functions, and explicitly on all ecological functions. In fact, these will include functions that have an impact on humans, at most via long detours, but are of direct existential importance for other living beings. It seems easier to think anthropocentrically from philosophical theory than from concrete ecological practice. Surprising as it may be, the question is serious: can there ever be strong ecological sustainability that remains within the narrow horizon of anthropocentrism in which it originally arose?

As far as the academic reception of the rules is concerned, the first three by David Pearce and Kerry Turner are practically standard in the sustainability debate worldwide. The other two, on the other hand, have unfortunately not yet found their way out of the German-speaking world into the international arena. For all five rules, however, it is often the case that they are referred to but not presented in detail or discussed in depth. The handbook by Georg Müller-Christ "Nachhaltiges Management" (Georg Müller-Christ 2020³, 266) is paradigmatic. Now in its third edition, it is a standard work for studies and practice in business administration. If the sustainability rules are only presented there, but not discussed controversially, this can only mean that they are not yet hurting companies—although hardly any company is likely to comply with all the rules. Chapter 8 will therefore ask how the state can promote this pain when rules are violated.

6.2.5 The concept of sustainability and holistically based biocentrism

The preceding analysis shows that a concept of sustainability that thinks broadly enough inevitably goes beyond the narrow limits of its anthropocentric location and must integrate biocentric criteria. Because of the interconnectedness of natural processes, sustainability cannot be defined as benefiting only humans. It must take all living beings into account and preserve the functional integrity of species, ecosystems and biomes. Arne Næss' (1990, 96) claim that biocentrism and sustainable development are mutually exclusive concepts must therefore be differentiated between: On the level of theory this assertion is correct, but on the level of practice it is not. For while the practice level determines concrete action, the theory level influences the motivation of those acting. The normative concept of strong sustainability may therefore be sufficient to justify the desired environmental behaviour. However, it remains deficient if people need to be motivated to act in this way.

A second argument in favour of the biocentric containment of the concept of sustainable development refers to the narrower limits of ecological sustainability, which leave less room for weak interpretations. If sustainability is conceived anthropocentrically, the ecological limits of the five rules of sustainability can be interpreted more elastically. Then the economic and social "pillars" gain the upper hand over the ecological one (Guido Montani 2007, 25–60). In addition, it is easier to create too much trust in human technology and established institutions. The dynamics of anthropocentrically interpreted sustainability concepts tend more towards technical efficiency than towards nature-oriented sufficiency (Martha J. Groom et al. (eds.) 2006³, 593). This ultimately favours an attitude of "techno-arrogance" (Gary K. Meffe 1992, 350–354). If, on the other hand, sustainability is defined biocentrically, an action is only sustainable if it does not threaten to extinguish other, non-human life. The biocentrist framework thus steers the idea of sustainability more clearly and unambiguously in the direction of strong sustainability (Guido Montani 2007, 25–60).

Finally, a biocentrically contained conception of sustainability is more resistant to a relapse or persistence in the classical exclusive or dominant orientation towards economic growth. Sustainable development is not the same as sustainable growth. The latter—at least in purely quantitative terms and understood at the global level—is not compatible with ecological sustainability (Martha J. Groom et al. (eds.) 2006³, 592). In a modern, diverse society, however, its limits must be sought and enforced through

complex regulatory mechanisms. This requires both structural reforms and cultural paradigm shifts (Guido Montani 2007, 25–60). The latter can be provided much better by holistically based biocentrism than by classical anthropocentrism.

The successes from three decades of political and social sustainability debates and concepts clearly lie more in the social than in the ecological sphere (Martha J. Groom et al. (eds.) 2006³, 622–623). If a theory may be judged by its fruits, then it is indeed urgently time to explode the anthropocentric concept of sustainability and embed it in holistically based biocentrism. What this means in concrete terms for the two greatest challenges, climate protection and the preservation of biodiversity, will be examined in the following.

6.3 *Sustainable climate protection*

In the description of the greatest ecological challenges of the present in chapter 2.4, we already identified the phenomenon of anthropogenic global warming as one of the two main problems in dealing with planetary boundaries and took a detailed look at its causes. Compared to pre-industrial levels, we have currently already reached global warming of 1 degree Celsius (IPCC 2018, 4). We will reach the 1.5 degrees targeted as a maximum under "business as usual" between 2030 and 2052 (IPCC 2018, 4). And by 2100, even the commitments made so far by the parties to the Paris Climate Agreement would cause global warming of well over 2 degrees Celsius (IPCC 2018, vi)—an estimated 3 to 4 degrees.

Such warming is unacceptable. The main reason for it is the so-called tipping points (IPCC 2018, 262–264). These are threshold values at which an ecosystem that is important for the Earth's climate suddenly changes in such a way that we can no longer calculate the resulting impacts. If these limits are exceeded, processes are triggered that humans can no longer control or reverse: These are "points of no return"! Climate research names the following in particular as such tipping points: complete loss of year-round Arctic ice, forestation of the tundra, thawing of the permafrost, increase in the intensity of the Asian monsoon, massive reduction of rain in the deforested rainforest areas and thus further loss of rainforest dying due to drought, and increased death of the boreal forests. Most of these tipping points can be fairly safely avoided below 1.5 degrees of warming and remain reasonably unlikely even below 2 degrees but are highly likely to occur between 3 and 4 degrees. This is precisely why the 1.5 degree

target is not an arbitrary mark but owes its existence to clearly identifiable risk trade-offs.

In addition to the larger safety margin from tipping points, achieving the 1.5 degree target offers a number of other milder consequences compared to the 2 degree target (IPCC 2018, 7–8):

- The rise in sea level will only be about 50 instead of about 60 centimetres—quite a relevant difference in the case of storms and storm surges.
- Species loss will be significantly lower, e.g. only 6 instead of 18 per cent of all insect species and 8 instead of 16 per cent of plant species will die.
- The thawed permafrost soils will cover 2 million square kilometres fewer.
- The Arctic will be ice-free only once per century instead of once per decade.
- Coral reefs will only die at a rate of 70 to 90 per cent instead of 100 per cent.

What is the target for anthropogenic greenhouse gas emissions? Global CO₂ neutrality ("*net zero*") should be achieved by 2050 at the latest, with a reduction of 45 per cent in 2030 compared to 2010 (IPCC 2018, 12). In the year the 2018 report was published, this corresponded to a residual budget of 580 gigatonnes of carbon dioxide equivalents. The chance that global warming will not exceed 1.5 degrees is then 50 per cent. If the residual budget is cut to 420 gigatonnes of carbon dioxide equivalents and "*net zero*" is already achieved in 2040, the chances of a maximum of 1.5 degrees of global warming increase to 66 per cent (IPCC 2018, 33). For orientation: in 2019, global greenhouse gas emissions were 37 gigatonnes of carbon dioxide equivalents. So, we only have a residual budget of about ten to fifteen instances of such annual consumption for the next 30 years. The challenge is enormous.

Now, we identified the concept of sustainability as an internationally and intergenerationally expanded concept of justice. Current consumption levels are very unevenly distributed globally. In the Middle East, each person emits over 20 tonnes of carbon dioxide equivalents per year, in Canada and the USA around 15, in Europe 6 to 9, in China 7, but in India only 2 and in Africa only 1 tonne. While there have been slight declines in Europe, emissions in most other countries in the world continue to rise—currently at a global rate of 1.1 per cent per year. So not only are we miles away from "*net zero*", but we are even following a path in the opposite direction. Indeed, the target should be roughly the current level of India: 1.5 tonnes of carbon dioxide equivalent per person per year. The ethical principle of "*equity*" requires roughly equal per capita consumption for

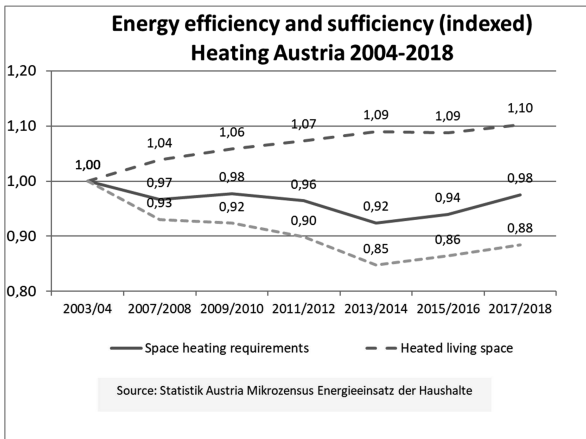
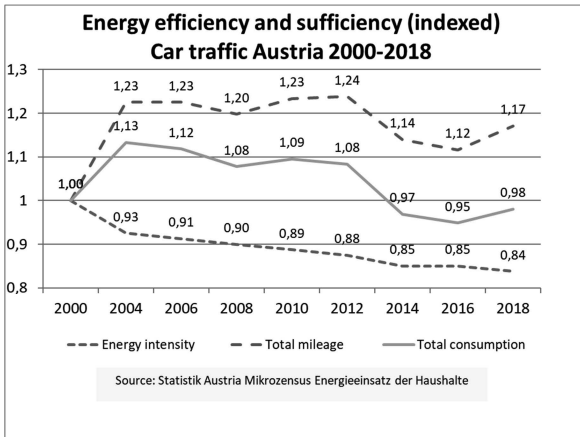
each person. Africa and the poorest countries in Asia are therefore still allowed to increase their levels, while practically the entire rest of the world must drastically reduce its levels.

The development path proposed by the IPCC is accordingly ambitious: It "requires rapid and far-reaching transitions in energy, land use, urban development and infrastructure (including transport and buildings) and industry" (IPCC 2018, 15).

- Electricity must come from 70 to 85 per cent renewable sources by 2050, 8 per cent from natural gas power plants with carbon capture storage (the capture of carbon dioxide that is either injected into cavities deep in the earth or otherwise processed) and almost 0 per cent from coal (IPCC 2018, 15–16). A significant reduction in energy consumption in all sectors is essential.
- Industrial emissions must be reduced by 65 to 90 per cent.
- Buildings must cover 55 to 75 per cent of their energy needs electrically.
- The share of "low-emission transport" must be increased from 5 to 35 to 65 per cent.
- Large areas of current pastureland need to be converted into fields for energy crop cultivation and, above all, into forests.

It is easy to imagine that such fundamental changes will not leave their mark on people's lifestyles. In fact, it is easy to see why the industrialised countries have been treading water on climate protection for 30 years: All the savings made through technical efficiency improvements are eaten up by the ever-increasing demands of people. This is shown in the following two graphs using two examples:

- The efficiency of Austrian passenger cars improved noticeably from 2000 to 2018. Although the average car has become bigger and heavier, it needs 16 percentage points less energy for 1 kilometre of driving. At the same time, however, Austrians drove 17 per cent more kilometres in 2018—which de facto amounts to consuming practically the same amount of energy as in 2000.
- The situation is very similar in terms of heating living spaces. Energy intensity per floor area was reduced by 12 percentage points from 2004 to 2018 through building insulation and better heating systems. At the same time, the living space per person increased by 10 per cent—which also amounts to a zero-sum game.



Figures: Increases in technical efficiency and human demands and the resulting energy consumption in the car and residential heating sectors. Graphics by the author, figures from: http://www.statistik.at/web_de/statistiken/energie_umwelt_innovation_mobilitaet/energie_und_umwelt/energie/energieeinsatz_der_haushalte/index.html and http://www.statistik.at/web_de/statistiken/menschen_und_gesellschaft/wohnen/wohnsituation/081235.html (retrieved: 1.2.21).

In other words, this is not due to a lack of technical efficiency. Industry and technology have done their homework to a considerable extent. It is rather due to the lack of sufficiency of people. No sooner has a gain in efficiency occurred than people claim it for themselves instead of passing it on to the environment. This so-called "rebound effect" has been predicted

since 1865 and is also called Jevons' Paradox after its discoverer¹⁹. Sustainable climate protection is therefore primarily a *sufficiency problem* and not an efficiency problem. The "Gospel of Eco-Efficiency", as it was called in Samuel P. Hays 1959 and later popularised by Joan Martinez-Alier (2002, 1) does not work. On the contrary: from an economic point of view, efficiency is even a driver of growth (Helmut Haberl et al. 2011, 9).

The question is: Who dares to say so? Demanding sufficiency is uncomfortable—some political parties have already lost elections this way. It is therefore not surprising that the *IPCC* is rather cautious in this respect. It says: "Demand-side measures are key elements of 1.5°C pathways. Lifestyle choices lowering energy demand and the land- and greenhouse-gas intensity of food consumption can further support achievement of 1.5°C pathways." (IPCC 2018, 34 and 97). Demand-side measures are referred to as a "key element"—presumably meaning demand from industry to produce lower-resource products. Personal lifestyle changes, especially in the areas of energy and nutrition, can "additionally support" the achievement of the 1.5 degree target, it is then said. One senses how shy and coy the world's 3,000 most renowned climate researchers are about addressing the issue of lifestyle. It seems almost grotesque that they then even claim that such lifestyle changes are already taking place "around the world" and have led to significant reductions (IPCC 2018, 42.317). In this case, only the wish can have been the father of the thought, trying to write a global success story out of local showcase projects.

In total, only 8 pages are devoted to the topic of lifestyle and behavioural change in the 630-page report (IPCC 2018, 362–369, chapter 4.4.3). In the introduction, the report makes one clear statement: "Humans are at the centre of global climate change: their actions cause anthropogenic climate change, and social change is key to effectively responding to climate change [...] Consistent pathways assume substantial changes in behaviour." (IPCC 2018, 362). A little later, however, we learn that people like efficiency measures more than sufficiency measures because they "cost" them less effort (IPCC 2018, 364). And the advice that follows reveals the IPCC's concentrated courage- and helplessness: The capacity of poorer people to take action should be strengthened, and knowledge and motivation should be promoted. Where action is taken together, everyone is more motivated (IPCC 2018, 365). Negative feelings about global warm-

19 William Stanley Jevons 1865, 103: "It is wholly a confusion of ideas to suppose that the economic use of fuel is equivalent to a diminished consumption. The very contrary is the truth."

ing could help—the greater the concern, the more people would do (IPCC 2018, 365). Policymakers prefer technical solutions, but "they fall short of their true potential if their social and psychological implications are overlooked" (IPCC 2018, 366). Price incentives are therefore important—extrinsic motivation should accompany intrinsic motivation (IPCC 2018, 367).

This intrinsic motivation for sufficiency is invoked once in a powerful appeal for values research: "The profound transformations that would be needed to integrate sustainable development and 1.5°C-compatible pathways call for examining the values, ethics, attitudes and behaviours that underpin societies. Infusing values that promote sustainable development, overcome individual economic interests and go beyond economic growth, encourage desirable and transformative visions, and care for the less fortunate is part and parcel of climate-resilient and sustainable development pathways. This entails helping societies and individuals to strive for sufficiency in resource consumption within planetary boundaries alongside sustainable and equitable well-being." (IPCC 2018, 475)

The fact that religions do not appear in the IPCC report probably has more strategic than substantive reasons. One wants to avoid additional fronts. Nevertheless, Pope Francis' *encyclical Laudato si'* is infinitely more courageous and clear when it comes to personal lifestyles—and at the same time highly integrative with regard to environmentally-minded people of all religions and world views. Personal lifestyle and consumer habits are at the heart of the encyclical. They are embedded in a holistic understanding of social progress, as Paul VI had already advocated in *Populorum progressio* 1967 (LS 46). The common narrative of progress in modernity, on the other hand, is exposed as a "myth" (LS 60; 78; 210). "The call to seek other ways of understanding the economy and progress" is one of the lines of argumentation running through the encyclical (LS 16; cf. 112–113; 191; 194).

Francis begins with the impossibility of maintaining the material consumption of the industrialised countries in a sustainable world: "We all know that it is not possible to sustain the present level of consumption in developed countries and wealthier sectors of society... The exploitation of the planet has already exceeded acceptable limits" (LS 27). Several times he addresses the overstepping of planetary limits: "The pace of consumption, waste and environmental change has so stretched the planet's capacity that our contemporary lifestyle, unsustainable as it is, can only precipitate catastrophes." (LS 161)

From this insight Francis concludes that a fundamental change in consumption patterns is indispensable: "Every effort to protect and improve our world entails profound changes in 'lifestyles, models of production and consumption, and the established structures of power which today govern societies'(CA 58)." (LS 5) And again, "Humanity is called to recognize the need for changes of lifestyle, production and consumption, in order to combat this warming or at least the human causes which produce or aggravate it." (LS 23)

But Francis also knows about the inner resistance to abandoning habits acquired over long periods of time: People would rather deny or play down global warming than make it the yardstick for their own actions. "Such evasiveness serves as a licence to carrying on with our present lifestyles and models of production and consumption. This is the way human beings contrive to feed their self-destructive vices." (LS 59). There is a compulsion to consume rather than freedom to consume (LS 203), because: "The emptier a person's heart is, the more he or she needs things to buy, own and consume. It becomes almost impossible to accept the limits imposed by reality. In this horizon, a genuine sense of the common good also disappears." (LS 204)

Finally, Francis focuses on global inequalities and recalls the equity principle of equal emission and consumption rights for all people. Climate justice or, even more broadly, Creation justice is essential for him: "We know how unsustainable is [*sic*] the behaviour of those who constantly consume and destroy, while others are not yet able to live in a way worthy of their human dignity. That is why the time has come to accept decreased growth in some parts of the world, in order to provide resources for other places to experience healthy growth." (LS 193). The following chapters 7 to 9 will deepen how the path to lower consumption can be followed.

6.4 Sustainable biodiversity conservation

While the climate problem can be solved anthropocentrically, at least at the level of justification, and needs holistically based biocentrism mainly for the sake of motivation, it is clearly different with the second key problem of sustainability, the preservation of biodiversity. Here, as we will see, anthropocentrism already reaches its limits at the level of justification. For in individual cases, it will not always be possible to prove that a particular species or ecosystem really serves the survival or enjoyment of humanity.

This is one reason why preserving biodiversity is even more difficult than climate protection.

As already mentioned, the UNCED Biodiversity Convention of Rio 1992 defines it as follows: "Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems". (United Nations 1992, Art. 2; cf. chapter 2.5). Accordingly, biodiversity is understood as the diversity of life forms in all their forms (genes, species, ecosystems and additionally landscapes) and their relationships to each other.

Biodiversity is currently under massive threat. As we saw in chapter 2.5, of all the nine planetary boundaries, this one has been exceeded the most—far more than that of global warming. In view of the sixth human-induced mass extinction in the history of the earth, the first question that arises is therefore the value and significance of biological diversity (cf. on the following: Michael Rosenberger 2018a): Is it worth preserving, and if so: why? In answering this question, it is important to avoid succumbing to the so-called naturalistic fallacy. Biological diversity is not valuable simply because it was produced in natural processes. No direct conclusion can be drawn from what is to what ought to be.

The answer to the question of the value of diversity can first of all be given with regard to its functions, i.e. on the basis of utility considerations. This corresponds to the so-called "*ecosystem approach*", which Pope Francis also largely follows in *Laudato si'*. Usually, four categories of ecosystem services are mentioned (TEEB 2010, 45–46):

- Utilities such as the supply of food, raw materials, fresh water and remedies.
- Regulatory services such as regulation of local climate and air quality, carbon capture and storage, mitigation of extreme events such as floods, storms and landslides, waste water treatment (mainly by microorganisms), erosion prevention and soil fertility conservation, pollination of plants and biological pest control.
- Supporting services such as the provision of habitats for animal and plant species or the conservation of genetic diversity.
- Cultural benefits of an aesthetic, mental, spiritual or other nature, such as recreation, health, stimulation for artistic and cultural creation, spirituality, identity and sense of belonging.

Ecosystems can only provide these services comprehensively if they themselves are present in great diversity (the third level of biodiversity). How-

ever, their diversity and stability depend on the diversity of species and gene combinations (the first two levels of biodiversity). The earth as the comprehensive house of life thus needs biodiversity at all three (or, if landscapes are included, four) levels in order to be able to provide its services optimally. Therefore, from an anthropocentric perspective, there are already good reasons for preserving biodiversity. These can be structured according to the three "pillars" of sustainability:

Ecological reasons: From the perspective of modern ecology, the diversity of species and genes is an indispensable condition for higher organisms to have been able to develop and survive in the course of evolution. More complex organisms need relatively constant environmental conditions, and these only prevail in diverse communities. Diversity is a guarantee for the survival of higher organisms, including humans. A continuation of the current rate of species extinction would not only result in the domino-like collapse of many ecosystems in the medium term but would certainly also cost the lives of many people, possibly even leading to the extinction of humankind. "We are all dependent on one another." (LS 42, cf. also LS 34)

Economic reasons: Almost all the ecosystem services mentioned can in principle be quantified in monetary terms. They have an economic dimension. This is not exhaustive—there are aspects of biodiversity that by definition exceed any economic calculation. Nevertheless, this does not exclude economic considerations. On the contrary: in view of the fact that the economy is the dominant subsystem of society in postmodernity, the significance of biodiversity must also, and even above all, be quantified in economic terms (cf. chapter 8).

The importance of biodiversity for agriculture (LS 34) and food security has a particularly direct impact in this respect (Rüdiger Wittig/ Manfred Niekisch 2014, 252). For thousands of years, primitive peoples have used high percentages of the organisms living on their territory to safeguard their livelihoods. This is certainly the most important provisioning service of biodiversity in economic terms. However, the regulatory services listed above also have high economic significance (Rüdiger Wittig/ Manfred Niekisch 2014, 252). Finally, the monetary value of cultural services should not be underestimated.

Pope Francis draws particular attention to future economic fields by highlighting the potential of biodiversity for medicine and pharmacy. The future of biotechnology lies in the exploitation of genetic and species diversity, linked to the use of the knowledge of the effects of individual plants or animals that has been handed down over centuries or even millennia. Thus, the diverse animal and plant species "may constitute

extremely important resources in the future, not only for food but also for curing disease and other uses." Similarly, the diverse genes are "resources in years ahead for meeting human needs and regulating environmental problems" (LS 32).

From an economic point of view, a value analysis of biodiversity is an indispensable precondition for rational decision-making. This is exactly what the project "The Economics of Ecosystems and Biodiversity" (TEEB) is about. "The TEEB study was initiated in Potsdam in 2007 by the environment ministers of the G8+5 countries and looks at the global economic benefits of biodiversity and the costs of biodiversity loss due to failure to take conservation action compared to the costs of effective conservation." (TEEB 2010,3) This is because "from an economic point of view, the flows of ecosystem services can be seen as 'dividends' accruing to society from natural capital. Maintaining the natural capital stock enables these flows to be provided in the future on a sustainable basis, and thus contributes to continued human well-being." (TEEB 2010,9)

Social and cultural reasons: Just as (almost) all services of diverse ecosystems can be viewed ecologically and economically, they can also all be viewed under socio-cultural aspects (LS 190): In service to man, insofar as he is precisely not only homo oeconomicus and not only part of the earth's ecosystem, but at the same time also a socially living, creative, discovering, inventive and profound human being. He not only wants to survive but takes pleasure in the beauty of nature and sees in its diversity and richness of variety an aspect that constitutes this beauty. Humans can see and get to know the diversity of life; they can experience it and perceive its message (LS 33). Biodiversity has a significant recreational value, an educational value as well as an artistic and spiritual value, indeed an identity-forming value.

Of course, the cultural and aesthetic value of biodiversity is very subjective and bound to the respective culture (Rüdiger Wittig/ Manfred Niekisch 2014, 249–253). Moreover, nature often serves as a mere backdrop and is even damaged for the sake of other "cultural values" (motocross, mountain biking, etc.). After all, it is not the biodiversity of an ecosystem as such that provides a sense of home and identity, but its character, its uniqueness and distinctiveness.

As irreplaceable as reasons are in controversial environmental debates: they do not touch the heart. Only very intimate spirituality can do that. Its Christian form recognises in the diversity of Creation an image of the manifold, infinite Creator God. The doctrine of the Trinity of God says at its core that God is life overflowing out of and into himself, love

transcending itself and yet always remaining with itself or returning to itself. This incomprehensible fullness of divine life and love is reflected in the exuberant creativity of the creatures. In them, it becomes comprehensible and tangible to man (LS 86): "Mountains have heights and they are plentiful, vast, beautiful, graceful, bright and fragrant. These mountains are what my Beloved is to me. Lonely valleys are quiet, pleasant, cool, shady and flowing with fresh water; in the variety of their groves and in the sweet song of the birds, they afford abundant recreation and delight to the senses, and in their solitude and silence, they refresh us and give rest. These valleys are what my Beloved is to me.." (LS 234; quoting John of the Cross, *Cántico espiritual* B XIV, 6–7).

Diversity transcends any measurable value because God himself is diversity. His love cannot be quantified in values, because love is precisely that which cannot be grasped, measured or calculated. Nevertheless, this spiritual depth view of love does not replace rational argumentation with measurable values but complements and deepens it: even if there were living beings that had no use whatsoever, we should not simply destroy them.

If it can be assumed that the preservation of biodiversity is ethically imperative, then the question arises as to the way forward. The threat to diversity is a problem for society as a whole and an international problem that can only be solved in a joint effort by everyone. That is why the heads of government present at the UNCED in Rio in 1992 signed a convention on biodiversity that is binding under international law, which deals not only with the protection of biodiversity and ecosystems, but also with the equitable distribution of their economic costs and yields. The sustainable use of ecosystems, access to genetic resources and financial and technological cooperation are to be subjected to regulation that strives for an economic balance between poor and rich countries as well as between landowners and the general public.

In general, two strategies emerged in Rio, each with its own meaning. They can be summed up in striking formulas:

- Protection *from* use and
- Protection *by* use.

The current debate, dominated mainly by US scientists, is very much focused on the first strategy of *protection from use*, in the form of the establishment and expansion of *protected areas*²⁰. "Protected areas are the

20 Strictly speaking, the principle of "protection from use" includes not only territorial protection, but also the protection of certain species regardless of location.

cornerstone of biodiversity conservation [...] Where networks of protected areas are large, connected, well managed, and distributed across diverse habitats, they sustain populations of threatened and functionally important species and ecosystems more effectively than other land uses." (Eric Dinerstein et al. 2017, 534) This quotation already indicates the essential criteria for a policy of protected areas: They should cover large areas so that the animal and plant populations living in them have sufficient habitats and can display a high level of genetic diversity. They must be connected via so-called "migration corridors" so that populations from different protected areas can mix and thus ensure genetic stability. They need good management so that possible undesirable developments can be recognised and corrected at an early stage. And they should have a large variety of habitats for different animal and plant species, so that some protected areas are suitable as habitats for each species.

The prize question in this first strategy of protected areas is, of course, how many large protected areas are needed globally. The Brundtland Report of 1987 gave an initial answer to this question, stating that "the total expansion of protected areas needs to be at least tripled if it is to constitute a representative sample of Earth's ecosystems" (United Nations 1987, Ch. 6, No. 72) The number of protected areas worldwide should be tripled, from about 3 to 4 per cent at that time to 10 to 12 per cent. From a political point of view, tripling is an ambitious goal, and scientifically, there were no serious estimates at that time. Moreover, the Brundtland Report assumed that non-protected agricultural and forest land would continue to be used at the usual moderate intensity. However, this intensity has increased considerably in recent decades, and, in addition, enormous areas of rainforest have been cleared. In this respect, it is clear that 10 per cent in terms of protected areas cannot be enough.

At the sixth Conference of the Parties to the Convention on Biological Diversity (COP-6) in The Hague in 2002, however, something very strange happened: the parties to the Convention no longer agreed on a share of protected areas as a target, but only declared their intention to achieve a "significant reduction" in the loss of biodiversity by 2010. In other words: the disastrous development was to be slowed down but not stopped. And with "significant" a very non-committal term was chosen. It was not until 2010, at the now tenth Conference of the Parties (COP-10) in Nagoya

Rare plants may not be picked or dug up, rare animals may not be killed—not even where they come into conflict with human interests, like the wolf. I will skip this important block of biodiversity protection for reasons of space.

in the Japanese province of Aichi, that this mistake was recognised and rectified. The "Aichi Target 11" states that at least 17 per cent of land and freshwater areas and at least 10 per cent of coastal and marine areas should be protected by 2020. And—this is hard to believe—the target seems achievable. In 2016, according to the UN Environment Programme World Conservation Monitoring Centre and the International Union for Conservation of Nature, 14.7 per cent of the world's land and freshwater areas were already protected (UNEP-WCMC/ IUCN 2016, 30). The figures for 2020 were still pending at the time of this book's manuscript submission.

However, a scientifically based goal is still missing. The CBD treaty process does not ask what is scientifically necessary, but only what is politically possible (Harvey Locke 2013, 15). In contrast, Reed Noss and Allen Cooperrider formulated four goals as early as 1994 against which the protection of areas is to be measured (Reed F. Noss/ Allen Cooperrider 1994; quoted from Eric Dinerstein et al. 2017, 535):

- (1) "represent all native ecosystem types and successional stages across their natural range of variation,
- (2) maintain viable populations of all native species in natural patterns of abundance and distribution,
- (3) maintain ecological and evolutionary processes,
- (4) address environmental change to maintain the evolutionary potential of lineages."

These four criteria have been unanimously accepted in the scientific community. In recent years, many have added another point, which is the new number 4 and moves the former number 4 to the fifth position: (4) "maximise carbon sequestration by natural ecosystems". With this attention to the sequestration of carbon through ecosystems, a bridge is built to climate protection, which in view of the also faltering climate protection programmes makes sense and is factually completely true anyway.

Depending on the region, Noss and Cooperrider (1994, 157–173) give a necessary area share of protected areas of 25 to 75 per cent of the total area. This leads to the somewhat simplistic, yet at the same time more striking formulation that has become the slogan of a broad movement and the name of an organisation since the year 2000: *Nature Needs Half* (<https://natureneedshalf.org/>). The idea is that by 2030, half of the planet's land area should be protected (cf. e.g. Edward O. Wilson 2003 and Robert L. Pressey et al. 2003). This demand has meanwhile been calculated in complicated procedures (e.g. Eric Dinerstein et al. 2017).

Before rushing to judgement on the Nature Needs Half claim, it is important to clarify what "protected" means in this context. The IUCN's World Commission on Protected Areas defined the protected status of natural areas at its Almeria Summit in 2007 as "a specifically delineated area designated and managed to achieve the conservation of nature and the maintenance of associated ecosystem services and cultural values through legal or other effective means." (Nigel Dudley/ Sue Stolton (eds.) 2008, 189) It is therefore about the conservation of both ecosystem services and cultural values. This is a relatively open, broad definition of nature conservation. It also includes, for example, nature parks, which according to the regulations are established primarily for human recreation.

Since 1933, the International Union for Conservation of Nature (IUCN) has been categorising protected areas, which it is constantly developing and standardising in order to establish comparability in view of the completely different legislation of individual countries. At present, this categorisation looks as follows:

- Category Ia Strict Nature Reserve or Ib Wilderness Area: A protected area managed primarily for the purposes of research or for the protection of large, unimpacted wilderness areas. Strict Protection.
- Category II National Park: A large, protected area, at least in its core zone, that has not been altered by human intervention and is used primarily for ecosystem protection and recreational purposes. Strict protection.
- Category III Natural Monument or Feature: A single, naturally occurring landscape feature that is protected. Strict protection.
- Category IV Habitat/Species Management Area: An area designated for the protection of rare species and their habitats, and for which management interventions are targeted. High level of protection through management, which may or may not mean use.
- Category V Protected Landscape/Seascape: An area whose general appearance is preserved for tourism and recreation. Low protection by use.
- Category VI Protected area with sustainable use of natural resources (resource conservation area or cultural landscape with management, biosphere reserve): An area managed for the sustainable use of natural ecosystems and habitats. This explicitly refers to cultural landscapes shaped by humans. Medium protection through use.

While the first three categories entail an almost complete ban on human intervention and thus offer very strict protection, the last three categories by definition contain human design measures. In Category IV, these are

predominantly or entirely geared to the species and habitats to be protected, for example when it comes to so-called "cultural followers", i.e. species that find themselves where a certain form of human culture is cultivated. Categories V and VI, on the other hand, are predominantly concerned with human interests: A picturesque landscape (V) serves recreation and tourism, sustainable landscape use (VI) a regional, environmentally friendly economy.

Now, in most countries, about half of all protected areas are in categories V and VI. The fact that Nature Needs Half counts them has doubled the rate. For Austria, for example, the organisation counts 28 per cent of protected areas in all six categories instead of 17 per cent in the first four categories. For Germany, it is even 38 instead of 16 per cent. The demand for the protection of half of the global land area thus loses a lot of its terror.

However, this broad interpretation creates a problem with regard to the second strategy, *protection by use*. Categories V and VI follow exactly this strategy but are lumped together with the first four and are nominally no longer distinguishable from them. Moreover, the (completely erroneous) impression could arise that the remaining second half of the global land area can be ruthlessly exploited and cultivated ever more intensively. This is precisely the view of some multinational agricultural corporations, who see this as confirmation of their line of the last few decades towards ever higher-bred high-yield varieties and ever more "effective" sprays and fertilisers. The more intensively agriculture works on its land, they argue, the less land it needs and the more it can return the surplus to nature.

In this respect, one should say for the sake of clarity: *Nature needs all!* The ecological standard of near-natural, environmentally friendly agriculture and forestry must be raised step by step and prescribed by law worldwide. A biodiversity strategy worthy of the name cannot possibly be satisfied with improvements on half the land. In principle, this is also the conviction of the process of the parties to the CBD. Surprisingly, however, this idea is hardly reflected in the current international scientific discussion on biodiversity. This must change urgently, as sustainable biodiversity conservation can only be successfully achieved by combining the two components of unused protected areas and farmland that promotes biodiversity.

Because the four-point plan for the implementation of sustainable forestry in Chapter 11 of Agenda 21 was not legally binding and thus insufficient from the point of view of the environmental movement, it turned the Forest Stewardship Council (FSC), which had already existed in

California since 1990, into an international organisation under the leadership of WWF, Greenpeace, trade unions and representatives of indigenous peoples in 1993. Since then, it has certified wood from sustainable forestry so that a higher price can be obtained for it on the market. At the same time, high ecological and social standards were set for certification. The rainforest zone in particular should thus be given the opportunity to forego the clearing of its forests and yet develop a stable source of income. It is a fact that many certifications by the FSC are open to criticism and led to Greenpeace's withdrawal in 2018. But the FSC's approach of protecting forests through ecologically compatible use is not fundamentally questioned by anyone. To establish it better in political agendas as well is one of the major challenges. Greening forestry and agricultural policy is one of the royal roads to true sustainability.

If agriculture and forestry are to be much more ecologised, the question of who pays for it cannot be left out (see chapter 8 for more details). After all, as commercial enterprises, companies in these sectors are dependent on adequate revenues. Some of the higher costs will be recouped through higher prices as soon as imports from countries with lower environmental standards are subject to punitive tariffs (which is possible under current WTO rules). But part of it cannot be regulated by the market economy because the regional differences are too high. Milk from alpine pasture farming will always be more expensive than milk from pasture farming in the lowlands if environmental standards are the same. Here and only here are state subsidies appropriate and necessary. The ecosystem services of ecological alpine farming must be remunerated by the general public.

Climate protection and biodiversity conservation often go hand in hand and support each other. Global warming is one of the main causes of the sixth mass extinction, which requires many animal and plant species to migrate, which they cannot manage at the necessary speed. Climate protection therefore helps to stabilise ecosystems. Conversely, healthy ecosystems are one of the largest carbon stores on earth—forest ecosystems as well as grassland ecosystems. Many semi-natural ecosystems can also absorb water and heat very efficiently and thus cool microclimates. Nevertheless, climate protection and biodiversity conservation can sometimes come into conflict. This is particularly important to consider for certain forms of renewable energy production: Hydropower can destroy the ecosystems of a flowing watercourse. Wind power can disrupt bird migration routes. Biomass production can promote monocultures and intensive agriculture. In such cases, a careful assessment must balance the opportunities and risks involved in achieving both objectives and decide on this basis. Often,

solutions can be found that meet both concerns. Where this is not the case, biodiversity should—*ceteris paribus*—be given priority over climate, for, according to the unanimous assessment of experts, its planetary boundary has already been exceeded much further than that of the climate.

We need to realise that biodiversity loss is an even greater challenge to sustainable development than global warming. The tipping points in ecosystems are much more difficult to calculate than in climate systems. The damage done to date by irreversibly lost species and ecosystems is much higher than the damage to the greenhouse of the earth. The motivation to really achieve something is much harder. And for some of the measures to protect biodiversity, an anthropocentric approach fails because of our lack of knowledge. Holistically based biocentrism, on the other hand, which reverses the obligation to justify, has an easier time in this respect and at the same time provides more emotional potential. It is more "spiritual" than the sober, cool anthropocentrism. As important as it is to also (!) use anthropocentric arguments in dialogue with the economy and society, it would be fatal to stop there.

6.5 *Sustainability and population policy*

In the Anglo-Saxon world, the NGO "Population matters" (<https://populationmatters.org/>) has been making headlines for some years: By not having a child, one could save the world's climate 58.6 tonnes of carbon dioxide equivalents per year. Therefore, population planning is the most effective climate protection. The organisation is supported by well-known celebrities, among them David Attenborough, Jane Goodall, Paul Ehrlich and James Lovelock.

The calculation of "Population matters" (scientifically documented in Seth Wynes/Kimberly A. Nicholas 2017, 1–9, citing Paul A. Murtaugh/Michael G. Schlax 2009, 14–20) goes like this: The ethical premise is that every human being is responsible for all the greenhouse gas emissions of their descendants. The question is then asked how many subsequent emissions ("carbon legacies") are caused by the decision to father a single child (who subsequently begets another child, etc.). Each parent is assigned half of the child's emissions, a quarter of the grandchild's emissions, and so on. The amount calculated by this method for an average British person is then divided by the estimated years of life of the person now living. The result is 58.6 tonnes of carbon dioxide equivalent per year.

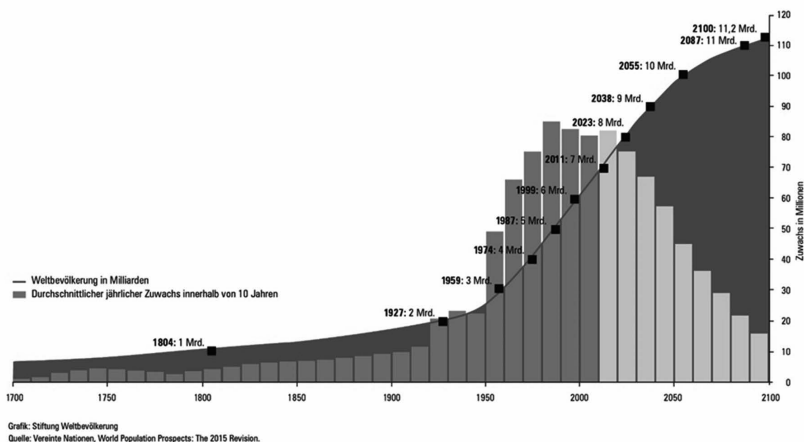
Now, this method alone is highly questionable scientifically. In contrast to their source Murtaugh/Schlax 2009, Wynes and Nicholas (and "Population Matters", which follows them) completely neglect the temporal distribution of greenhouse gases. They thus attribute greenhouse gas emissions in the year 2200 to the year 2017. The question arises as to what scientific knowledge they want to gain from this. Moreover, it remains completely speculative how many greenhouse gases the average British person will emit in the year 2200. Calculating such gases with the quantities emitted today and then claiming that this would be the best climate protection for today (!) is simply nonsense. Anyone who calculates in this way absolves all childless people of any effort to lead a sustainable lifestyle.

Nevertheless, the concern of "Population Matters" does not end there. It is true that humanity's burden on planet Earth is made up of three components: standard of living (sufficiency), efficiency and population size. The more people strive for a high standard of living without being efficient, the more the planet is burdened. In principle, it is therefore correct that a concept of sustainable development must also ask about population development and plan for it accordingly. The question, however, is how this can be done.

Let's first look at the forecasts: The United Nations expects there to be 11.2 billion people by the end of the century. According to their very cautious forecast, this will also be about the maximum value, so that the number will go down again from then on. Much earlier, namely in a few years, global population growth will slow down (represented in the chart by the grey bars). While between 1987 and 2023 one billion people were added every 12 years, according to this estimate the next billion will take 15 years—from 2023 to 2038—and the one after that even 17 years—from 2038 to 2055. Many experts even suspect that the decline will be much stronger than predicted by the United Nations and that we might already reach the maximum in 2070, which would then be below 10 billion people.

Table: Historic development of world population; red line = world population (billions), grey bars = annual average growth over ten years (graph: Stiftung Weltbevölkerung, source: United Nations)

Historische Entwicklung der Weltbevölkerung



Nevertheless, even 10 billion people are too many for the planet if they want to live reasonably well. From an ecosystem perspective, it is helpful to quantify the biomass of all vertebrates on earth: while 10,000 years ago 99 per cent of the biomass came from wild animals and only 1 per cent from humans, today it is the other way round: 1 per cent of the biomass comes from wild animals, 67 per cent from farm animals and 32 per cent from humans. The price of the gigantic expansion of humans and their animal food resources is therefore the displacement of their resource competition in the form of wild animals. Now, for a long time this displacement was not conscious, and there were hardly any opportunities for birth and population planning. Today, however, when we have these opportunities, the question arises as to how many people we should expect the planet to support in the long term. It is obvious that it must be fewer than today. However, it is arbitrary to give an exact number as long as the other two parameters of the calculation, i.e. lifestyle and technical efficiency, have not been determined. Moreover, population planning has long-term horizons: if one child more or fewer is brought into the world today, this will only have a noticeable impact on the overall development of the climate and biodiversity in two to three generations. The time horizons of sustainable development, on the other hand, are much shorter:

we are talking about climate and biodiversity targets that must be achieved by 2050 at the latest. That is not even one human generation away.

Nevertheless, in order to gain perspectives, a more precise analysis of the population development that is currently occurring and will occur in the near future is necessary (according to UN investigations or estimates):

- In *industrialised countries*, the birth rate is already mostly well below 2.1, the value required for a constant population. This means that without immigration, the populations in industrialised countries will shrink at least in the medium term. Many are already shrinking today.
- In the *emerging countries*, too, the birth rate is already mostly below 2.1, but their populations are still growing for the most part because the middle cohorts of current parents (aged between 20 and 45) are very strong. Admittedly, the population will also decline there in the foreseeable future, from around 2040 or 2050, in China even from 2020.
- The development in the *developing countries*, especially in sub-Saharan Africa, is completely different: here the birth rate is currently still well above 2.1, albeit with a downward trend. The populations of these countries are currently still growing strongly but will reach their peaks before the end of this century.
- Two important factors for population growth, especially in poor countries, are falling infant mortality and rising life expectancy. In Nigeria, for example, life expectancy in 1950 was still below 35 years, in 2000 it was already above 45 years and in 2020 it will already be 55 years. In 2100, the UN estimates it to be around 70 years. In other words, from 1950 to 2100, Nigeria will experience a doubling of life expectancy and, as a result only of this, a doubling of its living population. Population growth is thus by no means only a question of birth rate, but also one of medical progress and better nutrition.

Nevertheless, it is undisputed that the birth rate must also fall in those countries where it is currently still particularly high. And this is where access to contraceptive knowledge and means plays a significant role: while on all continents except Africa between two thirds and three quarters of women of childbearing age have access to such knowledge and means (most in Catholic Latin America, by the way!), in sub-Saharan Africa it is only one quarter to one third—even though women there also wish to be able to decide whether they have children or not (Deutsche Stiftung Weltbevölkerung, press release of 26.9.2017). The political focus must therefore be on Africa—all other continents are already developing in the right direction.

In 1965, the Second Vatican Council, in its pastoral constitution *Gaudium et Spes*, emphasised that there are good reasons for couples to limit the number of their children. Parents were responsible, within the limits of the methods permitted, to make a reflected and conscious decision (GS 51). This statement meant a paradigm shift in Catholic sexual morality, for now active control of fertility on the part of the partners was not only permitted, but even demanded. This paradigm shift has borne fruit in Catholic countries outside Africa—the development in Latin America could not be explained without it. Church schools, marriage preparation courses and youth programmes have raised awareness about a mindful and enlightened approach to one's own fertility—and have been successful. Even Pope Paul VI could not prevent this with the encyclical *Humanae Vitae* “on the right order of the transmission of human life” in 1968. Although the encyclical prohibits so-called “artificial contraceptives” (HV 14), it urges responsible parenthood as an important task for married couples and lists health, economic, psychological and social criteria for determining the responsible number of children (HV 10).

A decisive insight of the last decades is that population policy must be holistic (Johannes Müller 2016, 56–57). It must not be imposed without respecting the autonomy of people and cultures. Coercive state measures or neo-colonialist influences from rich countries contradict the dignity of those affected and the sovereignty of their states. In positive terms, a holistic approach means first and foremost education. Without well-educated young people, education on responsible parenthood cannot be realised. This includes the ability to talk about one's own ideas for the future in a partnership and to make joint decisions. A second important aspect is the fight against poverty and debt relief, fair world trade and the raising of living standards and job opportunities. The better people's basic material security is, the less they feel financially dependent on their own children. Finally, the third major area is the promotion of women and their self-confidence (women's empowerment). Men traditionally care little about family planning, indeed in some societies they insist on sexual intercourse without condoms for reasons of tradition. Women need to be empowered here to hold men accountable. These three core elements of a holistic population policy prove that it must ultimately be understood and conceived as an integral part of development policy.

As mentioned, the time horizons of population planning measures are extremely long-term. We will only see a significantly lower world population than today in one to one and a half centuries (Johannes Müller 2016, 47). In this respect, there is a suspicion that the strong insistence on

population planning by some social groups in industrialised countries is deliberately trying to obscure the view of the actual challenges of sustainable development in the present. It is probably no coincidence that in recent years representatives of the political right have become spokespeople for sustainable population planning. It is precisely these intellectual currents that Pope Francis criticises: “To blame population growth instead of extreme and selective consumerism on the part of some, is one way of refusing to face the issues. It is an attempt to legitimize the present model of distribution, where a minority believes that it has the right to consume in a way which can never be universalized...” (LS 50).

Francis insists on climate justice in the sense of equity all the more insistently in the very next paragraph: “A true “ecological debt” exists, particularly between the global north and south, connected to commercial imbalances with effects on the environment, and the disproportionate use of natural resources by certain countries over long periods of time.” (LS 51) This statement is very apt, for, as shown earlier, 80 per cent of greenhouse gases are emitted by 20 per cent of people and, conversely, only 20 per cent of greenhouse gases are emitted by 80 per cent of people. Given this massive imbalance, the industrialised North must be very cautious about population growth in the South. “That is why the New Zealand bishops asked what the commandment ‘Thou shalt not kill’ means when ‘twenty percent of the world’s population consumes resources at a rate that robs the poor nations and future generations of what they need to survive.’” (LS 95, quoting Bishops’ Conference of New Zealand, Statement on Environmental Issues, 1.9.2006)

Demographic developments take an infinitely long time—measured against the time horizons set by global warming and biodiversity loss. Lifestyle changes and efficiency improvements are possible much faster—and must be possible faster if the Paris target is to be even approximated.

6.6 Sustainability as a link between different discourses

As mentioned at the beginning of this chapter, Markus Vogt (2016, 132) describes the principle of sustainability as a “‘missing link’ between faith in creation and the social discourse on environment and development”. Vogt sees this confirmed by the Worldwatch Institute in Washington, which clearly emphasises that the major religions must assume co-responsibility so that a change of course to sustainable development can succeed. Religions offer far-sighted, long-term spiritual and ethical orientation.

Through their worldwide spread, they provide for global community building and institutional anchoring. They invite participation in the ritual creation of meaning (Gary Gardner 2003, 291–327). Seen in this light, the sustainability discourse is decidedly “religion-producing” (Markus Vogt 2016, 144; cf. also Markus Vogt 2009, 38). However, religions must be careful to act altruistically and offer their service selflessly, without ulterior motives.

But interpreting the concept of sustainability as a link for different discourses also means something for its place in the whole of environmental ethics. I’ll expand a little on this and move to the pictorial level for a moment: all rolling units on a railway have a coupling. Since 1840 (!), the coupling used on most European railway vehicles has been the so-called UIC standard coupling, which must be operated by hand. It has a prescribed shape and height above the top of the rail so that all locomotives and wagons of the same gauge equipped with it can be coupled together. Its replacement by an automatic coupler has been sought for many decades but has not yet been able to gain acceptance because hundreds of thousands of vehicles from all over Europe would have to be converted within a very short time. However, it looks like digitalisation is now heralding the end of the manual coupler.

The standard railway coupling is an excellent metaphor to see where the possibilities and limits of the principle of sustainability lie for environmental ethics. A coupling must be strong and resilient so that it does not break. Sometimes several thousand tonnes hang on the hook and cause great pulling forces. In the literal sense, an enormous amount depends on the coupling. However, a coupling is worth nothing without the wagons it connects. The real substance of a train is not the couplings, but the waggons that transport goods or people.

Markus Vogt hits the mark when he compares the sustainability principle to such a coupling. The sustainability discourse can connect and hold together very different social and natural systems. Much therefore depends on it. But the real part is not the link, the coupling, but the wagon, i.e. the social or natural system: the ecosystem; the social system; the system of art, culture, spirituality and religion; the economic system. It is certainly not easy to hold these very contradictory systems together. Sometimes the link will be strained to breaking point. What is more, the discourse has a purely serving function—it is not an end in itself.

In the structure of this book, the sustainability chapter is right in the middle. Before that, we have developed the fundamentals: scientific, spiritual–theological and philosophical–ethical. In the following, we will draw

conclusions, spiritual, economic–structural–ethical and individual–virtue-based–ethical ones, and finally spiritual ones a second time. They, the foundations as well as the consequences, are the actual substance of environmental ethics. The sustainability discourse is its link, its universal coupling. In the best case, it recedes behind the systems it links and fulfils its task invisibly. However, it can only do this if the different systems mutually recognise each other and meet each other openly. Whether the path to a good future fails does not have to be due to the sustainability concept.

7. More than greenwashing. Ecological conversion

“According to the IPCC, we are less than 12 years away from not being able to undo our mistakes. ... Yes, we are failing, but there is still time to turn everything around. We can still fix this. We still have everything in our own hands. But unless we recognise the overall failures of our current systems, we most probably don’t stand a chance. ... Adults keep saying: ‘We owe it to the young people to give them hope’. But I don’t want your hope. I don’t want you to be hopeful. I want you to panic. I want you to feel the fear I feel every day. And then I want you to act. I want you to act as you would in a crisis. I want you to act as if our house is on fire. Because it is.” (Greta Thunberg 2019)

The house of the earth is on fire—and time is running out. Humanity is running astray—and should actually be panicking. This is what Greta Thunberg said before the World Economic Forum in Davos in 2019. With this, she uses classic Judeo-Christian diction, the diction of apocalypticism. And without mentioning the word, she calls for radical conversion—like Jesus of Nazareth once did.

As unifying and integrative as the sustainability discourse is, it runs the risk of degenerating into “greenwashing”. Left to its own devices, it can hardly defend itself against this. That is the fate of links and couplings: What is coupled to them is out of their hands. This is another reason why it is important to take the steps towards concrete action in a profiled way and to adequately respond to the dramatic situation described in the first chapters in the following chapters. To this end, in this chapter, I will analyse the concept of “ecological conversion”, which is used as a key concept in the encyclical *Laudato si’*. I read it as a theological equivalent of what is secularly called “great transformation” and ask where the specific value of the Christian message of conversion lies in the ecological context. In order to appreciate this in its full depth, the message of conversion of Jesus of Nazareth must be opened up as an apocalyptic concept.

7.1 *The concept of the “great transformation”*

In recent years, one concept in particular has caused a furore in the sustainability debate: the concept of the “great transformation”, which the

German Advisory Council on Global Change (WBGU) chose as the headline and main content of its 2011 annual report (shortly before, Helmut Haberl et al. 2011). This concept addresses both the depth of the crisis and the urgency of its solution (Ulrich Brand/ Markus Wissen 2018, 287). Admittedly, despite an English open-access version of the WBGU’s 2011 Annual Report and some scientific articles on it published in English, the debate has hardly transcended the German-speaking world. Nevertheless, the concept and basic idea seem to me to be valuable in adequately describing the magnitude of the challenge ahead.

The term comes from the Hungarian-Austrian sociologist Karl Polanyi (1886 Vienna–1964 Pickering/Ontario), who published his groundbreaking work “The Great Transformation. The Political and Economic Origins of Our Time” in 1944. It is still considered one of the great works of sociology and describes the industrial revolution as a holistic transformation of society. If the WBGU follows Polanyi’s lead, it is based on the thesis that the ecological transformation that is now necessary is the third comprehensive “revolution” in human culture after the Neolithic and Industrial Revolutions. In terms of time, i.e. quantity, it goes far beyond changes of medium scope (WBGU 2011, 87) and in terms of complexity, i.e. quality, it goes far beyond purely technical (WBGU 2011, 88) or economic (WBGU 2011, 89) changes. Moreover, there are no role models for them in history or in other countries.

Carl Christian von Weizsäcker thinks this is “too much pathos... It is easier to discuss the proposals objectively if one leaves out the outrageous comparison with the industrial revolution” (Carl Christian von Weizsäcker 2011, 246). In contrast to Polanyi and the WBGU, von Weizsäcker believes that the current social structure is ideally suited to solving environmental problems: “When one sees what human medicine is capable of, the solution to the climate problem is one among many problems that the future will solve, even within the given institutional framework” (Carl Christian von Weizsäcker 2011, 247). Von Weizsäcker is by no means alone in this assessment. The term “great transformation” thus marks a dividing line between those who see the environmental problem as a manageable, sectoral problem and favour a kind of “sustainability light”, and those for whom, as for Greta Thunberg, it is a symptom of a fundamentally misguided system in need of complete structural reform. According to Helmut Haberl et al. (2011), fundamental reorientation of the economy and society is needed, not just a few technical repairs.

The WBGU recognises in industrial modernity a serious narrowing of the aspects of a good life to that which is material. Thus, the economy has

gained dominance over all other areas of society: “Since the beginning of the modern era, attitudes and calculations based on individual utility maximisation have prevailed. With the advent of industrial mass production, the ‘good life’ became increasingly equated with material prosperity. In the course of the ‘transformation’ (Polanyi, 1944), an extensive dislodging of the economy from its social and life-world references took place. This functional differentiation of the economic system has given it an autonomy that has enabled hitherto undreamed-of increases in productivity; but it has also led to the social order as a whole being subject to economisation.” (WBGU 2011, 71)

7.1.1 A “transformation of value attitudes”

For the WBGU, it is therefore clearly also about a “transformation of values” (WBGU 2011, 71). This cannot be imposed by force in a democracy. “It must be in harmony with ideas of a good and successful life, which in turn are widespread and attractive.” (WBGU 2011, 71) But the WBGU sees the beginnings of this new value system already emerging. Post-material thinking is no longer the preserve of a small group, as a 2010 survey by the Bertelsmann Foundation proves (WBGU 2011, 72). “The advance of value attitudes oriented to environmental and sustainability aspects, among other things, can be explained by a theory of value change.” (WBGU 2011, 73) This can be empirically proven by the research by Ronald Inglehart and with the help of the data from the World Values Survey (WVS) in most world regions and cultural areas (WBGU 2011, 73). In the fifth wave of the WVS from 2005 to 2008, around 90 per cent of respondents in 49 countries would have rated global warming and the loss of animal and plant diversity as serious or very serious problems in each case (WBGU 2011, 75). Slightly more than half of all respondents would have said that “more attention should be paid to environmental protection, even if economic growth is reduced and jobs are lost as a result” (WBGU 2011, 76). “In other words, those who support sustainability goals are not swimming against the tide (anymore).” (WBGU 2011, 81)

Nevertheless, the WBGU goes on to say that major resistance must be overcome in the case of concrete ecological reforms (WBGU 2011, 82). Often, collision with previous cultural practices is the decisive obstacle (WBGU 2011, 82). Therefore, the consent of the people must be sought. “Thus, transformation cannot be justified by the ‘planetary boundaries’ alone, but also by the ‘open frontiers’ of human existence... As a rule, a

‘good life’ depends on the fulfilment of certain basic needs, including the existence of individual leeway and options that must be secured by material standards. In addition—transculturally—immaterial factors play a role in the ‘pursuit of happiness’, such as recognition by others, embedding in communities and networks of various kinds, especially family ones, but also the fulfilment of aesthetic and hedonistic pleasures. Any transformation strategy that can make it plausible that proposed or prescribed changes are compatible with these immaterial goals, i.e. that they not only do not have to dampen subjective life satisfaction, but can even increase it, is more promising than a strategy that prescribes reductions solely out of external constraints and thus triggers problem repression and loss aversion.” (WBGU 2011, 84–85)

In a nutshell: “Self-restraint to avoid dangerous climate change and other damage to the Earth system is not a revolution in the history of ideas” (WBGU 2011, 85), because people are sufficiently familiar with victim strategies. Therefore, a new narrative is needed so “that prosperity, democracy and security are shaped in relation to the natural limits of the Earth system” (WBGU 2011, 281). This narrative is repeated and invoked several times, but nowhere unfolded. It is about “stability, security, prosperity and fairness in a closely interconnected global society within the limits of the Earth system” (WBGU 2011, 346). “The state... takes into account the limits within which the economy and society can develop on a finite planet.” The regulatory framework set by the state serves the options for freedom of present and future generations (WBGU 2011, 295) and the “survivability of humanity within the natural limits of planet Earth” (WBGU 2011, 337).

In view of the ambitious goals aroused by the title “Great Transformation”, the proposed solutions thus remain rather narrow. The report also concentrates very strongly on global warming and almost completely ignores the even more pressing problem of biodiversity loss. And for global warming, differentiated technical proposals are made over long stretches, but hardly any lifestyle issues are touched upon. This comment hits the nail on the head: “Overall, however, there is hardly any mention of people in the WBGU report.” (Adelheid Biesecker/ Uta von Winterfeld 2013, 162)

7.1.2 Existing power relations as the biggest obstacle

It is evident that transformation processes cannot be carried out overnight, but are made up of many small transformations: “In history, therefore,

there are no temporally clearly determinable tipping points of development that herald a change of epoch. Rather, historical and comprehensive transformations result from ‘frequency condensations of changes.’” (WBGU 2011, 91) Nevertheless, the crucial question remains as to why, despite the shift in values towards post-material thinking in everyday actions, there is no trend towards sustainable development, but on the contrary, even in industrialised societies, there is still a rising or at most stagnating level of environmental consumption.

The WBGU describes the transformation pathways strongly in line with John Grin et al. (2010). They interpret transformation as the co-evolution of different societal subsystems that influence each other. The multitude of actors makes the process difficult to control. However, it can be promoted through the moral and structural support of pioneers. Overall, the WBGU is concerned with “embedding the economy in the limits of the Earth system” (WBGU 2011, 24). Yet one gets the impression that both the WBGU and Grin and colleagues do not really look the force of economic development in the face. This is diametrically opposed to the title of the study because: “Karl Polanyi, to whom the WBGU refers with its concept of transformation, pointed not only to the necessity of social and political embedding of the economy, but also and especially to the aggressive expansionism of the self-regulated market with destructive consequences for people and nature, for societies and their values. His vision is an industrial society not based on the market, in which labour, land and money or capital are withdrawn from the market.” (Adelheid Biesecker/ Uta von Winterfeld 2013, 163)

The accusation that Polanyi is received too superficially by the WBGU appears not only once: “According to Polanyi, the ‘Great Transformation’ has thus transformed social, political and economic relations in such a way that markets are less and less embedded in traditional conventions. On the contrary, social space is increasingly subordinating itself to market logic... The market system makes excessive demands on people and nature and thus leads to counter-movements for political regulatory protection. The development dynamics of capitalist industrial states will therefore be crisis-like... Proposals for solutions ... should therefore start at the structural roots of economic utilisation, which affects patterns of use and distribution across sectors.” (Maja Göpel/ Moritz Remig 2014, 72) Ultimately, the 2011 WBGU report is structurally blind and neglects to turn the crucial levers: “Recourse to Polanyi allows for an integrated, systemic as well as structural view of multiple crises” (Maja Göpel/ moritz Remig 2014, 72).

In chapter 8, we will address these structural dimensions of the eco-social crisis.

Structural changes in the market economy do occur in the WBGU Annual Report 2011: in Chapter 4.5.2 under the heading “Financing the Transformation” (172–182); in Box 5.2.1 by presenting the debate on the role of economic growth (188–189); and in Chapter 5.2 “Policy Instruments for Managing the Transformation” (190–193). But from the division into two chapters and from the headings one already can see that the central, structure-changing role of carbon credits, carbon taxes and other instruments is not really recognised. Thus, no comprehensive and coherent structural change of the economic system can be envisaged.

Significant shifts in power are associated with economic structural reforms. In its historical analysis, the WBGU describes very aptly that the industrial revolution was accompanied by the disempowerment of the aristocracy and had a tendency towards equality for all, but that it also established or at least massively expanded the superiority of Western states over other world regions (WBGU 2011, 95). On this basis, the WBGU predicts a shift in power in the upcoming transformation: At the national level, power is shifting from the losers to the winners of the transformation. At the international level, power relations will change through the shift from competition to mutual dependence. However, the fact that both shifts are associated with considerable upheavals is not reflected further.

For this reason, Ulrich Brand and Markus Wissen consider the social science analysis weak because it does not identify the potential drivers of change. What is needed, they argue, is to understand the social relations of power and domination that cause and mask the crisis and that are inherently contradictory. As a key concept, they propose the “imperial mode of living” (IML) of the global North (Ulrich Brand/ Markus Wissen 2018, 287), which they define as follows: “In times of globalizing capitalism the IML means a ‘good living’ for parts of humanity at the cost of others... the IML depends on an external sphere from which it gets its resources and to which it can shift its social-environmental costs. Therefore, it is based on”diverse processes of 'externalization' (Less“nich 2018) a”d 'separation'—between ‘valuable’ (market) processes, commodities and wage-labour and ‘worthless’ other forms of labour or nature (Biesecker and Hofmeister 2010)... It became a mass phenomenon to the extent that the 'ener'y available per dollar earned' increased (Huber 2013, '179). Soc'etal relations were stabilized due to their environmentally and socially unsustainable character.” (Ulrich Brand/ Markus Wissen 2018, 288)

The imperial way of life is thus defined, on the one hand, by the externalisation of ecological and social costs and, on the other hand, by the strict separation of two economic “worlds”, so that in one energy is becoming cheaper and cheaper. And since IML has extended to the upper and middle classes of many countries in the Global South since the 1980s, the “great acceleration” already mentioned in chapter 2.6 occurred in global terms (Ulrich Brand/ Markus Wissen 2018, 288). Even these few considerations give a good indication of the explanatory value of the IML model (Ulrich Brand/ Markus Wissen 2018, 289): it explains the central blockages in overcoming unsustainability, for this is deeply inscribed in political, social and economic structures. Consequently, it is a social crisis, not of “humanity” in the abstract, but of a very specific group and its form of domination. The productivity gains of the Global North are not even conceivable without the Global South—they come about through cost externalisation. Consequently, the emerging countries are now also trying to externalise their costs—just think of China.

Eva Lövbrand and colleagues (2015, 213) have criticised the “post-social ontology” of the Anthropocene discourse in this sense. If the human dimension of ecological change is emphasised, this tells us little about social dynamics. Similarly, the model of planetary boundaries per se obscures global inequalities. However, according to Brand and Wissen (2018, 290), it is precisely the struggle against these inequalities that leads to the best concepts of sustainability. For the alternative to IML is a “solidary mode of living” (Ulrich Brand/ Markus Wissen 2018, 291). In this respect, there is every reason to complement the natural science discourses of the Anthropocene and planetary boundaries with the social science discourse of the Great Transformation. However, the latter must then also be understood and developed as a social science complement, as in the contributions of the authors mentioned above.

As a theologian, the question that arises for me is whether and, if so, what the theological counterpart, namely the talk of “ecological conversion”, can bring to the sociological and political analysis of the imperial way of life. This will be examined in the next section.

7.2 *The Concept of “Ecological Conversion”*

The call to repentance is at the core of the messages of John the Baptist and Jesus—so we are at the very foundation of the Gospel. And for both of them the message of repentance stands in an apocalyptic horizon of

thought—the theology of their time was simply apocalyptic, and so this figure of thought belongs to the theological heritage of both personalities. Unlike John, however, Jesus’ call to repentance is not preceded by the threat of judgement, but by the approaching reign of God: “The time is fulfilled, the reign of God (βασιλεία τοῦ Θεοῦ) is at hand. Repent and believe in the gospel!” (Mark 1:15)

The call to repentance, at least according to Mark, is thus directed first and foremost towards the model of comprehensive peace in Creation. Jesus, as the new Adam, lives in peace with wild animals (Mk. 1:13). The reign of God has thus come close precisely because in Jesus’ coming peace has dawned with the whole of Creation. The *offer of* divine love made in Jesus’ turning to Creation enables and encourages human beings to open themselves to this turning and to do their part out of it. Jesus’ call to repentance therefore transcends every sinister threat from the outset as well as every performance-oriented work’s righteousness. The willingness to repent may be triggered by warning signs alone—but it can only be nourished in the long term by gratitude and the feeling of being secure, supported and accepted.

Nevertheless, the Greek verb μετανοεῖν and the noun μετάνοια, literally “to rethink”, as well as the underlying Hebrew שׁוּב, translated as “to return, to turn around, to convert”, contain the idea of existentially *comprehensive reorientation*. Conversion demands the whole person; Jesus’ claim is total. In baptism, which was already connected with the call to conversion in John the Baptist, this totality of the claim becomes clear: it is about a *change of dominion*. The Christian baptismal confession verbally includes turning away from evil and turning towards God. In the symbolism of immersion and re-emergence, this process of faith is sacramentally condensed: “So you also should understand yourselves as people who are dead to sin but alive to God in Christ Jesus” (Rom. 6:11). This change of dominion indicates that the question of power is at stake: Who has the power? Who is king? To whom and to what logic do we submit?

In the call to repentance, the absolute *urgency* of Jesus’ claim becomes clear in view of the *dramatic nature* of the present situation. Presumably, not all the words of judgement and threat that the Gospels put into Jesus’ mouth will have come from him. But it can hardly be denied that Jesus threatened in order to inculcate his message. In his cries of woe, threats and apocalyptic scenarios, the urgency and unpostponable nature of conversion is unmistakably addressed. The reign of God does not tolerate any delay: Now is the time!

Finally, the idea of conversion implies a social *concatenation of the fate of all* among themselves: “You will all perish together if you do not convert!” In the pericope Lk. 13:1–9 this sentence appears twice, as if it were its quintessence. The analogy to the Noah narrative is obvious: human action has an impact on the entire community of creatures. Repentance is not a private matter, but an expression of responsibility for the whole: all creatures are in one boat—none can survive without the others.

In this sense, the Ecumenical Assemblies in Dresden in 1989 and Basel in 1989 already spoke of conversion to peace with Creation and made this idea the guiding matrix of their reflections. For in the horizon of the message of conversion, the depth of the present crisis can be seen very clearly. It is not just an external “environmental crisis” that can be remedied technically, but a crisis of orientation and identity rooted in people’s inner attitude towards Creation. It is rooted in misguided basic attitudes: “There is the delusion that man is capable of shaping the world; the presumption that leads to an overestimation of man’s role in relation to the whole of life; an ideology of constant growth without reference to ethical values...; the conviction that the created world has been handed over to us for exploitation and not for care and nurturing; the blind trust that new discoveries will solve the problems that arise in each case...” (EEA 19). Technology is seen only in terms of its power over nature; this is reduced to its aspect of use and thus perceived in an anthropocentric narrowing; ideas of happiness are guided by the question of having and possessing (Commission VI of the German Bishops’ Conference 1998, (28)–(35)).

So, a little environmental technology and a few ecological actions are not enough. The reversal process that is necessary must start much more fundamentally. It demands the whole human being. It is about a 180-degree turnaround.

At the same time, the quotation from the European Ecumenical Assembly in Basel in 1989 makes it clear that not only are individual misconceptions at the root of the crisis but so are structural misdevelopments. The process of conversion therefore also requires a *reversal of structures*. This realisation was not yet accessible to the people of Jesus’ time. Admittedly, they sensed that the rule of “evil” is supra-individual and corrupts entire networks of relationships. But social structures and their laws have only become scientifically accessible and analysable in the past centuries.

The term “*structures of sin*” first appeared in Latin American liberation theology, officially in the documents of the II and III General Assemblies of the Latin American Bishops’ Council CELAM in Medellín in 1968

and Puebla in 1979. Medellín speaks of “structures of oppression” and “unjust structures” (no. 2; 6; 19), Puebla of “unjust structures” (no. 16; 43; 573; 1155; 1257) and “structures of sin” (no. 281; 452). The two Bishops’ Assemblies thus refer to a sinful condition which is not the result of individual behaviour but the effect of wrong or lacking organisation of rules in social subsystems. In the background is the recognition of the inherent dynamics of systems vis-à-vis the individuals who are integrated into them. In the case of culpable conditions in such self-dynamic systems, it is of no use to demand a change in individual behaviour alone. Rather, the systems themselves must also be changed. Responsibility for this lies with those institutions that are entrusted with the rules and structures of a system. In order to be able to change the system in the desired sense, those responsible need a high degree of knowledge about the regulatory mechanisms. The social science disciplines are primarily responsible for this.

For liberation theology in the 1960s and 1970s, the focus is naturally on the largely unregulated, almost anarchic world economic system. As long as there are no fair rules for the global market, the thesis goes, the countries of the South have no chance of securing a fair income for themselves in the long term. Now, in the meantime, there are different regulations for the global flow of goods, but the “imperial way of life” that Ulrich Brand and Markus Wissen diagnose still exists. If we take the idea of conversion of structures further here, then those economic structures that shape and nourish this imperial way of life must be transformed into their opposite. Individual and structural conversion belong together and can only have a sustainable effect together.

7.3 Conversion as an apocalyptic programme

“Antarctic ice could melt completely!” was the headline of the German BILD newspaper on the symbolic 11th September in 2015 and added: “German researchers sound the alarm”. It was referring to a study published the same day by the Potsdam Institute for Climate Impact Research, which calculated the worst-case scenario in the event that humanity burns up all available fossil resources for energy production in the medium term. The Antarctic ice would melt completely, and the sea level would rise by three metres per century or by 58 metres in total (Ricarda Winkelmann et al. 2015).

Even if one takes into account that the BILD newspaper, by omitting the time horizons, audium es the scientific forecasts even more, the example of the study itself reveals a methodology that has characterised much of the climate research of recent decades: It works “apocalyptically”. In terms of methodology, it is mainly oriented towards worst-case scenarios; in terms of content, it focuses on objects that can be sure of public attention because they are visually very memorable. Thus, of the three environmental media soil, air and water, the latter can be depicted most visually (melting of the poles and mountain glaciers, flood disasters, etc.). And among the many animal species affected by global warming, the large mammals enjoy the highest attention. In this way, the polar bear (large mammal) on an ice floe drifting in the sea (environmental medium water) has become one of the most important images of global warming.

The characterisation of scientific publications on climate research as apocalyptic is by no means meant to be pejorative or even disqualifying. On the contrary: the apocalyptic tradition of the Christian message going back to Jesus of Nazareth makes it clear that this is a tried and tested, perhaps even indispensable means when the underprivileged demand their rights vis-à-vis the powerful of the world. Only these powerful people use the term “apocalyptic” to discredit an idea and preserve the status quo (Michael Rosenberger 2013; for the following, see also Michael Rosenberger 2016).

Now, apocalyptic thinking is a decidedly religious programme. It is about power and powerlessness, about conversion and new beginnings, about global destruction and hope for a new earth. It is precisely from this perspective that I would like to read the encyclical *Laudato si'*: To what extent can apocalyptic figures of thought be found in it? And how are these theologically interpreted and deepened?

7.3.1 Apocalyptic figures of thought in the perception of the world

“A very solid scientific consensus indicates that we are presently witnessing a disturbing warming of the climatic system” (LS 23). “If present trends continue, this century may well witness extraordinary climate change and an unprecedented destruction of ecosystems, with serious consequences for all of us” (LS 24). With these two statements at the beginning of the encyclical, the Pope unmistakably brushes aside all claims by the so-called climate sceptics that there is no global warming or that it is not anthropogenic. As is well known, lobby groups have tried to convince the Pope

of the opposite, and with Cardinal George Pell, the prefect of the Secretariat for the Economy, a proven climate sceptic sat in the Vatican (on his theses: see Michael Rosenberger 2013a). Francis, on the other hand, rightly endorses the scientific opinion that has been held by an overwhelming majority of experts since the 1980s and rejects “denial of the problem” (LS 14).

For the Pope, the dramatic nature of the challenges becomes particularly clear when the imbalances between rich and poor are taken into account: “We all know that it is not possible to sustain the present level of consumption in developed countries and wealthier sectors of society, where the habit of wasting and discarding has reached unprecedented levels. The exploitation of the planet has already exceeded acceptable limits and we still have not solved the problem of poverty” (LS 27). “We know how unsustainable the behaviour of those who constantly consume and destroy is, while others are not yet able to live in a way worthy of their human dignity” (LS 193). These considerations converge strongly with the thesis of the “imperial lifestyle”. To bring the resulting drama to the point, the Pope states that with the challenge of leaving “a habitable planet for future generations”, “our own dignity is at stake” (LS 160). It is a question of all or nothing.

So, there is no question that Francis sees the current environmental destruction as dramatic. But how has humanity reacted to the dramatic nature of the challenge? Francis criticises the current generation with harsh words (and does not differentiate between individual groups here, but this does not mean that he does not see the differences). For him, “the post-industrial period may well be remembered as one of the most irresponsible in history” (LS 165). For it only cloaks itself in a bit of ecology in order to postpone the steps that are actually necessary: “As often occurs in periods of deep crisis which require bold decisions, we are tempted to think that what is happening is not entirely clear. Superficially, apart from a few obvious signs of pollution and deterioration, things do not look that serious, and the planet could continue as it is for some time. Such evasiveness serves as a licence to carry on with our present lifestyles and models of production and consumption. This is the way human beings contrive to feed their self-destructive vices: trying not to see them, trying not to acknowledge them, delaying the important decisions and pretending that nothing will happen.” (LS 59)

In this context, as in the Apostolic Exhortation *Evangelii audium*, the concept of indifference appears—towards the environmental crisis (LS 14), the poor and environmental refugees (LS 25; 52) and non-human

creatures (LS 92). For Francis, this indifference is one of the greatest errors of contemporary society and one of the greatest obstacles on the path of conversion. At the same time, he is aware that the indifferent are also to be found in the Church and “some committed and prayerful Christians, with the excuse of realism and pragmatism, tend to ridicule expressions of concern for the environment. Others are passive; they choose not to change their habits and thus become inconsistent.” (LS 217)

The indifference of the people corresponds to the inactivity of politics. Francis notes “weak international political responses” (LS 54). “Politics and business have been slow to react in a way commensurate with the urgency of the challenges facing our world” (LS 165). And he warns, “If politics shows itself incapable of breaking such perverse logic, and remains caught up in inconsequential discussions, we will continue to avoid facing the major problems of humanity” (LS 197). He sees the core of the problem here in the subjugation of politics “to technology and finance” (LS 54; cf. also LS 109; 189).

Instead of indifference and inaction, “we should be enraged by the injustices that exist among us” (LS 90). A kind of “holy anger” would be necessary to achieve tangible progress, for time is pressing (cf. LS 13). Like Paul VI, Francis inculcates “the urgent need for a radical change in the conduct of humanity” (LS 4): “All of this shows the urgent need for us to move forward in a bold cultural revolution” (LS 114). Again and again, the Pope describes the necessary measures as “urgent” (LS 173; 175; 189; 201 et al.).

Like John Paul II. (General Audience on 17.1.2001, cited in LS 5), Francis uses the theological concept of (ecological) conversion for the “radical change” or the “cultural revolution”, to which a separate section of the encyclical is dedicated (6.III). For him, the current environmental crisis is a call “to profound interior conversion” (LS 217). Francis quotes the Australian bishops in this context: “We need to experience a conversion or change of heart” (LS 218, citing Australian Catholic Bishops Conference 2002, 4), and he stresses the communitarian character of this change: “The ecological conversion needed to bring about lasting change is also a community conversion.” (LS 219)

In the good tradition of liberation theology and following in the footsteps of his two immediate predecessors in the papacy, Francis emphasises that an individual ethical change of heart alone is not enough. In addition—according to one of the “red threads” that runs through the entire encyclical (LS 16)—there must be a fundamental change in economic and political structures: “Every effort to protect and improve our world entails

profound changes in 'lifestyles, models of production and consumption, and the established structures of power which today govern societies' (SRS 34)" (LS 5). "My predecessor Benedict XVI likewise proposed 'eliminating the structural causes of the dysfunctions of the world economy and correcting models of growth which have proved incapable of ensuring respect for the environment [...]' (LS 6, citing Benedict XVI, Address to the Diplomatic Corps accredited to the Holy See, 8.1.2007). Because the current economic system denies the poor in particular access to an adequate livelihood, Francis assesses it as "a system of commercial relations and ownership which is structurally perverse" (LS 52), and he concludes, "What is needed, in effect, is an agreement on systems of governance for the whole range of so-called 'global commons'" (LS 174).

One, if not the only major weakness in the content of the encyclical is the lack of understanding of the inherent logic of the economic system. It is true when Francis says: "The environment is one of those goods that cannot be adequately safeguarded or promoted by market forces." (LS 190, quoting Pontifical Council for Justice and Peace, *Compendium of the Social Doctrine of the Church*, 470). And he holds the key to solving this problem when he calls for everyone to bear the costs of the environmental damage they cause (LS 195) and for politics to translate this principle into rules in the market (LS 196). But he does not use the key to open the door to a transformation of the international economic order: He dismisses the only instrument he names that goes in this direction, emissions trading, as too quick and easy a sham (LS 171). Here, Francis is mistaken, and there have been bishops' conferences whose opinions would have advised him to make a different assessment.

7.3.2 Apocalyptic figures in theological interpretation

In the description of the defections of our present life and economy, apocalyptic paradigms thus take up a great deal of space. They occupy, as it were, the key positions of the papal analysis. But what about their theological interpretation?

First of all, the Pope refers back to the classical figure of thought since Aurelius Augustine of the counterposition of humility and arrogance. The deepest cause of the environmental crisis, according to Francis, is the arrogance of man, who puts himself in the place of God: "The harmony between the Creator, humanity and Creation as a whole was disrupted by our presuming to take the place of God and refusing to acknowledge

our creaturely limitations. This in turn distorted our mandate to 'have dominion' over the earth (cf. Gen. 1:28), to 'till it and keep it' (Gen. 2:15)." (LS 66) In this arrogance, the rich are "vainly showing off their supposed superiority" over the poor (LS 90). Conversion means conversion to humility (LS 224), to humilitas, the grateful affirmation of being created from humus, of nourishing oneself from the fruits of humus and of returning to humus at the end of life.

As a biblical foil to illustrate the dramatic nature of the current environmental crisis, but also the path and hope for its solution, the Pope, like a large part of the Christian and secular environmental movement, chooses the story of Noah and the great flood. With it, he interprets the problem that the wrongdoing of some is life-threatening for all: "when justice no longer dwells in the land, the Bible tells us that life itself is endangered. We see this in the story of Noah... These ancient stories, full of symbolism, bear witness to a conviction which we today share, that everything is interconnected, and that genuine care for our own lives and our relationships with nature is inseparable from fraternity, justice and faithfulness to others." (LS 70) But the Noah narrative also opens up an encouraging perspective for the future through God's interaction with a single human being: for thus it is possible "through Noah... to open a path of salvation. ... All it takes is one good person to restore hope!" (LS 71)

Klaus Vondung observed a "docked apocalyptic" in many texts of the secular environmental movement as early as the 1980s (Klaus Vondung 1988, 12). One thinks in apocalyptic doomsday scenarios, but has no perspective of hope, as it belongs to classical Jewish and Christian apocalyptic thinking. Pope Francis is animated by hope in his environmental encyclical: "Hope would have us recognize that there is always a way out, that we can always redirect our steps, that we can always do something to solve our problems." (LS 61) Even in the most difficult times, "the faithful would once again find consolation and hope in a growing trust in the all-powerful God... The God who created the universe out of nothing can also intervene in this world and overcome every form of evil. Injustice is not invincible" (LS 74). And so he concludes the encyclical with an urgent wish: "May our struggles and our concern for this planet never take away the joy of our hope." (LS 244)

7.3.3 "Laudato si'" as gentle apocalypticism

For a papal pronouncement, the tone of the encyclical is strikingly apocalyptic. This undoubtedly has to do with the fact that the Pope sides with the powerless, the poor and disadvantaged people and the desecrated earth. He considers their situation hopeless without serious changes, and so he cries out with them for a change in conditions.

More than the encyclical's rational, scientifically based content, it is this emotional, urgent and motivating tone that distinguishes the letter and was also publicly perceived. The greatest gain of the encyclical does not therefore lie in new insights in terms of content. In terms of natural science, the Pope can only adopt what the overwhelming majority of experts agree on anyway. Theologically, too, much has been achieved in the last two decades, which the Pope adopts and summarises. The big plus is what Francis himself states as the goal of his letter: "More than in ideas or concepts as such, I am interested in how such a spirituality can motivate us to a more passionate concern for the protection of our world. A commitment this lofty cannot be sustained by doctrine alone, without a spirituality capable of inspiring us, without an 'interior impulse which encourages, motivates, nourishes and gives meaning to our individual and communal activity' (EG 261)." (LS 216) There is no question that this passion is intensely palpable from the first to the last page.

Apocalypticism always thinks in cosmic dimensions that reach beyond the boundaries of a group or religion. It does not need to be emphasised that this transboundary character also characterises the encyclical. Finally, the glaring focus on what is identified as a key problem for the future of humanity is apocalyptic in character and at the same time belongs to the heart of the Christian mission: "Living our vocation to be protectors of God's handiwork ... is not an optional or a secondary aspect of our Christian experience." (LS 217) Responsibility for fellow creatures and the common house of Creation is part of the core of the Judeo-Christian faith, which perceives nature as a gift on loan from God. This thought, which is only explicitly expressed in the one quoted passage, is the underlying understanding of the encyclical.

7.4 *The added value of a theology of conversion for the project of the great transformation*

At the end of this chapter, let us ask about the added value of a theology of conversion for environmental ethics. Of course, sociological, political and economic analyses are necessary to identify and elucidate unjust "structures of sin" (chapter 8). They cannot be replaced by theology. However, theology makes a genuine contribution, which becomes outstandingly visible in the paradigm of ecological conversion. More than the sociological talk of the great transformation, the theological talk of conversion makes it clear:

- It is possible—"yes, we can!" Even with a lower standard of living, we are gifted people and will certainly achieve not less, possibly even more quality of life (chapter 9).
- It is urgent—time is running out! The emotionality that resonates in the call to convert makes this urgency more palpable (not more visible!) than the rational analysis of the natural and social sciences. Apocalyptic images of terror reinforce it. Such images are necessary and belong to truthfulness. The "globalisation of indifference" (EG 54) thus becomes more clearly recognisable as the greatest psychological obstacle to a great transformation.
- We are free from the pressure to succeed and from this freedom we can act all the more decisively. As much as conversion theology pushes and pressures, it also conveys the message: "Stick to your commitment and don't get side-tracked!" Act quickly and decisively, but don't look at whether your actions make any difference on a global scale! There is a lot of "committed serenity" in the call to repentance (chapter 10).

On the website of the Mercator Research Institute for Global Commons and Climate Change (MCC), there is a CO₂ clock (<https://www.mcc-berlin.net/forschung/co2-budget.html>). This clock runs backwards and shows how much carbon dioxide the world's community is still allowed to emit if it wants to reach the Paris target of 1.5 to a maximum of 2 degrees. After a short time, you can no longer stand to look at this clock emotionally. A feeling of trepidation arises, and that is intentional. Perhaps without reflecting on it, the MCC is using apocalyptic methods here. This is a good thing—we need the drastic warning in order to take action—and yet one has to be careful not to end up in a "docked apocalyptic" situation. Apocalypses undertake a tightrope walk.

7.4 The added value of a theology of conversion for the project of the great transformation

They want to activate to the maximum—and yet must not make themselves dependent on success. For this tightrope walk, spirituality of ecological conversion is a great help. It can provide the necessary freedom from giddiness that is indispensable on an exposed ridge.

8. Putting a price on values. Structural changes towards an eco-social market economy

Shortly before Greta Thunberg's climate strike began in August 2018, many people from Germany or Austria flew to Rome, Paris or London at the weekend. Flying was simply outrageously cheap—many could not resist the temptation. And it was true: the much more environmentally friendly train journey to the next big city was usually more expensive than the flights in question. Since the climate strikes by Greta Thunberg and millions of other young people from Fridays for Future, a certain "flight shame" has indeed emerged, pushing back the most extreme excesses of this form of mobility. But the problem remains that prices do not tell the "ecological truth". In major consumption decisions, this often leads even very environmentally conscious people to choose the more environmentally damaging product for price reasons. They cannot or do not want to afford the better but more expensive one.

So, the question arises as to what framework conditions ecological conversion needs in order to really take place. "It's the economy, stupid" is the famous dictum of former US President Bill Clinton. If you want to ecologise a society, you have to start with the structures of the economy. In this chapter, I therefore first analyse the problem of the commons, which is the root of the problem in economic terms. Then I discuss the most important proposals for eco-social structural reform of the market economy. The questions of how such reform can position itself in the global market and what it is about economic growth, as the previous driver of innovation, that situates the reform models in larger contexts.

8.1 *Common good versus individual good. The problem of the commons*

In the midst of the progress optimism of the 1960s, the ecologist *Garrett Hardin* (1915–2003) sounded a shrill siren: in an essay entitled "The Tragedy of the Commons" for the journal *Science*, he claimed in 1968 that there were human problems for which there was no technical solution, but only a solution at the level of values and morals. He calls this category of social problems "no technical solution problems" (Garret Hardin 1968, 1243). Even the famous "invisible hand" of Adam Smith, i.e. the

immanent automatism of the free market, cannot solve such problems (Garret Hardin 1968, 1244). The sum of individual preferences ("the greatest happiness of the greatest number") is not automatically the good for altogether.

So, according to Hardin, there is a "*tragedy of the commons*", which he explains with recourse to the communal pasture, precisely the commons, which has been widespread since the Middle Ages: On a communal pasture, each herdsman sensibly seeks the maximum for his own advantage. If he puts one animal more on the pasture than the others, the total amount of fodder per animal will still be almost the same, so that the gain corresponds almost exactly to one additional animal. However, the loss caused by overgrazing is divided among all herders, so for him it is very small compared to the profit. Economically, it is therefore reasonable for the shepherd to put one more animal on the pasture and then one more and one more... But this is reasonable for all the shepherds involved, and they will all do it this way. The result is that in the end everyone is deprived of the food basis for their livestock—everyone makes a heavy loss because their animals starve to death.

Now, the medieval shepherds in a village have found solutions to this. However, according to Hardin, these have so far been too little reflected on and generalised to be applied to the major environmental problems of the present, for example, deep-sea fishing, the pollution of the environmental media with pollutants and the population explosion. In all these cases, rationalisation, i.e. increasing technical efficiency, is not effective; what is needed is rationing, i.e. the wise restriction of use, sufficiency. The key question then is: "How to legislate temperance?" (Garret Hardin 1968, 1245) Simply appealing to the conscience of those involved is not enough because then the conscientious person would be the stupid one. He would have to act against managerial reason. In the short term, conscience would drive the conscientious person into schizophrenia, and in the long term the conscience would eliminate itself because the business would go under in competition with the unconscientious (Garret Hardin 1968, 1246). What is needed, then, is a social arrangement that exerts coercion. The freedom to use the commons would have to be considerably curtailed and the state would have to rule with a hard hand (Garret Hardin 1968, 1247).

Garret Hardin's description of the problem is excellent. The commons problem can be solved neither by technology nor by the free market. But the solution he suggests of a strong state contradicts the ideas of liberal democracies. They do not want to establish an eco-dictatorship, either right-wing or left-wing authoritarian. Nevertheless, for many years

after Hardin's publication, precisely these two alternatives remained under consideration (cf. Elinor Ostrom 1990, 8–13):

- The "Leviathan" (William Ophuls 1973, 215), i.e. a strong state that has the central natural resources under its control.
- Private companies or individuals (Robert J. Smith 1981, 467) to whom the public resources are transferred as private property in order to give room to the invisible hand of the free market. Even if all users of the commons are granted an equal share of the resource as private property, this works at best for stationary resources such as land, although not optimally, because some land is more fertile in wet weather and some in dry weather. With non-stationary resources such as water use or fisheries, it is completely impossible.

To escape the alternative of Leviathan or privatisation, *Elinor Ostrom* (1933 Los Angeles–2012 Bloomington IN) sets out in search of a *theory of collective action*. She received the Nobel Prize in Economics in 2009 for her research. Ostrom pursues an institutional economics approach, i.e. she develops a contractarian theory for the commons problem: What agreements would the contracting parties make in the original state to solve this problem sustainably and fairly? Ostrom is aware that there is no one and single right answer to this question, but that one of several suitable solutions is agreed upon. In order to constantly deepen their analysis, the contracting parties have to keep mentally oscillating back and forth—one is reminded of John Rawls and his "reflective equilibrium" (John Rawls 1975, 68–71). Ostrom does not explicitly invoke Rawls but emphasises her proximity to contractarian theories (Elinor Ostrom 1990, 42–43 et al.).

Garrett Hardin had already referred to the centuries-old commons solutions in agriculture. Ostrom analyses such models in detail, for example the management of high-altitude alpine pastures in Switzerland and Japan and of irrigation systems in Spain and the Philippines. From the insights gained, she develops the so-called *design principles* that enable the successful management of common pool resources. They are as follows (Elinor Ostrom 1990, 91–102):

- (1) Clearly defined boundaries: Clear and recognised boundaries must be defined between authorised users and non-authorised users, and between community pool resources and the system surrounding them.
- (2) Congruent rules: The rules for the appropriation of resources correspond to the local conditions and the rules for the provision of resources. In other words, the distribution of inputs and the distribution of outputs must correspond to each other and be aligned with the potential of the resources.

- (3) Arrangement of collective decision-making: Most people affected by a resource system can participate in determining and changing the rules of use.
- (4) Monitoring: There must be effective control of the appropriation of resources in order to prevent violations of the rules. Those monitoring the appropriation behaviour of users must be users themselves or accountable to them.
- (5) Graduated sanctions: Users who violate the rules are likely to face graduated sanctions from other users or their representatives, depending on the severity and context of the violation.
- (6) Conflict resolution mechanisms: Conflict resolution mechanisms such as mediation or arbitration need to be quickly accessible to users and their managers, cost-effective and locally based.
- (7) Minimal recognition of organisational rights: The right of users to determine their own institutions is recognised in principle by the state authorities.
- (8) Nested institutions: The activities previously mentioned under numbers 3 to 7 are organised at different levels of nested institutions.

Ostrom's conclusion is obvious: the problems of commons resources can also be solved without privatising these resources and without central state control from above (Leviathan).

In her later research, Ostrom seeks to reconcile her considerations with game theory, which is influential in economics, and to prove that the design principles can be replicated in certain game settings (Elinor Ostrom 2008). The added value of these experiments is the discovery of factors conducive to a sustainable commons: communication, trust and reciprocity. These emerge especially when participants know that they will be together for a longer period of time, that their actions will become known to others, and that common good-oriented actions pay off. If we relate this to the major ecological challenges, the fact that humanity will live together for longer should be known to all. Therefore, the global community needs to establish two more facilitating factors above all: transparency and rules that reward common good action.

A final important insight has been presented more recently by economist Scott Barrett (2007). He distinguishes between *three categories of global public goods* (GPGs), each with its own challenges and solutions:

- "Single best effort GPGs" are global public goods that a single actor makes available to all others. It does so because it hopes to gain an economic advantage from sharing this good with everyone. During a pandemic, for example, one can think of vaccine development and

production: a few companies develop vaccines that all countries can subsequently buy or produce under licence. The ethical challenges are rather low for such goods.

- "*Weakest link GPGs*" are those global public goods where the weakest link in the chain of actors determines success. For example, the eradication of a pathogen is only possible if it is also eradicated in the poorest country in the world. The rich countries therefore have an interest in helping the poor country, because it depends on everyone without exception. Otherwise, the pathogen will eventually return to the rich countries as a mutation and outwit the vaccinations available there. Here, too, the ethical challenges are rather small.
- "*Aggregate effort GPGs*" are those global public goods whose achievement arises cumulatively from the sum of all individual efforts: Not all, but most must actively participate to achieve success. For example, the coronavirus vaccine requires a certain percentage of vaccinated people to achieve so-called "herd immunity". The major environmental problems we are negotiating here all belong in this category: protecting the ozone layer, establishing food security, limiting global warming and preserving biodiversity.

This last category is the most difficult from an ethical point of view because there are two fundamental problems: Firstly, the *free-rider problem* that, if the goal is achieved, those who have not contributed to it will also enjoy the benefit (some enjoy herd immunity without having had themselves vaccinated, or a good world climate without having reduced their greenhouse gas emissions themselves). Secondly, the *insurance problem* that those who pay into the "insurance" cannot be guaranteed that they will get the protection in an emergency (if too few get vaccinated, they will not enjoy herd immunity either, and if too few participate in climate protection, those who have committed themselves will not have a good climate either). With the big environmental problems, there is no individual benefit without collective goal achievement, so the free rider problem and the insurance problem require sanctions. There is a need for transparency and rules that reward common good behaviour and punish behaviour that is detrimental to the common good, as Elinor Ostrom has empirically demonstrated.

At this point, we have identified the key problem: First, there is no way to draw a line between members and non-members of the climate or biodiversity commons (Design Principle 1). All humans inhabit planet Earth, and you cannot "shoot any of them to the moon". And secondly, many of them have strong motivations not to agree to a sanction mechanism

for rule violations (Design Principle 5). Why would they do so if they know that they cannot be excluded from the commons of planet Earth, but profit most as free riders? This is exactly where the similarity between locally limited and globally scaled public goods ends. International politics can only promote the establishment of sanctions—but it has no means of achieving universally binding sanctions. The only "sanction" automatically affects everyone in common: the inexorably continuing global warming and the inexorable loss of biodiversity. But the moment when this "sanction" becomes a drastic "penalty" is still in the future. Many of those who are now politically responsible will not live to see it. But when it becomes the present, it will already be too late to act. This is exactly why the only ones who can exert effective pressure are the youth of today: Movements like Fridays for Future are the only realistic way to achieve a good result in the Ostrom tableau.

8.2 Structural change models for the eco-social market economy

Despite this tricky hurdle before the introduction of a global commons regulation, soon after Garrett Hardin's problem statement, there have been considerations for rules to reward commons-compliant behaviour and to sanction behaviour contrary to the commons. As a reminder, one of the most important goals must be to avoid the rebound effect, i.e. the effect that people use efficiency gains partly or entirely for a higher standard of living instead of dedicating them to the biosphere (chapter 6.3). And this is where an important consideration comes in: People consume more energy not because they have saved energy, but because they have saved money. They spend (often unreflectively and intuitively) a certain, relatively constant financial budget on energy. So, if energy prices remain the same, they will consider what they want to use the money freed up by energy efficiency for. And it is no wonder that, within the same budget range, they will continue to heat larger living spaces more warmly or travel further distances in a more economical car.

This implicitly addresses the solution: Greenhouse gases must be given a price—and this price must increase in proportion to the reduction of their emissions. This method, carbon pricing, is favoured by both the WBGU (2011, 190) and the IPCC (2018, 33). To put it pointedly, if the deeper problem is the economic system, the solution can only lie in reforming its *structure*. The conservation of biodiversity and carbon sinks must be profitable; their destruction and the emission of greenhouse gases must

cost money. Only if monetary mechanisms play the central role will effective climate and biodiversity protection succeed. For if the deeper cause of the threat to global biodiversity is the motive of human profit (LS 32–36), moral and spiritual appeals without economic underpinning will come to nothing. Garrett Hardin described this very aptly early on.

Ecologically appropriate monetary structures are also the aim of the fourth of the twelve "Malawi Principles", which were formulated in a workshop on Malawi and adopted by the Fourth Conference of the Parties (COP-4) to the UN Convention on Biological Diversity in Bratislava in 1998. Their main thrust is: "Given potential gains that can be made by influencing an ecosystem, it is usually necessary to consider and manage the ecosystem in an economic context. Any such programme for managing an ecosystem should: reduce any market distortions that have a detrimental effect on biodiversity; tailor incentive measures to promote the conservation and sustainable use of biodiversity; internalise costs and benefits from the ecosystem concerned as far as possible." In other words:

- subsidies and tax breaks for biodiversity-destroying measures must be reduced;
- financial incentives for the protection of biodiversity should be created;
- the passing on of the ecological or cultural costs of private-sector activities to the general public should be avoided.

What the Malawi Principle 4 formulates for biodiversity protection applies analogously to climate protection. However, establishing monetary mechanisms for climate protection is much easier than for biodiversity protection. Why is this so? Firstly, there is a universal "ecological currency" for greenhouse gases, namely the so-called greenhouse warming potential (GWP). This is the measure of the warming effect of a certain amount of the gas in question within a certain time, usually 100 years, compared to carbon dioxide. The various greenhouse gases can therefore all be converted into one and the same "ecological currency", which is why we speak simplistically of "CO₂ equivalents". Secondly, it is very easy to calculate how many CO₂ equivalents may still be emitted in order to achieve the 1.5 degree target set in Paris in 2015. So, there is a clearly defined supply quantity. According to economic theory, the price is determined from its ratio to demand in a market economy.

Both steps mentioned are much harder to implement for biodiversity. Firstly, what is the ecological value of elephant species compared to bat species? And what is the ecological value of a certain watercourse compared to rough grassland? As the old saying goes, it is difficult to compare apples with pears. Secondly, for biodiversity we know the famous tipping

points at which larger systems collapse much less precisely than for climate (cf. chapter 6.4). We are dealing with living systems whose development is infinitely more difficult to calculate than the purely physical dynamics of the climate. So, despite the TEEB project, we will have to estimate much more roughly and proceed much more tentatively in the area of biodiversity than in the area of climate protection.

However, structural measures must still be taken—at least if the worst is to be prevented. What approaches are there to this? First of all, one can choose a *regulatory solution*: A government or the European Commission can issue a legally binding *regulation* that bans activities that damage the climate or biodiversity entirely or above a certain (relative or absolute) threshold. In the European Union, this is the most common environmental policy instrument, because the other instruments hardly fall within EU competence. So, cars are only allowed to emit a certain amount of carbon dioxide per kilometre, and farmers are only allowed to spread a certain amount of manure per hectare of arable land. The advantages of regulations are their quick effect (for example, in the 1980s in response to "acid rain" and forest dieback) and their comparatively high targeting accuracy in local constellations (for example, with regard to the methane content in soil and water). The disadvantages are the lack of flexibility (the car buyer cannot compensate for the purchase of a car with higher consumption by driving fewer kilometres) and the comparatively high costs (the most expensive are always the last per cent that have to be saved—they could often be saved more cheaply elsewhere). A very fundamental disadvantage is that regulations, when used as the main tool, resemble Leviathan, the eco-dictatorship. This generates a lot of ill-will among those affected. Therefore, this tool should be used with great restraint in liberal societies.

Subsidies, financial support from the state, are an economic instrument, even if they are not market-based. For example, photovoltaic systems are subsidised, as are better heat insulation of houses, electric cars and charging stations. Electric cars are also exempt from tax (indirect subsidy). The advantage of subsidies is that they provide a positive incentive for ecological action. Their disadvantage is that they only cure the symptoms and do not rectify the underlying causes. Ultimately, they contradict the market economy and are at best temporary compensation, especially in speeding up the introduction of new technologies. Therefore, subsidies need an "expiry date"—namely when the new technology has become cheap enough to compete in the market without aid.

The mirror image of subsidies is the *dismantling of environmentally harmful subsidies*. A large number of subsidies were introduced for social, economic or location policy reasons, but were not checked for negative ecological effects when they were introduced or were even introduced despite negative effects being known. The sums involved are considerable. A study by the Austrian Institute of Economic Research (WIFO), for example, calculated direct and indirect environmentally harmful subsidies amounting to 3.8 to 4.7 billion euros per year on average from 2010 to 2013 in the areas of energy production, energy use (incl. housing) and transport at the federal level alone. That is about 500 euros per person. "Transport accounted for about half of them, energy for over a third and housing for just under 14%" (Daniela Kletzan-Slamanig/Angela Köppl 2016, 605). For Germany, the Federal Environment Agency puts the volume of environmentally harmful subsidies in all sectors for 2012 at 57 billion euros, or about 700 euros per person (Deutsches Umweltbundesamt 2016, 6). These figures do not even include the EU agricultural subsidies, a considerable part of which is harmful to the environment.

In fact, the environmental policy of most democracies is largely exhausted in regulations and subsidies. Even the reduction of subsidies is pursued only very hesitantly because the recipients have made themselves comfortable with them. Structural reforms, however, are only implemented in homeopathic doses at best. The two major Churches in Germany had already stated in 1997: "An ecological improvement of the social market economy model is not enough. What is needed is a structural reform towards an ecological-social market order as a whole." (Council of the Protestant Church in Germany/German Bishops' Conference 1997, para. 148) Since then, the Churches and Church organisations in German-speaking countries have repeated this demand countless times.

What does "structural reform towards an overall ecological-social market order" mean? In concrete terms, two *structural change models in particular* are being discussed in economics:

The first is a so-called "*quantity solution*": For emissions that are harmful to the climate or biodiversity, certificates are introduced that must be bought on the free market (*emissions trading*). The certificates are issued by state authorities and limited in quantity so that the desired environmental effect is achieved. From year to year, slightly fewer certificates are issued. The motto is therefore "cap and trade". The revenues from the sale of certificates can be used by the state or supra-state body for eco-social purposes or for general tax reduction. The principle was developed by the Canadian economist John Harkness Dales (1920–2007) in 1968 (John Harkness Dales

1968). Its advantages are absolute targeting (never more is emitted than there are certificates on the market) and high economic efficiency (emissions are avoided where they cost little and allowed where their avoidance would be expensive—in sum, emission reduction is therefore achieved at a very low price). The system is therefore perfectly compatible with the market economy. Its disadvantages are, on the one hand, the difficulty of introducing this solution and, on the other, the fact that emissions trading would be equivalent to a second currency above a certain total volume.

A review of Dales' book in 1969 stated: "Almost certainly it will have an important influence on public policy relating to pollution, for it presents a rational and practical approach to the problem, and it is written in terms that the layman can readily understand" (W.R. Derrick Sewell 1969, 386). Unfortunately, this prophecy did not come true to the desired extent.

The European Union introduced emissions trading for some energy-intensive sectors of large-scale industry in 2005. Switzerland started its own emissions trading in 2008 and merged with the European Union's in 2020. Under the Western Climate Initiative (WCI), the US state of California and the Canadian province of Quebec linked their emissions trading systems in 2014. In 2018, the Canadian province of Ontario joined the alliance. However, all these systems suffer from the fact that, on the one hand, they only cover a few sectors of (large) industry, and, on the other hand, they intervene too much. For a long time, for example, the EU gave away most of the certificates for free to companies—with the result that they ended up making a profit by selling certificates instead of paying for them. These systems will only become truly effective if, on the one hand, as many emissions as possible are recorded and, on the other hand, the scarcity of certificates is also adapted to ecological necessities and not just to economic possibilities. The quantity of certificates would also have to be reduced in times of crisis (financial crisis, pandemic) in order to maintain a minimum price. None of this has been the case so far. In 2020, for example, the EU still issued 79 per cent of the certificates it had in 2005. Although this quantity is to be cut by 2.2 per cent in each of the coming years—the targeted climate neutrality by 2040 cannot be achieved in this way. Moreover, 30 per cent of all certificates are still issued to companies free of charge. At least they are no longer assessed according to "grandfathering", i.e. based on a company's previous emissions, but according to the principle of "best available technology", i.e. measured against the most efficient technology the industry has to offer. After all, EU certificate trading currently covers only just under half of all greenhouse gas emissions. Transport, for example, as one of the largest emitters, is not included.

Overall, therefore, it can be acknowledged that the system has improved considerably over the years. However, it is still far from being ecologically resoundingly effective.

Some multinationals also use emissions trading internally. Departments that emit less can sell certificates to departments that emit more. Accordingly, corporate management sees which departments work more ecologically and which do not, and can reward or sanction this (for example through bonuses and maluses on salaries). Emissions trading thus becomes a management tool that, depending on its design, can be quite helpful.

It should be noted that the certificate trading model can be used predominantly for climate protection. After all, trading in certificates presupposes that it does not matter where the corresponding savings are made. The only thing that matters is that it happens. The model is therefore less suitable for the protection of biodiversity. Here, one would have to rely on the second proposed model, which is in principle also practicable for climate protection, but has more advantages for biodiversity protection.

In addition to the quantitative solution of emissions trading, a second instrument is the so-called *tax solution*, i.e. *ecological or eco-social tax reform*. Its inventor was Hans-Christoph Binswanger (1929 Zurich–2018 St. Gallen). His main interest since the 1960s was the connection between the economy and ecology (cf. Hans-Christoph Binswanger et al. 1979 and 1983). From his reflections, Binswanger develops a model that skilfully links aspects of social and labour market policy with environmental policy. For on the one hand, there are many workers—but due to their social security (employer's contributions to health, nursing care and unemployment insurance, etc.—the so-called non-wage labour costs), they are very expensive for an employer. On the other hand, there are few environmental resources—as public goods they cost nothing. From this imbalance, Binswanger develops a redistribution model: the state should levy slightly increasing eco-taxes every year and thus finance an ever larger part of the non-wage labour costs. The employer's share of labour costs would fall without reducing the level of social benefits, and the costs of previously free environmental resources would rise. This would motivate companies to create jobs and protect the environment. Compared to emissions trading, the eco-tax model has the disadvantage that revenues from the eco-tax will fluctuate, but expenditure to reduce non-wage labour costs will remain relatively constant. So, the state sometimes has to pay a lot more. Moreover, the eco-tax has only a medium degree of accuracy in terms of the quantities of greenhouse gases emitted. No one can say exactly how much greenhouse gas will be emitted if the tax is set at a certain

level. However, the eco-tax also has advantages over emissions trading: Its handling is quite simple. Moreover, it is the only strategy that takes social as well as ecological aspects into account, thus directly linking all three pillars of sustainability. And finally, it can also be used for fixed problems such as the preservation of biodiversity, where emissions trading fails.

No matter what a political body decides, some conditions remain equally important for emission allowance trading and the eco-tax:

- The measures should not generate additional revenue for the state but should be designed in a *revenue-neutral way*. What is collected through the sale of certificates or the eco-tax must flow back elsewhere. After all, the greening of the economy should not place an additional burden on it, but only guide it.
- Both models live from *long-term commitments*. This is the only way to create a predictability that engenders innovations. The lifespan of large machines and plants in both the private and economic sectors is in the realm of several decades. The actors must be able to rely on the fact that the structural reform will be continued without interruption within this time horizon and that the investment in a more ecological plant or machine will actually pay off in the end.
- The environmental impact should be recorded as far as possible "*at the beginning of the pipe*". Thus, emission certificates or eco-taxes should already be due when a barrel of crude oil is imported or domestically produced and not when it is burnt. The eco-tax on animal husbandry should be applied to the manure of the animals and not to the end product, meat. On the one hand, this makes the environmental impact of the resource visible to all (!) parties involved, and on the other hand, in view of the higher price, everyone involved will try to get the maximum output out of the resource input—in other words, to be efficient.
- To *avoid social hardship*, accompanying measures will be necessary in any case. However, these should not undermine the increase in environmental consumption, for example by exempting welfare recipients from the eco-tax on heating oil. They, too, should green their lifestyles as much as possible. Therefore, the social assistance rate should be increased for them—then they would have the same incentive as everyone else to live in an environmentally friendly way in order to be able to spend the money saved elsewhere.

Since the Ecumenical Assemblies of Stuttgart, Dresden and Basel in 1988/89, the Churches in German-speaking countries have spoken out countless times in favour of introducing the two models of structural

change. Only Pope Francis sends ambiguous signals in *Laudato si'*. On the one hand, he clearly names the limits of the free market and the "invisible hand": "The environment is one of those goods that cannot be adequately safeguarded or promoted by market forces." (LS 190, quoting Pontifical Council for Justice and Peace, *Compendium of the Social Doctrine of the Church*, 470) He therefore rightly calls for everyone to bear the costs of the environmental damage they cause themselves (LS 195) and for politicians to translate this principle into rules for the market (LS 196). But he rejects the only instrument he mentions, namely emissions trading, as a "quick and easy" sham solution that distracts from the real issue, namely overconsumption by rich countries (LS 171). At this point, one must unfortunately say: Francis has not understood the economic mechanisms here (cf. chapter 7.3.1). In the German-speaking world, the Churches and Church organisations therefore continued to advocate emissions trading and eco-taxes after 2015. However, it is only with the appearance of Fridays for Future that the issue has gained political momentum. For the first time, there is a chance that not only a small "climate parcel" but a comprehensive "climate package", perhaps even an ecological tax reform geared towards climate *and* biodiversity protection, will be realised.

From a theological and ethical point of view, the first thing is a value decision: The spiritual value of Creation as a gift on loan from the Creator to his creatures must be translated into monetary values in the economic system, for what costs nothing is worth nothing. And secondly, ethics' appeal to conscience must be supported rather than counteracted by the economic systems of reward and punishment. It would be hopelessly excessive to demand that people act for ethical reasons in ways that are economically punished.

Although the concepts presented have been known and scientifically recognised for decades, politicians have not yet tackled the necessary structural reforms. Positive incentives such as subsidies for ecological innovations or the expansion of public transport are gladly created. The "aggravating hurdles" for environmentally harmful behaviour, on the other hand, are not wanted because they are unpopular and cost votes in elections. But the consequences are easy to be demonstrated empirically: Switzerland, for example, has uniquely well-developed public transport, and this system is accepted by the population in an impressive manner. But road and air transport have hardly been reduced because they have always remained cheap. Instead of switching from the offer of environmentally harmful to that of environmentally friendly transport, people now

use both, the environmentally friendly and the environmentally harmful. The rebound effect sends its regards.

8.3 *Eco-social market economy in a global context*

One of the biggest concerns in the discussion about eco-social structural changes to the national or European market economy is how to avoid the domestic economy losing out in competition in global markets if it has to meet higher ecological and social standards. Often, this very serious argument is silently linked to the option of introducing emission certificates or eco-taxes only when the whole world joins in. This is obviously a killer argument.

But does it have to be this way? Can structural reforms really only be implemented globally? In fact, the rules of the World Trade Organisation (WTO) do provide instruments to protect national markets against ecological and social dumping. Article XX of the General Agreement on Tariffs and Trade (GATT) is decisive here: "Subject to the proviso that such measures shall not be applied in a manner which would constitute a means of arbitrary and unjustifiable discrimination between countries where the conditions are similar or a disguised restriction on international trade, nothing in this Agreement shall be construed as preventing any Contracting State from adopting or implementing the following measures: ... b) measures for the protection of human or animal life or health or for the protection of plants ; ..."

In Article XX, the GATT formulates ten (!) exceptions that make it possible to unilaterally impose import duties or bans, export tax refunds and implement other measures that restrict the international trade in goods. The condition is that the measures are not arbitrary or without reasonable cause. And one category of potentially appropriate reasons mentioned is the protection of human and animal life or health and plant protection. Climate and biodiversity protection clearly fall into this category. So, if steel is to be imported from a country without emissions trading to a country with emissions trading, the importing country would always be entitled to impose a duty equal to the current emissions price. If the steel goes the other way from a country with emissions trading to a country without emissions trading, the exporting country could refund the emissions certificate price. And if agricultural products are exported from a country with eco-taxes to a country without eco-taxes, or vice versa, the same applies. That would be transparent, fair and appropriate.

For years, this possibility was simply not an issue in environmental policy debates—not even on the part of the proponents of certificate trading and the eco-tax. In the meantime, leading politicians are seriously considering taking action in this direction. For the concern is well justified that environmentally harmful industries would emigrate from countries with environmental taxes and then perhaps produce in a much more environmentally harmful way. Then neither job preservation nor environmental protection would be served.

It is important that some leading economic nations implement an effective model of an eco-social market economy. As can be seen in North America or in Switzerland, the trend towards internationalisation then arises all by itself—especially in emissions trading. Like the stock exchanges, this model has an inherent dynamic towards globalisation. A tonne of carbon dioxide in Africa is no less harmful to the climate than a tonne of carbon dioxide in Europe. Globalised markets also need globalised environmental prices. There is only one planet Earth.

Ideally, sooner or later, an eco-social framework for world markets will be agreed on. On the revenue side, this would not be difficult. The pitfall would be located on the expenditure side: To whom is the money for the certificates allocated? Who decides what it is spent on? Ideally, it would have to be distributed per capita of the world's population—the equity principle and the demand for climate justice require this—which would amount to considerable financial transfer from rich to poor countries. Such per-capita distribution would by no means exclude tying the money to ecological or climate protection measures. The question, however, is what can be done to ensure that the money does not fall into the hands of corrupt "elites" in poor countries, but actually benefits such measures.

Another important aspect is added: to protect biodiversity, not only should harmful measures be taxed, but also beneficial ones should be paid for. The farmer who leaves a hedge between his fields, in which birds and small animals find shelter, cannot possibly do this for free. By maintaining the hedge, he is providing a service in the public interest. Now, there are already EU programmes that more or less adequately remunerate such services. But on the one hand, they do not cover everything that agriculture and forestry do to promote biodiversity. And they are also only related to the EU's internal market.

Moreover, if the international community expects very high ecosystem services from some states, e.g. through the protection of the rainforests, then it will have to ask itself, in terms of global justice, how it can financially compensate the landowners for this. The clearing of the rainforests

and the use of the land for livestock farming, palm oil plantations or the exploitation of mineral resources is financially more lucrative than their preservation—and as long as this remains the case, the clearing will continue. We should therefore think about an international fund into which all countries pay according to their economic strength, and which can then pay for globally relevant and above-average ecosystem services.

In 2006, Ecuador offered to leave its oil reserves in the ground in order to preserve the overlying rainforest in the Yasuní National Park. In return, President Rafael Correa wanted the rich countries of the world to pay around 3.6 billion dollars into a fund as compensation for the lost income. Although many countries thought this was a good idea, not even one per cent of the sum was collected. In autumn 2016, Ecuador started drilling for oil in Yasuní National Park.

8.4 (Post-)Growth?

As early as 2011, the WBGU found that the majority of Germans share opinions that are critical of growth. This majority wants a "new economic order" (WBGU 2011, 72). The WBGU assesses this as follows: "The currently reignited debate on alternatives to gross domestic product (GDP) as a welfare indicator can also be seen as an expression of the change in values described." (WBGU 2011, 79) At least in this the WBGU may see itself confirmed as the debates about economic growth remained a faithful and constant accompaniment in the decade following its 2011 report. A response to them must therefore be found.

As a moral theologian, I have very limited competence in answering the question of economic growth. Nevertheless, if ethics wants to be relevant, it must at least mark orientation points and boundary lines for a discourse that, as such, needs a high degree of interdisciplinarity. This is what I will do in the following section.

Historically, it is undoubtedly true that the World Council of Churches withdrew from the social sustainability discourses because of the growth orientation of the Rio Agenda 21 (Markus Vogt 2009, 162, citing John B. Cobb 2005, 1613). Apparently, the growth orientation of the UN programmes seemed to the WCC to imply the dominance of the economic pillar over the other two pillars of sustainability, which it did not want to support under any circumstances. And indeed, it is a "growth drug" (Markus Vogt 2009, 161), which has "typical characteristics of an addiction" (Markus Vogt 2009, 163, quoting Hubert Markl 1992). Supposedly,

economic growth provides meaning and orientation and becomes a value in itself.

In the current environmental debates, there are four proposals for dealing with the growth issue:

- Unconditional affirmation: Growth, no matter how high, is to be striven for because it makes (sustainable) development possible in the first place. Growth should therefore be sustainable above all (Brundtland Report, UNCED Agenda 21, etc.).
- Conditional affirmation: Growth must be narrowly limited but should remain greater than zero. The question is not whether, but how much growth we need (Hans-Christoph Binswanger et al. 1979 and 1983).
- Minus growth (degrowth): In industrialised countries, growth must be reversed to become minus growth because resource consumption must be curbed (degrowth movement; cf. Helmut Haberl et al. 2011, 11).
- Post-growth: Growth must be abandoned as the central indicator of progress and well-being as well as the central driver of the economy. A growth-oriented global economy should then be replaced by a subsistence-oriented economy with regional currencies (Niko Paech 2008).

First of all, there is a broad consensus that growth is unsuitable as an indicator of well-being. Differences only arise with regard to the second role of growth: While the first three proposals ascribe importance to growth as a driver of the economy in the future and only argue about how much and which growth makes sense, the last model attacks growth more fundamentally: Here, growth is also rejected as a driver of and control variable for the economy. In order to achieve some clarification from an ethical perspective, I will briefly discuss both aspects—growth as an indicator of prosperity and growth as an immanent driver of the subsystem economy.

Growth as an *indicator of prosperity* is definitely unsuitable and should be abolished. It is (described in psychological and medical terms) a drug and (described in theological ethical terms) an idol. Idols are supposed gods who put themselves in the position of power of God by inventing facts. Unlike the true God, they do not build up or protect, but destroy. They derive their power from the fact that they are not recognised as idols and are therefore "worshipped" as God by almost everyone. Growth is such an idol because it claims absolute dominance, although it "only" relates to a subsystem of society, namely the economy. Important as it may be, it is neither everything nor the most important thing.

The question is therefore: How can we measure well-being better? After all, a government must aim to shape society in such a way that as much well-being as possible is possible, and this must be measured. Of the many

proposals currently in circulation, I would like to briefly present four of the most prominent:

- Index of Sustainable Economic Welfare (ISEW): This index was developed in 1989 by the World Bank's chief economist Herman E. Daly, who has already been mentioned several times, and the theologian John B. Cobb. It takes into account factors such as income distribution, unpaid domestic work, public spending on healthcare, education, environmental pollution, resource consumption and the costs of global warming. In other words, the three "pillars of sustainability" were mapped out in it even before they were established. Put simply, the index, in economically very orthodox terms, creates an addition or subtraction of the various capitals (natural, physical, human and social capital). One result is that the ISEW of the USA has stagnated since the 1970s, even though the economy has grown considerably. In other words, the growth of the economy has come entirely at the expense of shrinking social and ecological capital. This cannot be called progress.
- Human Development Index (HDI) of the United Nations: This index, which has been compiled since 1990, combines three indicators in a relatively simple way: per capita income as an indicator of standard of living, life expectancy as an indicator of health and the average number of years of schooling as an indicator of education. As its name suggests, it is a development index, not a true well-being index as it is often considered. As such, it should not be over-interpreted.
- Better Life Index (BLI) of the OECD: Surprisingly, the economic organisation OECD developed an alternative indicator in 2011 to measure the well-being of people in member states. In its calculation, it includes objective factors such as income, health and the situation of the environment as well as relational (equality/ inequality) and subjective (life satisfaction) ones. The OECD is thus also aware that economic indicators alone are not meaningful, but that more comprehensive consideration must take place, which equally covers the three "pillars" of sustainability.
- Happy Planet Index (HPI): This index was developed in 2006 by the British think tank "New Economics Foundation" and the environmental organisation Friends of the Earth Great Britain. It is supported by many environmental and development cooperation organisations worldwide. The HPI divides the product of people's subjectively perceived well-being (according to the Gallup World Poll), objective life expectancy (according to UN data) and equality for all social groups by their ecological footprint (of the Global Footprint Network). Strictly

speaking, then, it is not an indicator of well-being, but of the efficiency of extracting as much personal well-being as possible from a limited use of nature. That is why the top ten in its annual rankings are consistently countries with moderate incomes. Costa Rica tops the list, but right behind it are Mexico and Colombia, two countries with high levels of corruption and crime that are hardly suitable as political model states. One has to ask whether measuring well-being with a subjective indicator alone is really meaningful. The ISEW and the BLI take a more solid, more broadly based approach here.

The four indicators mentioned above prove that an intensive debate has been launched in the decades since the Brundtland Report. It still lacks a convincing final result, but it shows promising intermediate results. Economic growth has definitely had its day as an indicator of comprehensive well-being.

But what about economic growth as an *immanent driver of the subsystem economy*? The models of eco-social structural change presented in chapter 8.2 adhere to growth as a fundamental driver immanent to the economy, albeit in a considerably modified form. Is this really "a utopia" (Niko Paech 2009b)? And, if so, what alternatively drives and steers the economy?

In classical economics, the need for economic growth is justified in this way: Through technical progress and human creativity, there are permanent increases in efficiency: a worker can produce more in the same time next year than this year. Productivity increases. At the same time, consumers can consume more next year for the same money than they can now. Their purchasing power has increased. So, there will be something left on the consumers' account next year if they consume exactly the same as this year. They can afford additional goods. At the same time, workers can produce more with the same working hours. The economy grows. But why do we need efficiency gains? Well, the competition never sleeps. Those who do not innovate and increase efficiency will sooner or later be squeezed out of the market.

In this model, negative growth can have two causes: Either there is a decline in intellectual capacity (because, for example, well-educated workers retire and less qualified ones move up), so that efficiency unintentionally declines or stagnates. Or, and this scenario is often overlooked, a society voluntarily decides to work less and consume less. In this second case, there would be a non-monetary efficiency driver that replaces economic growth in this role, namely the desire for more leisure time. Indeed, the interchangeability of time and money, expressed in the saying "time is money", only exists in the case of paid work time. The monetary value of

leisure time is not taken into account in gross domestic product, whose growth we measure. In this scenario, we would be dealing with an increase in efficiency that would not be monetarily motivated, but would achieve its economic goal of remaining competitive.

The growth model as an immanent driver of the subsystem economy has, of course, further weaknesses: Intrinsically, economic growth is designed to shrink towards zero. Even a constant absolute increase in productivity means an ever smaller relative percentage of economic growth. This can be well demonstrated empirically with a single glance at the growth rates in the major industrialised countries since World War II. The high growth rates of the “economic miracle years” will never be attainable again. Nevertheless, many countries have high employment rates and solid job creation. Growth does not seem to be as decisive for productivity as previously assumed.

From an ecological point of view, it must also be considered if environmental protection is (only) made with the profits of the economy, the environment is subordinate and environmental protection is post-cautionary, not precautionary (Markus Vogt 2009, 163). Conversely, in the current model of the market economy, only post-cautionary (technical, efficiency-oriented) environmental protection opens up opportunities for growth—precautionary (sufficiency-oriented) environmental protection reduces growth (Markus Vogt 2009, 162). Ecology and growth stand as mutual obstacles in each other's way—at least in advance of the structural changes proposed above. If economic growth is to have a future as a driver, it must therefore move away from a material orientation towards an orientation towards services and spiritual values—also in poorer countries (Markus Vogt 2009, 163). The structural change models presented in chapter 8.2 ultimately go precisely towards quantifying environmental goods in monetary terms. This allows the economy to grow if it maintains and promotes these goods and to shrink if it does not. GDP as a measure of growth would thus become environmentally sensitive. Reconceptualised in this way, it could retain some significance in the future.

In the previous chapter, we characterised ecological conversion as a turnaround in both individual behaviour and the “structures of sin” that govern it. Without fundamental structural changes in the field of the economy, the process of greening remains stuck in the first steps. But it does not have to be this way. The day may come when the “money value of creation” (Michael Schramm 1995) speaks the “ecological truth”. Until then, however, there are still many obstacles to be cleared out of the way.

9. Living well instead of having much. Virtues of Creation Spirituality

If structural reforms towards an eco-social market economy are not accompanied by a change in intrinsic attitudes, people will sooner or later rebel against them. Extrinsic motivations such as saving money through environmentally friendly behaviour must be filled by intrinsic motivations such as loving and being fascinated by Creation. Just as intrinsic motivation becomes frustrated when extrinsic incentives oppose it, extrinsic motivation will become hollow and empty in the long run if it is not nourished by the joy that comes from the depth of the heart.

That is why we are now dealing with the question of ethically good attitudes, classically called virtues, in dealing with planet Earth. Such virtues point to the possibilities of the people and bring their hidden potential to light. They motivate and inspire because they set processes of reflection and consideration free and encourage the transgression of previous personal standards in the direction of something even better. This motivational and inspirational potential of virtues has a lot to do with their pictorial character. Virtues can be understood and perceived as images of attitudes. Images are multi-layered, emotionally appealing and convey a much denser level of information than sentences (Michael Rosenberger 2018, 188).

In this sense, I will describe eight basic spiritual attitudes in the following, which are interconnected in a multi-layered way, but which I particularly relate to each other in pairs by relating them to the same basic human aspiration (cf. also Michael Rosenberger 2021, 129–151). All eight basic attitudes have a long ethical and spiritual tradition. Nevertheless, they could be joined by many more virtues. There is no conclusive catalogue of virtues. The number eight is therefore no more than an attempt to find a middle ground between confusing plurality on the one hand and simplistic one-sidedness on the other.

Most of the virtues explicated below also play a (varying) role in the encyclical *Laudato si'*. I will therefore refer to the relevant passages and analyse them in more detail where they are particularly substantial. In this way, Pope Francis' virtue ethical preferences can be more clearly identified and elaborated.

9.1 Gratitude as appreciation of the given

Gratitude (one could also say: contentment) is the momentary and lasting recognition and appreciation of what one has undeservedly received, that is, what one has been given. Or, as Pope Francis puts it: "Gratitude and gratuitousness (*gratitud y gratuidad*), that is, a recognition (*reconocimiento*) of the world as God's loving gift." (LS 220; cf. also LS 214; 222; 227). In order for gratitude to arise, it first needs thoughtfulness (in the literal sense of reflection) and a vivid memory of what has been received. Without memory, gratitude cannot grow. Out of attentive memory, gratitude affirms what has been given as a part of one's own overall good reality of life. It is the golden mean between permanent hardship that is convinced of constantly coming up short in life and naïve whitewashing that fades out the dark moments of one's own life and does not deal with them.

The *orientation* of gratitude is outward because it is the spiritual answer to the question: What do I receive? And from where do I receive it? In doing so, gratitude knows how to appreciate not only the superficially good, but also the heavy and dark. In retrospect, after sometimes very painful inner processes, it can be gratefully accepted because it has allowed one's own personality to mature and grow and because it has become an indispensable part of one's life. Gratitude is the other side of *humility*: while humility looks inwards at one's own neediness, gratitude looks outwards and discovers the richness of what has been received.

Together with humility, gratitude interprets and shapes above all the *human striving for prestige*. The grateful person recognises that they receive undeservedly without having given beforehand. They do not have the power to acquire or "make" everything through their own efforts. The grateful person admits the fundamental limitation of their own power and at the same time recognises the power of the giving authority, regardless of whether they call it "fate", "life", "nature" or even "God", and regardless of whether they think specifically of their own parents, from whom they received much undeservedly, of the animals or plants that give them nourishment, of "mother" earth, which supports all living beings, or of something else.

At present, the attitude of gratitude is receiving more attention in psychology than in theology and ethics. In the process, astonishing aspects are being brought to light: for example, gratitude (*gratitud*) strengthens one's own efforts to assist another, even if this "costs" a lot (*gratuidad*), not only towards a former benefactor, but even towards a stranger (Monica Y. Bartlett/David DeSteno 2006, 319–325; see also Jo-Ann Tsang 2006,

138–148). The reason for this stronger prosocial behaviour is to feel more valued (Adam M. Grant/ Francesca Gino 2010, 946–955).

Gratitude not only has positive effects on others, but also on the grateful person themselves: For example, someone who writes down what they are grateful for in a diary every week achieves self-imposed goals more often, is healthier and is more satisfied with their life. Those who practise a daily gratitude exercise are more attentive and energetic. This also applies to people suffering from a serious chronic illness (Robert A. Emmons/Michael E. McCullough 2003). In this respect, gratitude leads to more "wisdom" in the sense of life skills in all the ups and downs of life (Susanne König/Judith Glück 2013, 655–666). It is a stronger predictor of personal well-being than the so-called "Big Five" of personality psychology (OCEAN: Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism; cf. Alex M. Wood et al. 2008, 49–54 and 2009, 655–660).

However, gratitude is not simply a given character trait, as can also be shown empirically, but can actually be strengthened by one's own life practice, as Aristotle claims of the virtues. People who practise a religion or spirituality, i.e. attend religious services, read religious scriptures, pray and meditate, and feel tangibly connected to God or the Divine, are significantly more likely to be grateful than people who do not practise a religion or spirituality (Michael E. McCullough et al. 2002, 112–127). Gratitude plays a key role in all major religions. In Christianity, it finds a particularly striking form of expression in the Eucharist, literally translated as thanksgiving.

9.2 *Humility as becoming free through limitations*

Humility (humildad: LS 89; 224; 242) is the free and affirmative recognition of one's own limitations and dependence, fragility and mortality as a good existential destiny of being a creature—despite all its remaining questionability. Thus, humility initially means a sober and realistic self-assessment. However, it is by no means resigned, but senses and recognises the positive side of the limitedness of all earthly reality: only what is limited has value—what is unlimitedly available, according to the basic insight of economics, is worthless. This applies in particular to the most precious, because it is the scarcest, resource of earthly life: time. At the same time, its limitation relieves every creature: we do not need to be able to do everything, achieve everything, work endlessly. We can free ourselves from the pressure to take responsibility for everything and anything.

Humility, in Latin *humilitas*, is derived from *humus*, earth. Humility therefore means being close to the earth, staying on the ground, standing with both feet on the ground. Humility knows that, as a creature, man is taken from the earth, nourishes himself from the earth and its gifts and returns to the earth in the end (Gen. 3:19)—and that is good! In this sense, humility is the golden mean between arrogance and inferiority.

In Greek philosophy, humility was frowned upon—it is a specific legacy of the Judeo-Christian tradition. However, it was and is often misunderstood and misused, for it by no means signifies uncritical submissiveness or the renunciation of one's own opinion. Humility means standing on the ground, but not crawling to the ground. In this respect, the Christian Churches have taken much blame and misused the call for humility as an instrument of power.

The *gaze* of humility does not turn towards the authorities, but inwards, for it brings the realisation: "What do you have that you have not received? But if you have received it, why do you boast as if you had not received it?" (1 Cor. 4:7) In the early Church, many theologians referred to humility as true self-knowledge (e.g. Aurelius Augustine, *In Iohannis Evangelium tractatus* 25:16). But it is precisely in the sober acceptance of one's own limitations and frailties that the perception of their value lies: scarce goods are valuable, and all the more valuable the scarcer they are. Humility is thus the other side of *gratitude*—only the humble and earthbound can be grateful.

Together with gratitude, the virtue of humility interprets and shapes above all the human *striving for prestige and standing*. A humble person recognises their own powerlessness, even impotence, but experiences it as liberating. In order to live well, one does not need to seize power by force or chase it with all one's might. The humble person has understood that they are allowed to be weak and limited and that therein lies an opportunity for a greater richness of life.

9.3 Reverence as stepping back from the mystery

Reverence or esteem, attentiveness, respect (*respeto*: LS 5–6; 71; 85; 130; 157; 201; 207; 213) constitute the reverent amazement and shy withdrawal before another creature, whose unfathomable and unavailable secret one suspects, but leaves alone and appreciates in its inviolability. Reverence means renouncing the complete appropriation and complete possession of a fellow creature. It leaves room for the other being to unfold and realise

itself. Knowing its sensitivity and fragility, reverence strives to "handle the other being with kid gloves" and to treat even the seemingly most insignificant being like a precious treasure. Thus, reverence is the golden mean between aloofness, the striving for too much distance, and encroachment, the striving for too much closeness.

The *gaze* of reverence turns outwards, looks at the greatness and inscrutability of the You. Turned inwards, it corresponds to the *capacity for enjoyment*, which experiences the fascination and richness of the other as a value and absorbs it as enrichment of one's own identity. Those who have learned to enjoy become more reverent through every experience and every encounter. A reverent person recognises the preciousness of a being in itself; the person who is able to enjoy perceives this preciousness for itself and absorbs it.

The *form of action* of reverence consists rather in passively letting something be. Primarily, the concept of reverence addresses that which one refrains from out of a healthy and realistic "fear"—namely, hurting or destroying the You. Reverence is thus the passive counterpart of the virtue of *justice*, which actively works for the well-being of others and strives to give each their own. Only those for whom one has respect will be treated justly. But just treatment demonstrates respect for those treated in this way.

Together with justice, reverence interprets and shapes above all the *striving for localisation and belonging*: in respect, the You is ascribed a fundamental autonomy and self-legality that functions as the ground of equality and togetherness. The autonomous I expresses its respect for the autonomous You—both meet each other at eye level and are connected to each other.

Reverence is a central attitude in all religions. It is symbolically practised in worship and spiritual practices. The Rule of Benedict ties in with this attitude when it instructs the economist of a monastery: "He shall consider all the utensils and goods of the monastery as sacred altar vessels. Nothing shall he consider indifferent." (RB 31; cf. chapter 4.1). This encompasses all implements and goods—that is, the soil and the plough, the ox and the hen, clothes and books. In everything, the spiritual man can sense the mystery he is on the trail of in his life.

9.4 Justice as impartial engagement

Justice (*justicia*; LS 10; 49; 70–71; 82; 92; 159; 200; 207; 242) is the firm and constant endeavour to give to each his own and, conversely, to demand from each his own (Plato, *Politeia* IV 433e and 433a). Just action aims at giving no one too much, but also no one too little, and at taking from no one too little, but also from no one too much. The giving should correspond to the other's needs, the receiving to their abilities and possibilities.

The *perspective* of justice turns outwards and looks at the (exchange) relationships between individuals and institutions. It attempts to achieve an appropriate balance in the interplay between the common good and the individual good in each case of conflict. Justice is therefore the twin sister of inward-looking *moderation*, which for its part strives to keep the needs of the actor within a responsible framework.

The *form of action* of justice consists of an active, often passionate commitment. Primarily, the concept of justice addresses impartial advocacy for the disadvantaged and forgotten. Justice is thus the active counterpart to *reverence*, which for its part consists primarily in passive renunciation of encroaching, usurping actions. Only those who are treated justly can feel respected. Unjust treatment always implies a lack of respect.

Together with reverence, justice interprets and shapes the human *striving for location and belonging*: just treatment implies the formal equality of all. But precisely because all are formally equal, they must not be treated equally in terms of content because of their differences. To give everyone the same and to demand the same from everyone would be highly unjust. The consequence of formal equality is to give everyone something different that corresponds to them.

Without question, justice is ascribed a central importance in secular as well as religious environmental discourses. In the sustainability discourse, it is expanded globally and intergenerationally, but remains anthropocentric. In the biblical tradition, on the basis of the Noahide covenant, it is additionally extended in a biocentric way from the outset and referred to as "everything that lives" (cf. chapter 6.2). The encyclical *Laudato si'* sometimes also speaks of fraternity (*fraternidad*: LS 70; 82) with all creatures. Compared to the title of the *Canticle of the Sun*, which prefixes the attribute "brother" or "sister" to every creature listed, the idea of fraternity, however, rarely occurs and does not gain any formative power overall. In his subsequent encyclical *Fratelli tutti* from 2020, Pope Francis tried to compensate for this shortcoming as early as in the title.

9.5 Moderation as harmony with Creation

Since ancient Greece, moderation has been the term used to describe the firm effort to bring the demands of one's own person (*ψυχή*) into harmony (*συμφωνία*, cf. Plato, *Politeia* IV 430e) with the demands of other human beings (*πόλις*) and non-human creatures (*κόσμος*). Moderation is thus motivated and justified by the coexistence of creatures and the sharing of resources on a finite planet. Where it succeeds, it leads to more than just passively letting others live, namely to wonderful sounding together, a magnificent symphony of all living beings, which is a tremendous plus compared to the sum of all individual voices. More than all other virtues, the concept of moderation immanently expresses that it aims at a middle way between character extremes. Moderation is the golden mean between greed on the one hand and excessive asceticism that is hostile to the body and lust on the other. In the encyclical *Laudato si'*, it is associated with sufficiency as "frugality" (*sobriedad*) (LS 11; 126; 193; 222–225). The frugal being recognises when "it is enough" (Latin *sufficit*).

Moderation *looks* inwards and examines one's own demands to see whether they represent real needs or only dispensable desires, and whether or how they can be reconciled with the needs of all others. In the tension between the common good and the individual good, it tries to achieve appropriate self-restraint for every case of conflict. Moderation is therefore the twin sister of *justice* directed outwards, which for its part strives to actively realise inter-individual balance where this is not given "by nature".

Together with the *capacity for enjoyment*, moderation interprets and shapes the *human striving for pleasure and well-being*: However, while moderation captures pleasure quantitatively and determines the healthy middle of its measure, the capacity for enjoyment aims at the qualitative side of pleasure, where there can never be too much, but only too little. The logic of the popular slogan "less is more" (LS 222–223) recurs to this connection: fewer goods consumed can produce more enjoyment because pleasure is not smothered in excess, but is encouraged to taste and savour ever more intensively.

Moderation includes, among other things, the ability to accept delaying wish fulfilment. This ability is the starting point for the empirical research of the so-called "marshmallow test". Above all, this is inseparably linked with the name of a developmental psychologist: Walter Mischel (1930 Vienna–2018 New York). Mischel calls this ability "self-control" and "willpower". These are very performance-oriented semantics that certainly need to be questioned from a spiritual perspective. Nonetheless, the find-

ings of Mischel's research and that of his many students, which began in the late 1960s and continues to the present, are highly relevant. This research follows the same individuals from early childhood to midlife and beyond and conducts psychological investigations (in the form of experiments and interviews) with them at regular intervals. The guiding question is which of the young child's abilities have statistically significant consequences for their later life.

The baseline test is as follows: A kindergarten child is led into a room where there is a table with a marshmallow on it. The experimenter explains to the child that he or she has two options: either he or she can eat the marshmallow immediately, or he or she can wait until the experimenter returns to the room. If the marshmallow is still on the table at that time, the child gets two or three extra marshmallows.

Ten years later, those children who were able to wait for the return of the experimenter are more able to concentrate, less prone to frustration, more self-confident, more intelligent and more successful at school. Twenty years later, they have achieved a higher level of education, have higher self-esteem, are more resilient in stressful situations, have more stable partnerships, are slimmer and use drugs less often (Ozlem Ayduk et al. 2000; Walter Mischel et al. 2011). They are also less likely to become physically or verbally aggressive and less likely to suffer from depression (Monica L. Rodriguez et al. 1989). An analogous study from New Zealand shows that "strong-willed" children are less likely to drop out of school later, earn more, save more and incur less debt. Women are less likely to become pregnant unintentionally and less likely to be single parents. Men are less likely to be addicted to gambling and to commit crimes (Terrie E. Moffitt et al. 2011).

But what facilitates a three- or four-year-old child to have self-control and willpower? Surprisingly, there is first of all a collective influencing factor: language. There are "futureless" languages, which allow the speaker to say what will happen in the present tense ("morgen regnet es"), and "future-related" languages, which definitely enable the speaker to say what will happen in the future tense ("tomorrow it will rain", "domani pioverà"). Futureless languages include German, Mandarin, Japanese and Finnish, while future-related languages include English, French, Italian and Greek. In the future-less languages, the future seems to be closer because it is spoken of in the present tense; in future-related languages, it seems to be further away. It follows, however, and this has been empirically proven, that people with a futureless mother tongue find it easier to exercise self-control and postpone the satisfaction of needs than people

with a future-oriented language (M. Keith Chen 2013). This is because subjectively they do not have to wait as long. This is true even if, for example, German- and Italian-speaking children in Merano/South Tyrol go to the same primary school (Matthias Sutter et al. 2015).

A second factor is of an individual nature, and it is unquestionably more significant ethically: early childhood experience in the first year of life has a great influence on the child's ability to set aside its own needs. A longer breastfeeding period and the newborn growing up with both parents, for example, have significantly positive effects. This is because the child feels that it can rely on the care of its parents and does not need to be afraid of falling short (Matthias Sutter et al. 2013). Reliable and close relationships in early childhood thus enable easier renunciation and greater moderation.

9.6 *Enjoyment as a taste for life*

Enjoyment (in LS 222–223 gozo, joy) means the willingness and constant effort to savour and internalise what is used, i.e. things "enjoyed" in all their richness. Enjoyment does not mean quantitatively maximised and economically optimised utilisation, but "feeling and tasting of things from within" ("el sentir y gustar de las cosas internamente", according to Ignatius of Loyola, Spiritual Exercises No. 2). The enjoyer is "capable of deep enjoyment free of the obsession with consumption... and the capacity to be happy with little" (LS 222). He or she is able to "learn familiarity with the simplest things and how to enjoy them" (LS 223). Those who can enjoy have a taste for life. The ability to enjoy is to a large extent a spiritual activity. The person who has the ability to enjoy tastes the finest spice in a dish, perceives the slightest smell in their surroundings, hears the softest sound in a concert, sees the many shades of a colour and feels even the gentlest touch of their skin. This is precisely what pleasure-seeking and pleasure-hostility, as the two poles whose golden mean is the capacity for pleasure, cannot do: both remain on the surface and are unable to delve into the depths of spiritual pleasure.

The *orientation* of the ability to enjoy turns inwards and tries to perceive momentary sensory impressions with the highest attention and the ability to differentiate, so that these can be stored in the memory as lasting images. The ability to enjoy senses the preciousness and value of individual perceptions and strives to keep them present. It is therefore the twin sister of outwardly directed *reverence*. One could also say: enjoyment is the inwardly directed reverence for things, the true internalisation of their

uniqueness. Genuine enjoyment brings about reverent awe of its own accord.

Together with *moderation*, the capacity for enjoyment interprets and shapes the human *striving for pleasure and well-being*; whereas moderation measures pleasure quantitatively and determines the healthy middle of this measuring, the capacity for enjoyment aims at the qualitative side of pleasure, at its constant deepening and intensification. People who are capable of enjoyment need increasingly fewer external stimuli to feel deep pleasure and are better able to retain it, even when the object of enjoyment has disappeared. All common forms of spirituality know exercises to train and increase the ability to enjoy.

9.7 Serenity as being free from oneself

Serenity (*serenidad*: LS 222; 226; cf. also chapter 10) is the ability to refrain from one's own needs and fears even in difficult situations and to maintain a confident and open basic attitude. Such serenity grows out of a basic trust in the goodness of life and out of the inner security of being supported and safe. Medieval (male) mysticism can be understood as a path to serenity. The Middle High German word "Ledigheit", from which the New High German "Gelassenheit" comes, still clearly shows the echoes of being single (unmarried, in modern German "ledig") in the sense of being free. A serene person is able to let go of themselves—their thoughts and feelings, fear and longing, needs and desires. But it is precisely in this way that they become open to happiness and fulfilment. This is exactly what Jesus' key ethical sentence is about: "Whoever wants to save his life will lose it, but whoever loses his life... will save it." (Mark 8:35)

The *direction of serenity's gaze* is inward. It seeks to free itself from inner fetters and constraints by activating all potential that can strengthen trust and confidence. Trust is the breeding ground of serenity. It is for good reason that Jesus motivates serenity in the Sermon on the Mount by referring to the paternal and maternal love of God, who will provide food (the father's task in the understanding of roles at that time) and clothing (the mother's task in the understanding of roles at that time) (Mt. 6:25–34). The inner orientation of serenity corresponds to the outer orientation of *devotion*: whoever can let go of themselves becomes able to devote themselves to others. And whoever gives themselves finds themselves. Serenity and devotion are two sides of the same ethical coin.

Together with devotion, serenity interprets and shapes the human *striving for security and safety*: every human being seeks security and needs it in order to be able to develop. But security cannot be made. It is given to us. It is precisely this paradox that is addressed by the words of Jesus quoted above. Whoever frantically seeks security, whoever wants to safeguard themselves through money, possessions or contracts, will not gain inner security in the end. In the end, one has to let oneself fall in order to be able to experience that one is caught and carried.

9.8 Devotion as the willingness to give oneself to others

Devotion (entrega: LS 211; 232), sometimes also called "generosity" (generosidad: LS 209; 220) or "generous devotion" (entrega generosa: LS 10; 165; 245) and discussed again in chapter 10, means the willingness to give oneself with one's energy, abilities, resources and time to others who need it. Only an inwardly strong person can give themselves. They develop the necessary serenity to refrain from their own needs and to perceive that the needs of others are greater and more urgent. Strong people give out of fellowship and connection with those in need—because they themselves have once received. Nevertheless, giving has its limits: It is not expedient to wear oneself out in commitment to others to such an extent that in the end one can no longer help. Genuine devotion in the sense of ethical virtue will think sustainably and divide one's own forces realistically. It is the golden mean between egoism that closes one's heart to the needs of others and the helper syndrome that over-exploits oneself and one's own strength and ultimately ends in burnout.

The *direction* of devotion is outward. It looks at the needs and fears of fellow human beings and fellow creatures, empathises with them (empathy) and is ready to help without excessive consideration for one's own needs. The external orientation of devotion corresponds to the internal orientation of serenity: it is devotion that protects the serene person from self-sufficient egocentrism and self-limited egoism.

Together with serenity, devotion interprets and shapes the human *striving for security and safety*: serenity does not make committed devotion superfluous, but makes it possible as a free gift that is not driven by inner compulsion. It is serenity that prevents the helper syndrome because it can also let go of the urge to help and critically examine it from a distance. In this way, a serene person can honestly and impartially assess where

their possibilities have been undercut and where their limits have been exceeded.

The central term of "Laudato si'" for devotion is "cuidado", care. It already appears in the title of the encyclical, which in the English translation is "on care for our common home". In total, the noun "cuidado", the adjective "cuidadoso" and the verb "cuidare" occur sixty times in *Laudato si'*. "Cuidado" has a wide range of meanings in Spanish. It means care and concern, but also caution, respect, esteem, as well as guarding and watching over (Latin *custodia*). In Spanish, "cuidado de la creación" (LS 14) is a *terminus technicus* corresponding to the Italian "custodia del creato" and the English "care for Creation". The German translation of *Laudato si'* has also recognised that it is a *terminus technicus*. It translates it as "Bewahrung der Schöpfung", literally "preservation of Creation", which is etymologically close to "cuidado", but in today's usage sounds very preservative and technical. The relational aspect that resonates in "cuidado" has become almost invisible in "preservation". At the same time, "cuidado" alludes to Gen. 2:15, that man should cultivate and tend the garden of Creation. Also, in comparison to the German term "Schöpfungsverantwortung", which sounds very rational, "cuidado" expresses more strongly the emotional side of the human relationship to Creation, the loving care.

In comparison to the active "cuidado", Francis only rarely uses the term "compassion" (*compasión*), which is popular in secular discourse, in both *Evangelii gaudium* and *Laudato si'*. At one point, the close connection between compassion and care, which Francis otherwise takes for granted, is highlighted. There, he speaks of "care based on compassion (*el cuidado basado en la compasión*)" (LS 210). In fact, Francis wants to evoke this compassion when he speaks in a leitmotif of Sister Earth crying out because of her mistreatment (LS 2; 53). However, he explicitly links this cry for *compasión* only in *Evangelii gaudium*: "In order to be able to advocate a lifestyle that excludes others, or to be able to be enthusiastic about this selfish ideal, globalisation of indifference (*una globalización de la indiferencia*) has developed. Almost without realising it, we have become incapable of feeling compassion (*incapaces de compadecernos*) towards the painful outcry of others, we no longer cry in the face of the drama of others, nor are we interested in caring for them (*cuidarlos*), as if all this were a remote responsibility that is none of our business. The culture of prosperity numbs us ... while all these lives suppressed for lack of opportunities seem to us like a mere spectacle that does not shake us in any way." (EG 54) These sentences sum up much of Francis' thinking: Consumerism numbs us and distances us from fellow human beings in

need and from the abused Creation; it makes us insensitive and indifferent by robbing us of the gaze of proximity, the gaze of those affected and involved. The virtue of devotion opposes this indifference and numbing.

9.9 *Epilogue: Living simply*

What is ultimately at stake in a virtue ethic linked to Creation is made clear by Francis in a passage from his Creation Encyclical that bears his very own signature more than almost any other. These are the passages in which he proposes a new lifestyle (LS 222–225). These sentences can rightly be considered a synthesis of this chapter (practically all eight virtues described occur in it), so I do not wish to comment on them further, but leave them in the original text:

"Christian spirituality proposes an alternative understanding of the quality of life, and encourages a prophetic and contemplative lifestyle, one capable of deep enjoyment free of the obsession with consumption. ... It is the conviction that 'less is more'. A constant flood of new consumer goods can baffle the heart and prevent us from cherishing each thing and each moment. To be serenely present to each reality, however small it may be, opens us to much greater horizons of understanding and personal fulfilment. Christian spirituality proposes growth marked by moderation and the capacity to be happy with little. It is a return to that simplicity which allows us to stop and appreciate the small things, to be grateful for the opportunities which life affords us, to be spiritually detached from what we possess, and not to succumb to sadness for what we lack. This implies avoiding the dynamic of dominion and the mere accumulation of pleasure." (LS 222)

"Such sobriety, when lived freely and consciously, is liberating. It is not a lesser life or one lived with less intensity. On the contrary, it is a way of living life to the full. In reality, those who enjoy more and live better each moment are those who have given up dipping here and there, always on the look-out for what they do not have. They experience what it means to appreciate each person and each thing, learning familiarity with the simplest things and how to enjoy them. So, they are able to shed unsatisfied needs, reducing their obsessiveness and weariness. Even living on little, they can live a lot, ... Happiness means knowing how to limit some needs which only diminish us, and being open to the many different possibilities which life can offer." (LS 223)

In a retreat house that I visited regularly years ago, the sentence "simply living" is written above the entrance door. One can understand this sentence in two ways: If you emphasise the first word "*simply*", which in German would be the first preference in contrast to English, it seems ascetic and admonishing. If, on the other hand, the second word "*living*" is emphasised, it appears inviting and attractive. Traditionally, the emphasis on the first word was mostly noticed when talking about the environmental crisis. It is time to discover that the emphasis should be on the second word: Living simply(er) works—and it does good.

10. Engaging serenely. The environmental movement between indifference and burnout

"Aufschrei der Jugend" (meaning 'The Outcry of Young People'; official English title "Generation Fridays for Future") was the title of a very touching and at the same time provocative film by filmmaker Kathrin Pitterling about young people from Fridays for Future, which was shown on Bavarian television at the beginning of February 2021. The author accompanied prominent and unknown people from the movement for almost a year at close quarters and shows how diverse, but also how exhausting the protest work of the young people was in this boom phase. Coping with the tremendously challenging work of preparing and carrying out their demonstrations and strikes took the young people to the limits of their strength to a large extent. If it hadn't been for the coronavirus pandemic slowing down their activities from the outside, the students would probably have had to drastically reduce them themselves.

As mentioned in the foreword of this book, I was able to accompany many young people from Fridays for Future Upper Austria during this peak phase of the movement. Kathrin Pitterling's film allows me to relive this time very accurately. For as early as spring 2019, I asked myself and the young people what sources of strength could help them to sustain their highly altruistic commitment in the long term—including the setbacks and disappointments about the fact that politicians patted them on the back in a benevolent manner but largely let their demands bounce off them.

The more radically one is committed to environmental protection, the more one needs supportive spirituality—but also the more many committed people develop it. This is the core thesis of the religious scholar Bron Taylor (2020, 95–136). With the help of many prominent examples from the Anglo-Saxon world, he proves that secular and traditional religious forms of spirituality are finding each other and enriching each other through the concern to save planet Earth. A new form of ecumenism is emerging that reaches far beyond religions. He calls the secular forms of spirituality "naturalistic" and the religious ones "animistic", although he himself knows that these terms are very striking and simplistic. He is more concerned with what these approaches have in common, which he describes with the title "dark green religion". "Dark green religion" for

him is not a newly constituted religious community, but a loose, diverse and yet enormously supportive ground that the various forms of ecological spiritualities share—whether they are affiliated with a classical religion or not. This spirituality is "dark green" for Taylor because, in contrast to the ecologically as well as spiritually superficial "light green religion", it represents both strong ecology (strong sustainability) and strong spirituality—and can be found in all religions and world views.

Therefore, this chapter asks what Christian spirituality can contribute to such a "dark green religion". Some of this has already been mentioned in chapters 3 to 5 and in chapter 9. However, there is one aspect I would like to elaborate on at this point and thus give an answer to the question posed by the example of Fridays for Future about "burnout prevention": Is there a third way beyond the dogged fighting of some environmentalists and the globalised indifference of the self-satisfied majority of society, which Pope Francis rightly denounces? One that fills us inwardly despite failures and hostility? One that perhaps even allows contentment to grow instead of diminishing it?

10.1 A new understanding of (God-)trust

In the tradition of Christian spirituality, the maxim has been valid from time immemorial that man should strive for excellence, even if he knows for certain that he will not achieve it through his own efforts. It is probably expressed most pointedly in a formulation by Ignatius of Loyola: "Trust in God as if the success of things depended entirely on you, not on God; yet make every effort as if you would do nothing and God alone would do everything."²¹ This formula was apparently so provocative that it was soon transformed into a softer, less pointed version (Karl-Heinz Crumbach 1969, 321–328, citing Hugo Rahner 1964, 230–232): "Trust in God as if you will do nothing, God alone will do everything; nevertheless, in doing so, apply all effort as if the success of things depended entirely on you, not on God."²²

21 In this wording in Gabriel Hevenesi 1705¹, 230–231: "Sic Deo fide, quasi rerum successus omnis a te, nihil a Deo penderet; ita tamen iis operam omnem admove, quasi tu nihil, Deus omnia solus sit facturus."

22 Thus, Gabriel Hevenesi 1714², 230–231: "Sic Deo fide, quasi tu nihil, Deus omnia solus sit facturus; ita tamen iis operam omnem admove, quasi rerum successus omnis a te, nihil a Deo penderet. "

10. *Engaging serenely. The environmental movement between indifference and burnout*

Karl-Heinz Crumbach notes that in the second version of the formula, both trust in God and human action are increased immeasurably because both are separated from each other. In this way, the formula is unrealistic and undialectical. In the original version, on the other hand, the indissoluble connection between trust in God and one's own commitment is postulated at least theoretically ("as if"), according to Crumbach with Hugo Rahner. The acting human being should trust in God in such a way that trust in their own actions becomes resoundingly effective; and should act in such a way that they are completely free from any compulsion to succeed.

Applied to environmental protection, this would mean that devoted, untiring commitment to environmental protection is an expression of trust in God. On the other hand, anyone who resignedly withdraws in the conviction that man can do nothing anyway is an unbeliever who does not trust God's work in man, for he represents paralysing fatalism. At the same time, however, the second half-sentence of Ignatius' formula makes it clear that a dogged and cramped commitment does not correspond to the Christian faith. Rather, it is important to feel the inner freedom and serenity that does not depend on the success of one's own actions. Only the theological presupposition of a difference between human action and divine grace gives people the freedom they need to really commit themselves with all their might. Maximum commitment to climate protection would therefore be the only correct option for action even if it were foreseeable that the 1.5 or 2 degree target set in Paris would be missed.

10.2 *Hope as letting something happen*

Is there hope? Can we hope? This question was raised by the environmental organisation Greenpeace through a symbolic representation on the occasion of the 16th Conference of the parties (COP-16) to the UN Climate Convention in Cancún in 2010. A life ring about 20 metres in diameter was placed on the ocean beach in Mexico. Next to it, people lying on the beach formed the word "HOPE" with a thick question mark behind it. "The earth is in the greatest danger—can we still hope?" was the urgent and at the same time anxious question from Greenpeace. The question was initially addressed to the delegates at the Conference of the Parties. Strictly speaking, however, it is a spiritual, even religious question. If at all, only religions or spirituality can give an adequate answer. But can they? Can they give courage to the environmentally committed? So far, the es-

tablished religions have hardly been seen in this role by the environmental movement and have hardly seen themselves in it either.

In the face of immense environmental destruction, we live in a "crisis of hope" (Timothy Robinson 2020, 1). Especially in the USA, the human sciences now speak extensively of "eco-anxiety", "climate anxiety" and "environmental anxiety". However, there is sufficient evidence that this is a global phenomenon (Timothy Robinson 2020, 2). The paradox is that while social and health sciences have long been working on this and looking for help, theology does not yet seem to feel addressed by the challenge. Yet it would be the first addressee where hope is concerned. Therefore, I would like to offer some initial thoughts here.

First of all, in the context of the environmental crisis, religions can reinforce their age-old message that the happiness of the world is not feasible, not producible. In this sense, Markus Vogt writes: "Crises become theologically significant when they destroy false hopes and designs for the future and force people to [...] turn their hope to God. [...] Especially in the sustainability discourse, a level of fears and hopes is addressed that cannot be adequately answered by eco-social and economic management programmes, but only by referring to a dimension that transcends human 'doing' and being able to dispose of things." (Markus Vogt 2009, 75)

Accepting this realisation requires a good deal of humility. Humility is the grateful affirmation of the fact that we, as creatures, are taken from the earth, feed on it and return to the earth at the end of life (cf. chapter 9.2). Humility is the realisation that life is precious precisely because it will break. Humility is the realisation that human abilities and possibilities are limited, but that their use is nevertheless meaningful. Humility therefore does not mean disregarding or even denying the human potential to influence the world's climate and biodiversity, but recognising the gift-like character of a good future (Markus Vogt 2009, 75). Humans cannot "make" the future, but only humbly receive it—if they have done everything they can.

Theology therefore does not have the task of discrediting man's efforts to preserve Creation as presumption and arrogance. Rather, its task should be, in appreciation of the admirable commitment of the environmental movement like Pope Francis, to keep the "horizon of hopes and ideas of meaning that point beyond what is humanly, socially and technically possible, open to what is unavailable" (Markus Vogt 2009, 478). Hoping means letting something happen when one's own possibilities reach their limits.

10.3 *Hope as refraining from success*

Now, in Judaism and Christianity in particular, there is a long tradition of looking first or exclusively at the object of hope, that is, what is hoped for. Judeo-Christian expectations of salvation in the context of a linearly progressive model of history (Timothy Robinson 2020, 5) have been handed down through Paul, Aurelius Augustine and Thomas Aquinas and have even rubbed off on secular visions of the future such as those of Karl Marx or Ernst Bloch as well as on modern theologies of hope such as those of Jürgen Moltmann. But as soon as expectations of the future come first, whether on this side or the other side, man-made or God-given (Timothy Robinson 2020, 6), thinking becomes caught in the paradigm of success: Either they come true, in which case they are "successful", or they do not come true, in which case it was all for nothing. Acting under this premise is heteronomous and dependent on success.

Such a hope, misunderstood as the sense of optimism for the future or consolation for the hereafter, is rightly rejected by ancient Greece. It is considered the last and worst vice from Pandora's jar (Hesiod, *Works and Days*, lines 47–105). In modern terms, it could be described with Michael Nelson's (2016) formulation as a pure placebo that pre-programs disappointment and encourages fatalistic passivity. Jonathan Franzen (2019) also considers it paternalistic because it obscures the truth and treats people like children to be put off. Moreover, such hope is ineffective because it has never achieved anything sustainable in the entire history of mankind. Finally, it does not open up any real prospects.

Modernity is characterised by the idea of success to an extent that probably no previous epoch has experienced. This has to do with the overwhelming dominance of economic thinking, but also with the exaggerated self-confidence that man has everything, and above all his personal happiness, in his own hands. This is precisely what Pope Francis means by the "technocratic paradigm" (LS 106–114). That failure under this paradigm leads to burnout is not surprising. In view of these developments, the Jewish philosopher Martin Buber coined the following sentence as early as 1951: "Success is not one of the names of God." (Eugene Kogon/Karl Thieme 1951, 195–196). Belief in God and the paradigm of success are mutually exclusive.

But what can take the place of thinking in terms of success? What understanding of hope would be immune to the justified criticism of result orientation? Mind you, every human being needs visions of the future that give direction to his or her actions. But he needs much more and, first

of all, inner independence from their arrival. Timothy Robinson therefore suggests "embracing hopelessness" as a virtue (!). "To embrace hopelessness ... means to accept that we are in the midst of an utterly disorienting, overwhelming, and intractable crisis and that the conditions that threaten life and well-being on Earth are going to get worse. To release a false sense of hope that things are going to get fixed—by political will, technology, or an 'Omni-God'—provides clarity and a more realistic set of expectations." (Timothy Robinson 2020, 7) Roy Scranton puts it even more provocatively when he argues that we must acknowledge the death of contemporary civilisation that has already occurred: "The greatest challenge we face is a philosophical one: understanding that this civilization is already dead." (Roy Scranton 2015, 23)

In an enlightened sense, then, hoping must mean desisting from any success—the success of human programmes and activities as well as the success of any divine intervention whatsoever. This is a theological necessity, not just a historical or pragmatic one! God cannot be pressed into a linear scheme of success—he is beyond the categories of success and failure. He is no good as a substitute for when humanity reaches the limits of its possibilities.

10.4 Hope as the certainty that something has meaning

But what does hoping mean then? Are we allowed to hope; indeed should we still hope at all? Or should we leave hope in Pandora's jar, as the ancient Greeks said? In a great way, this is discussed in an answer given by Václav Havel in 1987 to a question from journalist Karel Hvížďala: "Do you see a glimmer of hope anywhere in the eighties?" Václav Havel replies: "First of all, I suppose I should say that I understand hope, which I think about quite often (especially in particularly hopeless situations, such as prison), primarily, originally and mainly as a state of mind, not a state of the world. Hope is something we either have within us or we don't, it is a dimension of our soul and is not dependent in its essence on any observation of the world or assessment of situations. Hope is not prognostication. It is orientation of the spirit, orientation of the heart that transcends the immediate lived world and is anchored somewhere in the distance, beyond its borders. As a mere derivative of something local, of some movement in the world or its favourable signals, it simply does not seem explainable to me. So I sense its deepest roots somewhere in transcendence, just like the roots of human responsibility, without be-

ing able—unlike Christians, for example—to say anything more concrete about this transcendence. This conviction of mine—actually it is more than conviction, it is inner experience—is not changed by the degree to which this or that person admits or denies anchoring of his hope: the most convinced materialist and atheist can have more of this inner, genuine hope anchored in transcendence (in my—not their—opinion!) than ten metaphysicians put together. The measure of hope in this deep and strong sense is not the measure of our pleasure in the good run of things and our will to invest in enterprises that will visibly lead to early success, but rather the measure of our ability to strive for something because it is good, and not just because it is guaranteed to succeed. The less favourable the situation in which we prove our hope, the deeper that hope. Hope is not optimism. It is not the conviction that something will turn out well, but the certainty that something has meaning—regardless of how it turns out. So I think that the deepest and most important hope, the only one that is able to keep us on the surface despite everything, to keep us doing good deeds, and the only real source of the greatness of the human spirit and its endeavour, we take from 'elsewhere'. And it is this hope above all that gives us the strength to live and to try again and again, no matter how hopeless the external conditions may be. So, I had to say that first. And now to what you probably mainly wanted to hear, namely the 'state of the world' and the quantity and types of hopeful signs in it." (Václav Havel 1987, 219–221)

Hope is "the certainty that something has meaning—regardless of how it turns out". This certainty, according to Havel, grows from a deep inner source, which he describes as "transcendence", however one may imagine it. To hope, then, is to hold on to the conviction of the meaningfulness and goodness of one's own actions. This meaningfulness is far above the categories of success and failure. One's own actions are not understood as a means to the end of some success, but as a value in themselves. "A re-imagined hope [...] will see virtuous action on behalf of the Earth and its inhabitants as a good in itself rather than as a means to an end." (Timothy Robinson 2020, 9). Being convinced of the meaningfulness and goodness of one's own actions is the actual paradigm of spiritual thinking. Vaclav Havel came to this realisation during years of political imprisonment. Even two years after Mikhail Gorbachev took office and two years before the fall of the Iron Curtain, he does not speculate on the end of communism. Rather, he is sustained by a hope that is autonomous, independent of the outcome of certain events: deep inside he feels the certainty that what he does is right and that what he thinks is good. Even if his speech

and action had no effect, they would have meaning (cf. Jonathan Franzen 2019).

In an impressive way, Karl Rahner developed a theology of hope based on these considerations as early as 1967, i.e. in the midst of a global phase of highest euphoria and greatest optimism, which corrects our classical misunderstanding of hope as optimism for the future or consolation for the hereafter, inspired by the Augustinian interpretation of the Pauline Epistles. Rahner starts with what for him "heaven", redeemed reality, means. Heaven is the reception, the receiving of God by a human being, who completely lets go of themselves. This reception takes place in two dimensions: In faith, God is accepted as the final, abiding mystery that man will never see through. In love, God is accepted as love that turns to man without reason, incomprehensibly, purely as a gift.

However, this receiving of God in faith and love has a dynamic of "going from oneself", as Rahner says, insofar as what is unavailable is accepted and man, in this acceptance, acknowledges that he cannot have God at his disposal. This dynamic of "going from oneself" towards the unavailability of God is precisely what we call hope. Hope is the "radical engagement with the absolute unavailability" of God (Karl Rahner 1967, 570). It takes place in earthly life in encounters with that which is provisional or uncontrollable. Seen in this way, hope is the acceptance of life as a venture (German Wagnis) and its outcome as an inaccessible mystery.

10.5 Epilogue: Bound in the bag of life

Those who take their responsibility for Creation seriously do not get involved because they assume that their efforts will be successful. That would be naïve and would most likely end in deep frustration. Those who take their responsibility for Creation seriously are committed despite the realistic possibility that destruction will continue. This book has shown which steps have to be taken. It is about being able to stand up straight before oneself and before God.

Hope, then, is not directed towards the future, but towards the present; not towards tomorrow, but towards today; not towards later, but towards now: Now hopeful people sense that the hour has struck; today they are doing what they can; in the present they are taking a small, seemingly insignificant step instead of waiting for the opportunity to take the great leap that will not come for eternity. From such hope grows a power that can change the world.

10. Engaging serenely. The environmental movement between indifference and burnout

So, I conclude with the metaphor that serves as the leitmotif of this book. Man as the "image of God" (Gen. 1:26) is like a shepherd to whom God entrusts his flock in faithful hands. When he returns from his wanderings over the many pastures, he will have to give an account for each of the animals. For each, even the smallest, supposedly most useless creature of this earth is "bound up in the bag of life" (1 Sam. 25:29).

Bibliography

- Nicholas Agar 1995, Valuing Species and Valuing Individuals, in: *Environmental Ethics* 17, 397–416.
- Nicholas Agar 1997, Biocentrism and the Concept of Life, in: *Ethics* 108, 147–168.
- Günter Altner 1991, Naturvergessenheit. Grundlagen einer umfassenden Bioethik, Darmstadt.
- Carl Amery 1972, Das Ende der Vorsehung. Die gnadenlosen Folgen des Christentums, Reinbek.
- Christoph Ammann/ Birgit Christensen/ Lorenz Engi/ Margot Michel (eds.) 2015, Würde der Kreatur. Ethische und rechtliche Beiträge zu einem umstrittenen Konzept, Zürich.
- Svante August Arrhenius 1896, On the influence of carbonic acid in the air upon the temperature of the ground, in: *The London, Edinburgh and Dublin Philosophical Magazine and Journal of Science* 5, 237–276.
- Associazione Teologica Italiana 1992, La Creazione e l'Uomo, Padova.
- Associazione Teologica Italiana 1993, La Creazione. Oltre l'antropocentrismo? Padova.
- Robin Attfield 1995, *Environmental Philosophy*, Aldershot.
- Alfons Auer 1971¹, 1984², *Autonome Moral und christlicher Glaube*, Düsseldorf.
- Alfons Auer 1981, Der Mensch – „Partner“ der Natur? Wider theologische Überschwänglichkeit in der ökologischen Diskussion, in: Heribert Gauly/ Maria Schulte/ Hans Peter Balmer/ Siegfried Dangelmayr (eds.), *Im Gespräch: Der Mensch. Ein interdisziplinärer Dialog*, Düsseldorf, 65–78.
- Alfons Auer 1984, *Umweltethik. Ein theologischer Beitrag zur ökologischen Diskussion*, Düsseldorf.
- Australian Catholic Bishops Conference 2002, *A New Earth – The Environmental Challenge. Social Justice Statement for 2002*, Alexandria NSW.
- Ozlem Ayduk/ Rodolfo Mendoza-Denton/ Walter Mischel/ Geraldine Downey/ Philip K. Peake/ Monica L. Rodriguez 2000, Regulating the interpersonal self. Strategic self-regulation for coping with rejection sensitivity, in: *Journal of Personality and Social Psychology* 79, 776–792.
- Martin Balluch o.J., Tierethik im Christentum!?, in: www.martinballuch.com/tierethik-im-christentum/ (retrieved: 20.7.20).
- Philipp Balzer/ Klaus Peter Rippe/ Peter Schaber (eds.) 1998, *Menschenwürde vs. Würde der Kreatur*, Freiburg i.B./ München.
- Bryan Bannon 2013, From Intrinsic Value to Compassion. A Place-Based Ethic, in: *Environmental Ethics* 35, 259–278.

- Heike Baranzke 2015, „Würde der Kreatur“ revisited. Zur Frage nach dem Grund der kreatürlichen Würde und ihrem Verhältnis zur Menschenwürde im biotechnologischen Zeitalter, in: Christoph Ammann/ Birgit Christensen/ Lorenz Engli/ Margot Michel (eds.) 2015, *Würde der Kreatur. Ethische und rechtliche Beiträge zu einem umstrittenen Konzept*, Zürich, 29–63.
- Edward Barbier 1987, The concept of sustainable economic development, in: *Environmental Conservation* 14, 101–110.
- Scott Barrett 2007, *Why cooperate? The incentive to supply global public goods*, Oxford/ New York.
- Monica Y. Bartlett/ David DeSteno 2006, Gratitude and Prosocial Behavior. Helping When It Costs You, in: *Psychological Science* 17, 319–325.
- Adrián E. Beling/ Julien Vanhulst/ Federico Demaria/ Violeta Rabi/ Ana E. Carballo/ Jérôme Pelenc 2018, Discursive Synergies for a ‘Great Transformation’ Towards Sustainability. Pragmatic Contributions to a Necessary Dialogue Between Human Development, Degrowth, and Buen Vivir, in: *Ecological Economics* 144, 304–313.
- Jeremy Bentham 1828, *An Introduction to the Principles of Morals and Legislation*. A new edition, corrected by the author, London.
- Teresa Berger (ed.) 2019, *Full of Your Glory*. Liturgy, Cosmos, Creation, Collegeville MN.
- Teresa Berger 1985, Lex orandi – lex credendi – lex agendi. Auf dem Weg zu einer ökumenisch konsensfähigen Verhältnisbestimmung von Liturgie, Theologie und Ethik, in: *Archiv für Liturgiewissenschaft* 27, 425–432.
- Joseph Bernhart 1997³, *Heilige und Tiere, Weißenhorn*.
- Bertelsmann-Stiftung 2010, *Bürger wollen kein Wachstum um jeden Preis, Gütersloh*. https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Presse/imported/downloads/xcms_bst_dms_32005_32006_2.pdf (8.2.21).
- Carl Bezold 1883, *Die syrische Schatzhöhle Band 1*, Leipzig; <http://menadoc.bibliotek.uni-halle.de/ssg/content/titleinfo/481360> (Retrieved 9.9.20).
- Gustav Bickell 1866, *S. Ephraemi Syri Carmina Nisibena*, Leipzig.
- Adelheid Biesecker/ Uta von Winterfeld 2013, *Alte Rationalitätsmuster und neue Beharrlichkeiten. Impulse zu blinden Flecken der Transformationsdebatte*, in: *GAIA* 22, 160–165.
- Hans-Christoph Binswanger/ Werner Geissberger/ Theo Ginsburg 1979, *Wege aus der Wohlstandsfalle – der NAWU-Report. Strategien gegen Arbeitslosigkeit und Umweltzerstörung*, Frankfurt/Main.
- Hans-Christoph Binswanger/ Heinz Frisch/ Hans G. Nutzinger 1983, *Arbeit ohne Umweltzerstörung. Strategien einer neuen Wirtschaftspolitik*, Frankfurt/ Main.
- Charles Birch 1993, *Regaining Compassion. For Humanity and Nature*, Sydney.
- Dieter Birnbacher (ed.) 1980, *Ökologie und Ethik*, Stuttgart.
- Dieter Birnbacher 1988, *Verantwortung für zukünftige Generationen*, Stuttgart.
- Rob Boddice (ed.) 2011, *Anthropocentrism. Humans, Animals, Environments*, Leiden/ Boston.

- Alberto Bondolfi (ed.) 1994, *Mensch und Tier*, Fribourg.
- Susana Borràs 2016, New Transitions from Human Rights to the Environment to the Rights of Nature, in: *Transnational Environmental Law* 5, 113–143.
- Ulrich Brand/ Markus Wissen 2017, *Imperiale Lebensweise. Zur Ausbeutung von Mensch und Natur in Zeiten des globalen Kapitalismus*, München.
- Ulrich Brand/ Markus Wissen 2018, What Kind of Great Transformation? The Imperial Mode of Living as a Major Obstacle to Sustainability Politics, in: *GAIA* 27, 287–292.
- Andrew Brennan 1984, The Moral Standing of Natural Objects, in: *Environmental Ethics* 6, 35–56.
- Andrew Brennan 1988, *Thinking about Nature. An Investigation of Nature, Value and Ecology*, London.
- Wendy Broadgate/ Owen Gaffney/ Lisa Deutsch/ Cornelia Ludwig/ Will Steffen 2015, The Great Acceleration data (October 2014), in: International Geosphere-Biosphere Programme, <http://www.igbp.net/globalchange/greatacceleration.4.1b8ae20512db692f2a680001630.html> (Retrieved 2.9.20).
- Becky J. Brown/ Mark E. Hanson/ Diana M. Liverman/ Robert W. Merideth Jr. 1987, Global sustainability: toward definition, in: *Environmental Management* 11, 713–719.
- Michael Bruckner/ Angela Kallhoff 2018, Biozentrismus, in: Johann S. Ach/ Dagmar Borchers (eds.), *Handbuch Tierethik. Grundlagen – Kontexte – Perspektiven*, Stuttgart, 161–166.
- Walter Brueggemann 2011, *The practice of prophetic imagination: Preaching an emancipating word*, Minneapolis MN.
- Martin Buber 2020, Im Anfang, in: <https://www.martin-buber.com/zitate/die-schrift/im-anfang/> (Retrieved 9.9.20).
- Bund für Umwelt und Naturschutz in Deutschland BUND/ Bischöfliches Hilfswerk Misereor (eds.) 1996, *Zukunftsfähiges Deutschland. Ein Beitrag zu einer global nachhaltigen Entwicklung*, Basel/ Boston/ Berlin.
- Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit/ Bundesamt für Naturschutz (eds.) 2020, *Die Lage der Natur in Deutschland. Ergebnisse von EU-Vogelschutz- und FFH-Bericht*, Berlin/ Bonn.
- Nancho Ijin Butai 1999, Interview mit Arne Næss, <http://www.nancho.net/advisors/anaes.html> (Retrieved: 21.12.20).
- J. Baird Callicott 1984, Non-anthropocentric value theory and environmental ethics, in: *American Philosophical Quarterly* 21, 299–309.
- J. Baird Callicott 1992, Rolston (“Environmental Ethics”) on Intrinsic Value. A Deconstruction, in: *Environmental Ethics* 14, 129–144.
- J. Baird Callicott 2006, Conservation Values and Ethics, in: Martha J. Groom/ Gary K. Meffe/ C. Ronald Carroll (eds.), *Principles of Conservation Biology*, Sunderland MA, 111–135.

Bibliography

- J. Baird Callicott 2011, The worldview concept and Aldo Leopold's project of 'world view' remediation, in: *Journal for the Study of Religion, Nature and Culture* 5, 509–528.
- J. Baird Callicott 2012, *Thinking like a planet. The land ethic and the earth ethic*, New York.
- J. Baird Callicott 2017, How ecological collectivities are morally considerable, in: *The Oxford handbook of environmental ethics*, 113–124.
- Hans Carl von Carlowitz 2013, *Sylvicultura oeconomica oder Haußwirthliche Nachricht und Naturmäßige Anweisung zur wilden Baum-Zucht*, München (Reprint der Ausgabe Leipzig 1713, ed. Joachim Hamberger).
- Louis-Marie Chauvet 1995, *Symbol and Sacrament. Sacramental Reinterpretation of Christian Existence*, Collegeville MN.
- M. Keith Chen 2013, The Effect of Language on Economic Behavior. Evidence from Savings Rates, Health Behaviors, and Retirement Assets, in: *American Economic Review* 103, 690–731.
- Jim Cheney 1992, Intrinsic Value in Environmental Ethics. Beyond Subjectivism and Objectivism, in: *The Monist* 75, 227–235.
- Stephen R.L. Clark 1994, Global Religion, in: Robin Attfield/ Andrew Belsey (eds.), *Philosophy and the Natural Environment*, Cambridge, 113–128.
- John B. Cobb jr. 2005, Sustainability and the World Council of Churches, in: *The Encyclopedia of Religion and Nature* Bd. 2, 1612–1613.
- John B. Cobb jr./ Donald R. Griffin 1979, *Prozesstheologie. Eine einführende Darstellung*, Göttingen.
- Secretariat of the Convention on Biological Diversity 2020, *Global Biodiversity Outlook 5*, Montreal.
- Eileen Crist 2020, *Schöpfung ohne Krone. Warum wir uns zurückziehen müssen, um die Artenvielfalt zu bewahren*, München (English: 2019, *Abundant Earth. Toward an Ecological Civilization*, Chicago).
- Karl-Heinz Crumbach 1969, Ein ignatianisches Wort als Frage an unseren Glauben, in: *Geist und Leben* 42, 321–328.
- Paul J. Crutzen 2002, Geology of mankind, in: *Nature* 415, 23.
- Paul J. Crutzen 2019, *Das Anthropozän: Schlüsseltexte des Nobelpreisträgers für das neue Erdzeitalter*, München.
- Paul J. Crutzen/ Christian Schwägerl 2011, Living in the Anthropocene: Toward a New Global Ethos, in: https://e360.yale.edu/features/living_in_the_anthropocene_toward_a_new_global_ethos (Retrieved 2.9.20).
- Paul J. Crutzen/ Eugene F. Stoermer 2000, The "Anthropocene", in: *The International Geosphere-Biosphere Programme (IGBP) Global Change Newsletter* No. 41/ May 2000, 17–18.
- Lisa E. Dahill 2016, Rewilding Christian Spirituality. Outdoor Sacraments and the Life of the World, in: Lisa E. Dahill/ James B. Martin-Schramm (eds.), *Eco-Reformation. Grace and Hope for a Planet in Peril*, Eugene OR, 177–196.

- Lisa E. Dahill 2020, Eating and Being Eaten: Interspecies Vulnerability as Eucharist, in: *Religions* 11, 204; <https://doi.org/10.3390/rel11040204> (Retrieved 30.10.20).
- John Harkness Dales 1968, Pollution, property and prices. An essay in policy-making and economics, Toronto.
- Herman E. Daly 1991, Sustainable growth: A bad oxymoron, in: *Environmental Carcinogenesis Reviews* 8, 401–407.
- Herman E. Daly 1996, *Beyond growth: the economics of sustainable development*, Boston.
- Tonke Dennebaum 2010, Doxologie und Ethik der Schöpfung: zur Bedeutung liturgischer Vollzüge im Kontext einer ökologischen Ethik, in: *Una Sancta* 65, 84–104.
- Nicholas Denysenko 2019, A Spring of Blessing: Creation and Sanctification in Byzantine Liturgy and Piety, in: Teresa Berger (ed.), *Full of Your Glory. Liturgy, Cosmos, Creation*, Colleagueville MN, 285–306.
- Deutsche Bischofskonferenz Kommission VI 1998, *Handeln für die Zukunft der Schöpfung*.
- Deutscher Bundestag (ed.) 1998, *Abschlußbericht der Enquete-Kommission „Schutz des Menschen und der Umwelt – Ziele und Rahmenbedingungen einer nachhaltig zukunftsverträglichen Entwicklung“: Konzept Nachhaltigkeit – Vom Leitbild zur Umsetzung*, Bonn.
- Bill Devall/ George Sessions 1985, *Deep Ecology. Living as if Nature Mattered*, Salt Lake City UT.
- Hans Diefenbacher 2001, *Gerechtigkeit und Nachhaltigkeit. Zum Verhältnis von Ethik und Ökonomie*, Darmstadt.
- Hermann Diels/ Walther Kranz (eds.) 1972–1975, *Die Fragmente der Vorsokratiker: griechisch und deutsch*, Zürich [u.a.], 3 Bände.
- Jan Dietrich 2017, *Welterfahrung (AT)*, in: *Wissenschaftliches Bibellexikon* <https://www.bibelwissenschaft.de/stichwort/34744/> (Retrieved 9.9.20).
- Eric Dinerstein/ David Olson/ Anup Joshi/ Carly Vynne/ Neil D. Burgess/ Eric Wikramanayake/ Nathan Hahn/ Suzanne Palminteri/ Prashant Hedao/ Reed Noss/ Matt Hansen/ Harvey Locke/ Erle C Ellis/ Benjamin Jones/ Charles Victor Barber/ Randy Hayes/ Cyril Kormos/ Vance Martin/ Eileen Crist/ Wes Sechrest/ Lori Price/ Jonathan E. M. Baillie/ Don Weeden/ Kierán Suckling/ Crystal Davis/ Nigel Sizer/ Rebecca Moore/ David Thau/ Tanya Birch/ Peter Potapov/ Svetlana Turubanova/ Alexandra Tyukavina/ Nadia de Souza/ Lilian Pintea/ José C. Brito/ Othman A. Llewellyn/ Anthony G. Miller/ Annette Patzelt/ Shahina A. Ghazanfar/ Jonathan Timberlake/ Heinz Klöser/ Yara Shennan-Farpon/ Roeland Kindt/ Jens-Peter Barnekow Lillesø/ Paulo van Breugel/ Lars Gaudal/ Maianna Voge/ Khalaf F. Al-Shammari/ Muhammad Saleem 2017, An ecoregion-based approach to protecting half the terrestrial realm, in: *BioScience* 67, 534–545.

Bibliography

- Eric Dinerstein/ Carly Vynne/ Enric Sala/ Anup Joshi/ Senura Fernando/ Thomas Lovejoy/ Juan Sebastian Mayorga/ David Olson/ Gregory P. Asner/ Jonathan E.M. Baillie/ Neil D. Burgess/ Karl Burkart/ Reed Noss/ Ya Ping Zhang/ Alessandro Baccini/ Tanya Birch/ Nathan Hahn/ Lucas N. Joppa/ Eric Wikramanayake 2019, A global deal for nature: guiding principles, milestones, and targets, in: *Science Advances* 5, 1–17.
- Eugen Drewermann 1986, *Der tödliche Fortschritt. Von der Zerstörung der Erde und des Menschen im Erbe des Christentums*, Regensburg.
- Nigel Dudley/ Sue Stolton (eds.) 2008, *Defining Protected Areas. An international conference in Almeria, Spain, May 2007*, Gland.
- Peter Ebenbauer 2017, Segne, Vater, unsre Erde. Die Schöpfung als Gegenstand jüdischer und christlicher Segens-Praxis, in: *Heiliger Dienst* 71, 135–147.
- Helga Eblinghaus/ Armin Stickler 1996, *Nachhaltigkeit und Macht. Zur Kritik von Sustainable Development*, Frankfurt/ Main.
- Ottmar Edenhofer 2006, Eine Ethik der Nachhaltigkeit. Die deutschen Bischöfe zu den Gefahren des Klimawandels, in: *Stimmen der Zeit* 131, 742–756.
- Ottmar Edenhofer/ Christian Flachsland/ Jérôme Hilaire/ Michael Jakob 2016, Den Klimawandel stoppen. Es gibt nicht zu wenig, sondern zu viel fossile Ressourcen – sie müssen in der Erde bleiben, in: Markus Patenge/ Roman Beck/ Markus Lubert (eds.), *Schöpfung bewahren: Theologie und Kirche als Impulsgeber für eine nachhaltige Entwicklung*, Regensburg, 30–34.
- Robert Elliot 1994, Ecology and the Ethics of Environmental Restoration, in: Robin Attfield/ Andrew Belsey (eds.), *Philosophy and the Natural Environment*, Cambridge, 31–44.
- Robert A. Emmons/ Michael E. McCullough 2003, Highlights from the Research Project of Gratitude and Thankfulness (Paper), in: http://local.psy.miami.edu/faculty/mmccullough/Gratitude-Related%20Stuff/highlights_fall_2003.pdf (Retrieved 16.2.21).
- European Environmental Agency (EEA) 2020, *State of nature in the EU. Results from reporting under the nature directives 2013–2018*, Luxembourg.
- Heino Falcke 1989, Die theologischen Leitworte im konziliaren Prozeß: Umkehr, Schalom und Bund, in: *Diakonia* 20, 297–305.
- Frederick Ferré 1995, Value, Time and Nature, in: *Environmental Ethics* 17, 417–431.
- Georg Fischer 2018, *Genesis 1–11*, Freiburg i.B./ Basel/ Wien.
- Jürgen Flemming 1968, Baum, Bäume, in: *Lexikon der christlichen Ikonographie* 1, 258–268.
- Joseph Fourier 1824, *Mémoire sur les températures du globe terrestre et des espaces planétaires*, in: *Annales de Chimie et de Physique* XXVII, 136–167.
- Matthew Fox 1988, *The Coming of the Cosmic Christ. The Healing of Mother Earth and the Birth of a Global Renaissance*, San Francisco CA.
- Jonathan Franzen 2019, What if We Stopped Pretending?, in: *The New Yorker* 8.9.2019, <https://www.newyorker.com/culture/cultural-comment/what-if-we-stopped-pretending> (Retrieved 16.2.21).

- William C. French 1995, Against Biospherical Egalitarianism, in: *Environmental Ethics* 17, 39–58.
- Henrike Frey-Anthes 2010, Ziege / Ziegenbock, in: *Wissenschaftliches Bibellexikon* <https://www.bibelwissenschaft.de/stichwort/35346/> (Retrieved 9.9.20).
- Gary Gardner 2003, Die Einbeziehung der Religion in der Suche nach einer nachhaltigen Welt, in: *Worldwatch Institute* (ed.) 2003, *Zur Lage der Welt 2003*, Münster, 291–327.
- Joris Geldhof 2019, Fruit of the Earth, Work of Human Hands, Bread of Life. The Ordo Missae on Creation and the World, in: Teresa Berger (ed.), *Full of Your Glory. Liturgy, Cosmos, Creation*, Collegeville MN, 245–266.
- Joseph Gelineau 1968, La quatrième prière eucharistique, in: *Anaphores nouvelles – Assemblées du Seigneur NS 2*, 35–53.
- Hanna-Barbara Gerl-Falkovitz 1996, Das Glück der Grenze, in: Werner Bühler/ Hans G. Wirtz (eds.), *Leben in Grenzen. Zu einer Grunderfahrung des Menschen*, Weimar, 53–72.
- Dieter Gerten/ Vera Heck/ Jonas Jägermeyr/ Benjamin Leon Bodirsky/ Ingo Fetzer/ Mika Jalava/ Matti Kummu/ Wolfgang Lucht/ Johan Rockström/ Sibyll Schaphoff/ Hans Joachim Schellnhuber 2020, Feeding ten billion people is possible within four terrestrial planetary boundaries, in: *Nature Sustainability* DOI: 10.1038/s41893-019-0465-1.
- Hans Gleixner 1989, Überlegungen zu den unterschiedlichen Ansätzen christlicher Ökoethik, in: Philipp Schäfer (ed.), *Freiheit in Gemeinschaft*, Passau, 45–65.
- Joachim Gnilka 1978, *Das Evangelium nach Markus, Band I*, Zürich u.a.
- Joachim Gnilka 1979, *Das Evangelium nach Markus, Band II*, Zürich u.a.
- Maja Göpel/ Moritz Remig 2014, Vordenker einer nachhaltigen Gesellschaft. Karl Polanyi und die „Große Transformation“, in: *GAIA* 23, 70–72.
- Robert Goodland/ Herman Daly 1996, Environmental sustainability: universal and non-negotiable, in: *Ecological Applications* 6, 1002–1017.
- Martin Gorke 2010, *Eigenwert der Natur. Ethische Begründung und Konsequenzen*, Stuttgart.
- Roger S. Gottlieb 1999, The Transcendence of Justice and the Justice of Transcendence. Mysticism, Deep Ecology, and Political Life, in: *Journal of the American Academy of Religion* 67, 149–166.
- Erich Gräßer 1990, Das Seufzen der Kreatur (Röm 8,19-22), in: *Jahrbuch für Biblische Theologie* 5, 93–117.
- Adam M. Grant/ Francesca Gino 2010, A Little Thanks Goes a Long Way: Explaining Why Gratitude Expressions Motivate Prosocial Behavior, in: *Journal of Personality and Social Psychology* 98, 946–955.
- William Grey 1993, Anthropocentrism and Deep Ecology, in: *Australasian Journal of Philosophy* 71, 463–475.
- John Grin/ Jan Rotmans/ Johan Schot 2010, *Transitions to Sustainable Development. New Directions in the Study of Long Term Transformative Change*, London.

Bibliography

- Basilius J. Groen 2019, Große und Kleine Wasserweihe in der orthodoxen Tradition, in: *Heiliger Dienst* 73, 73–78.
- Bert Groen 2019, The First of September: Environmental Care and Creation Day, in: Teresa Berger (ed.), *Full of Your Glory. Liturgy, Cosmos, Creation*, Collegeville MN, 307–332.
- Martha J. Groom/ Gary K. Meffe/ C. Ronald Carroll (eds.) 2006³, *Principles of Conservation Biology*, Sunderland MA.
- Walter Gross 1995, Gottebenbildlichkeit. I. Altes Testament, in: *Lexikon für Theologie und Kirche* 4, 871–873.
- Lori Gruen 2015, *Entangled Empathy. An Alternative Ethic for Our Relationships with Animals*, New York.
- David Grumett 2019, The World as Christ's Body: Problems and Possibilities, in: Teresa Berger (ed.), *Full of Your Glory. Liturgy, Cosmos, Creation*, Collegeville MN, 233–244.
- Romano Guardini 1925, *Der Gegensatz. Versuche zu einer Philosophie des Lebendig-Konkreten*, Mainz.
- Diana Güntner 2009, Begegnen und feiern. Schöpfung in Liturgie und Meditation, in: Margit Eckholt/ Sabine Pemsel-Maier (eds.), *Unterwegs nach Eden: Zugänge zur Schöpfungsspiritualität*, Ostfildern, 195–205.
- Fritz Gusenleitner/ Martin Schwarz 2019, Das stille Sterben der Insekten, in: *ÖKO-L* 41/3-4, 32–38.
- Helmut Haber/ Marina Fischer-Kowalski/ Fridolin Krausmann/ Joan Martinez-Alier/ Verena Winiwarter 2011, A Socio-metabolic Transition towards Sustainability? Challenges for Another Great Transformation, in: *Sustainable Development* 19, 1–14.
- Matthew Hale 1676, *Contemplations Moral and Divine*, Band 1, London.
- Caspar A. Hallmann/ Martin Sorg/ Eelke Jongejans/ Henk Siepel/ Nick Hofland/ Heinz Schwan/ Werner Stenmans/ Andreas Müller/ Hubert Sumser/ Thomas Hören/ Dave Goulson/ Hans de Kroon 2017, More than 75 percent decline over 27 years in total flying insect biomass in protected areas, in: *PLOS ONE* 12, <https://doi.org/10.1371/journal.pone.0185809> (Retrieved 10.10.20).
- Garret Hardin 1968, The Tragedy of the Commons, in: *Science* 162, 1243–1248.
- Garrett Hardin/ Dudley Kirk 1980, *Tragedy of the commons*, Glendale CA.
- Eugene C. Hargrove 1992, Weak anthropocentric intrinsic value, in: *The Monist* 75, 183–207.
- Kyle Harper 2020, *Fatum. Das Klima und der Untergang des römischen Reichs*, München.
- Dorothea Haspelmath-Finatti (ed.) 2019, *Called to worship – freed to respond. Beiträge aus der internationalen Liturgischen Theologie zum Zusammenhang von Gottesdienst und Ethik*, Gütersloh.
- Volker Hauff 1987, *Unsere gemeinsame Zukunft. Der Brundtland-Bericht der Weltkommission für Umwelt und Entwicklung*, Grevén.

- Winfried Haunerland 2000, Brauchen wir ein neues Fest? Schöpfungsfrömmigkeit und Liturgie. Schöpfung und Geschöpflichkeit, in: Theologisch-praktische Quartalschrift 148, 251–261.
- Michael Hauskeller 2015, Was heißt, die Würde eines Tieres zu achten?, in: Christoph Ammann/ Birgit Christensen/ Lorenz Engi/ Margot Michel (eds.) 2015, Würde der Kreatur. Ethische und rechtliche Beiträge zu einem umstrittenen Konzept, Zürich, 142–157.
- Václav Havel 1987, Fernverhör. Ein Gespräch mit Karel Hvizďala, Reinbek bei Hamburg.
- Samuel P. Hays 1959, Conservation and the Gospel of Efficiency. The Progressive Conservation Movement, 1890–1920, Cambridge MS.
- Tim Hayward 1997, Anthropocentrism. A misunderstood problem, in: Environmental Values 6, 49–63.
- Marie-Louise Henry 1993, Das Tier im religiösen Bewußtsein des alttestamentlichen Menschen, in: Bernd Janowski/ Ute Neumann-Gorsolke/ Uwe Glessmer (eds.), Gefährten und Feinde des Menschen. Das Tier in der Lebenswelt des alten Israel, Neukirchen/Vluyn, 20–66.
- Peter Hersche 2020, (K)eine Frage von gestern, in: Herder-Korrespondenz 12/2020, 29–31.
- Peter Hersche 2020a, Max Weber, die Ökologie und der Katholizismus, Basel.
- Timothy Hessel-Robinson 2012, “The Fish of the Sea Perish”. Lamenting Ecological Ruin, in: Liturgy 27, 40–48.
- Gabriel Hevenesi ¹1705/ ²1714, Scintillae Ignatianae, Vienne.
- Karl-Heinz Hillmann 1981, Umweltkrise und Wertewandel. Die Umwertung der Werte als Strategie des Überlebens, Frankfurt/ Main.
- Hasso Hoffmann 1988, Person II. Rechtsphilosophisch, in: Staatslexikon 4, 336–339.
- Ronald Inglehart 1977, The Silent Revolution. Changing Values and Political Styles among Western Publics, Princeton NJ.
- Ronald Inglehart 1998, Modernisierung und Postmodernisierung. Kultureller, wirtschaftlicher und politischer Wandel in 43 Gesellschaften, Frankfurt am Main/ New York.
- Ronald Inglehart 2003, Human Values and Social Change. Findings from the Value Surveys, Leiden/ Boston.
- Ronald Inglehart 2008, Changing values among western publics from 1970 to 2006, in: West European Politics 31, 130–146.
- Ronald Inglehart/ Roberto Foa/ Christopher Peterson/ Christian Welzel 2008, Development, Freedom, and Rising Happiness. A Global Perspective (1981–2007), in: Perspectives on Psychological Science 2008, 264–285.
- Intergovernmental Panel on Climate Change (IPCC) 2001, Climate Change 2001. Synthesis Report. A Contribution of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change [Watson, R.T. and the Core Writing Team (eds.)], Cambridge, New York.

- Intergovernmental Panel on Climate Change (IPCC) 2007, Climate Change 2007. Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)], Geneva.
- Intergovernmental Panel on Climate Change (IPCC) 2018, Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, without indication of place.
- International Union for Conservation of Nature and Natural Resources (IUCN)/ United Nations Environment Programme (UNEP)/ World Wildlife Fund (WWF) 1980, World Conservation Strategy. Living Resource Conservation for Sustainable Development, without indication of place.
- Internationale Theologenkommission 2014, Sensus fidei im Leben der Kirche, Rom.
- Bernhard Irrgang 1986, Zur Problemgeschichte des Topos „christliche Anthropozentrik“ und seine Bedeutung für eine Umweltethik, in: Münchener Theologische Zeitschrift 37, 185–203.
- Bernhard Irrgang 1992, Christliche Umweltethik. Eine Einführung, München/ Basel.
- Bernhard Irrgang 1993, Anthropozentrik II. in: Lexikon für Theologie und Kirche 1, 743.
- Bernhard Irrgang / Ralf Bammerlin 1998, Biozentrik, in: Lexikon der Bioethik 1, 402–404.
- Kevin W. Irwin 2011, Toward a New Liturgical Movement, in: Origins 40/46, 745–759.
- Kevin W. Irwin 2019, Sacramental Theology after Laudato si’”, in: Teresa Berger (ed.), Full of Your Glory. Liturgy, Cosmos, Creation, Collegeville MN, 267–284.
- Bernd Janowski 1990, Tempel und Schöpfung, in: Jahrbuch für Biblische Theologie 5, 37–69.
- Bernd Janowski 1993, Auch die Tiere gehören zum Gottesbund, in: Bernd Janowski/ Ute Neumann-Gorsolke/ Uwe Glessmer (eds), Gefährten und Feinde des Menschen. Das Tier in der Lebenswelt des alten Israel, Neukirchen/ Vluyn, 1–14.
- Grace M. Jantzen 1984, God’s World, God’s Body, London.
- Peter Jeffery 2019, The Six Evenings of Creation in the Hymns of the Roman Breviary, in: Teresa Berger (ed), Full of Your Glory. Liturgy, Cosmos, Creation, Collegeville MN, 137–164.
- Joachim Jeremias 1990, Schöpfung in Poesie und Prosa des Alten Testaments, in: Jahrbuch für Biblische Theologie 5, 11–36.
- William Stanley Jevons 1865, The Coal Question. An Inquiry Concerning the Progress of the Nation, and the probable Exhaustion of Our Coal Mines, London/ Cambridge.

- Li-Qing Jiang/ Richard A. Feely/ Brendan R. Carter/ Dana J. Greeley/ Dwight K. Gledhill/ Krisa M. Arzayus 2015, Climatological distribution of aragonite saturation state in the global oceans, in: *Global Biogeochemical Cycles* 29, 1656–1673.
- Elizabeth Johnson 2018, *Creation and the Cross. The Mercy of God for a Planet in Peril*, Maryknoll NY.
- Hans Jonas 1973, *Organismus und Freiheit*, Göttingen.
- Karin Jürgens 2008, Emotionale Bindung, ethischer Wertbezug oder objektiver Nutzen? Die Mensch-Nutztier-Beziehung im Spiegel landwirtschaftlicher (Alltags-) Praxis, in: *Zeitschrift für Agrargeschichte und Agrarsoziologie* 56, 41–56.
- Angela Kallhoff 2014, Plants in Ethics: Why Flourishing Deserves Moral Respect, in: *Environmental Values* 23, 685–700.
- Angela Kallhoff 2007, Pflanzenethik: Ein Begründungsansatz, in: *Jahrbuch für Wissenschaft und Ethik* 12, 79–96.
- Angela Kallhoff 2002, *Prinzipien der Pflanzenethik. Die Bewertung pflanzlichen Lebens in Biologie und Philosophie*, Frankfurt a.M./ New York.
- Ulrich Kattmann 1997, Der Mensch in der Natur. Die Doppelrolle des Menschen als Schlüssel für Tier- und Umweltethik, in: *Ethik und Sozialwissenschaften* 8, 123–194.
- Otmar Keel/ Christoph Uehlinger 1992, *Göttinnen, Götter und Gottessymbole*, Freiburg i.B.
- Otmar Keel/ Silvia Schroer 2002, *Schöpfung. Biblische Theologien im Kontext altorientalischer Religionen*, Göttingen.
- John P. Keenan 2004, A Mahayana Theology of the Real Presence of Christ in the Eucharist, in: *Buddhist-Christian Studies* 24, 80–100.
- Scott M. Kershner 2017, Worship in the Wilderness: Experiments in Liturgy and Ecology, in: *Liturgy* 32, 40–46.
- Hans Kessler 1990, *Das Stöhnen der Natur. Plädoyer für eine Schöpfungsspiritualität und Schöpfungsethik*, Düsseldorf.
- Herbert Killian 1994, Das Prinzip der Nachhaltigkeit aus forsthistorischer Sicht, in: *Journal für Entwicklungspolitik* 10, 255–282.
- Ludwig Klages 1913, *Mensch und Erde*, Jena, in: <http://www.worldfuturefund.org/wffmaster/Reading/Germany/Menschunderde.htm> (Retrieved 20.2.21).
- Barendt J. de Klerk 2014, Enhancing ecological consciousness through liturgical acts of doxology and lament, in: *Verbum et Ecclesia* 35, Art. #859, 1–8.
- Daniela Kletzan-Slamani/ Angela Köppl 2016, Umweltschädliche Subventionen in den Bereichen Energie und Verkehr, in: *WIFO-Monatsberichte* 89, 605–615.
- Florian Kluger 2011, *Benediktionen. Studien zu kirchlichen Segensfeiern*, Regensburg.
- Kevin B. Knight/ Emily S. Seddon/ Theodore P. Toombs 2020, A framework for evaluating biodiversity mitigation metrics, in: *Ambio* 49, 1232–1240.
- Axel Ayyub Köhler 1996, *Schächten in Deutschland*, in: *CIBEDO (Christlich-Islamische Begegnungs- und Dokumentationsstelle)* 10, 145–146.

- Susanne König/ Judith Glück 2013, "Gratitude is with me all the time". How gratitude relates to wisdom, in: *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* 69, 655–666.
- Eugene Kogon/ Karl Thieme 1951, Das Porträt: Martin Buber, in: *Frankfurter Hefte. Zeitschrift für Kultur und Politik* 6/3, 195–199.
- Elizabeth Kolbert 2016, *Das 6. Sterben. Wie der Mensch Naturgeschichte schreibt*, Berlin.
- Helen Kopnina 2016, Half the earth for people (or more)? Addressing ethical questions in conservation, in: *Biological Conservation* 203, 176–185.
- Helen Kopnina 2019, Anthropocentrism and Post-humanism, in: *The International Encyclopedia of Anthropology*, <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118924396.wbiea2387> (Retrieved 24.9.20).
- Helen Kopnina/ Haydn Washington/ Bron Taylor/ John J. Piccolo 2018, Anthropocentrism. More than just a misunderstood problem, in: *Journal of Agricultural and Environmental Ethics* 31, 109–127.
- Wilhelm Korff 1995, Güter- und Übelabwägung. In: *Lexikon für Theologie und Kirche* 4, 1118–1120.
- Wilhelm Korff 1997, Schöpfungsgerechter Fortschritt. Grundlagen und Perspektiven der Umweltethik, in: *Herder Korrespondenz* 51, 78–84.
- Christine Korsgaard 2004, Fellow Creatures. Kantian Ethics and Our Duties to Animals, in: *The Tanner Lectures on Human Values* 25/26, 79–110.
- Angelika Krebs 1997, *Naturethik: Grundtexte der gegenwärtigen tier- und ökoethischen Diskussion*, Frankfurt/ Main.
- Udo Krolzik 1979, *Umweltkrise. Folge des Christentums?*, Stuttgart/ Berlin.
- Ethan Kross/ Walter Mischel/ Yuichi Shoda 2010, Enabling self-control. A cognitive affective processing system (CAPS) approach to problematic behavior, in: James E. Maddux/ June Tangney (eds.), *Social Psychological Foundations of Clinical Psychology*, New York, 375–394.
- Peter Kunzmann 2007, *Die Würde des Tieres – zwischen Leerformel und Prinzip*, Freiburg i.B./ München.
- Tabita Landová 2019, Liturgy and the Discerning Worldview: On the Relationship between Liturgy and Ethics, in: *Theologica* 9, 15–35.
- Aldo Leopold 1949, *A Sand County Almanac*, Oxford (deutsch: Aldo Leopold 1992, *Am Anfang war die Erde. Sand County Almanac. Plädoyer zur Umwelt-Ethik*, München).
- Martin M. Lintner 2017, *Der Mensch und das liebe Vieh. Ethische Fragen im Umgang mit Tieren, mit Beiträgen von Christoph J. Amor und Markus Moling*, Innsbruck.
- Wilfried Lochbühler 1996, *Christliche Umweltethik*, Frankfurt/ Main.
- Harvey Locke 2013, Nature needs half. A necessary and hopeful new agenda for protected areas, in: *Parks* 19, 9–18.

- Enzo Lodi 1998, La liturgie cosmique dans l'hymnologie de la liturgie Romaine des Heures, in: Achille M. Triacca/ Alessandro Pistoia (eds.) 1998, Liturgie et cosmos. Conférences saint-serge XLIV^e semaine d'études liturgiques Paris, 1–4 July 1997, Roma, 111–129.
- Karl Löning/ Erich Zenger 1997, Als Anfang schuf Gott. Biblische Schöpfungstheologien, Düsseldorf.
- Eva Lövbrand/ Silke Beck/ Jason Chilvers/ Tim Forsyth/ Johan Hedrén/ Mike Hulme/ Rolf Lidskog/ Eleftheria Vasileiadou 2015, Who speaks for the future of Earth? How critical social science can extend the conversation on the Anthropocene, in: *Global Environmental Change* 32, 211–218.
- Günther Lorenz 2013², Tiere im Leben der alten Kulturen. Schriftlose Kulturen, Alter Orient, Ägypten, Griechenland und Rom, Innsbruck.
- André Lossky 1998, Commémoration liturgique des séismes et confession de la toute-puissance divine, in: Achille M. Triacca/ Alessandro Pistoia (eds.), Liturgie et cosmos. Conférences saint-serge XLIV^e semaine d'études liturgiques Paris, 14 July 1997, Roma, 131–151.
- Thomas E. Lovejoy 1980, Changes in Biological Diversity, in: Gerald O. Barney (ed.), *The Global 2000 Report to the President. Entering The Twenty-First Century, Volume 2 – The technical report*, Harmondsworth, 327–333. <https://files.eric.ed.gov/fulltext/ED212523.pdf> (Retrieved 2.2.21).
- Gerhard Luf 1987, Menschenrechte III., in: *Staatslexikon* 3, 1107–1108.
- Liborius Lumma 2011, „Für alles, was lebt auf der Erde: die Pflanzen, die Tiere und die Menschen“. Das Gedenken der Schöpfung in östlicher, westlicher und ökumenischer Liturgie, in: Simone Paganini/ Johannes Panhofer (eds.), *Schöpfung – Evolution – Verantwortung. Vorträge der 11. Innsbrucker Theologischen Sommertage 2010*, Innsbruck, 217–235.
- Liborius Lumma 2017, Überhöhung, Wandlung, Ökologie. Die Schöpfung in der katholischen Sonntagsliturgie, in: *Heiliger Dienst* 71, 100–105.
- Theodor Maas-Ewerd 2000, „Ochs und Esel huldigten ihm“. Zwei Tiere an der Krippe des Herrn, in: Ders., „Schon leuchtet deine Krippe auf“. Die Feier der Geburt Jesu Christi und der weihnachtliche Festkreis in Liturgie und Brauchtum. St. Ottilien, 193–222.
- Hubert Markl 1992, *Die Fortschrittsdroge*, Zürich.
- Joan Martinez-Alier 2002, *The Environmentalism of the Poor. A Study of Ecological Conflicts and Valuation*, Cheltenham UK.
- Enrico Mazza 2004, *The Eucharistic Prayers of the Roman Rite*, Collegeville MN.
- Michael E. McCullough/ Robert A. Emmons/ Jo-Ann Tsang 2002, The grateful disposition. A conceptual and empirical topography, in: *Journal of Personality and Social Psychology* 83, 112–127.
- David C. McDuffie 2019, The Epic of Evolution and a Theology of Sacramental Ecology, in: *Religions* 10/ 244, 1–14.
- Sallie McFague 1993, *The Body of God. An Ecological Theology*, Minneapolis MN.
- Mary E. McGann 2012, Making Vital Connections: Developing Creational Consciousness in Life and Worship, in: *Liturgy* 27, 49–61.

- Peter McGrail 2016, Initiation and Ecology: Becoming a Christian in the Light of *Laudato si*, in: *Liturgy* 31, 55–62.
- Ralph N. McMichael 1993, The Redemption of Creation. A Liturgical Theology, in: Ralph N. McMichael (ed.), *Creation and liturgy*. In honor of H. Boone Porter, Washington DC, 145–160.
- Dennis L. Meadows 1972, Die Grenzen des Wachstums. Bericht des Club of Rome zur Lage der Menschheit, Stuttgart (englisch: Donella H. Meadows/ Dennis L. Meadows/ Joergen Randers/ William W. Behrens III 1972, *The Limits to Growth*. A Report for the Club of Rome's Project on the Predicament of Mankind, New York).
- Gary K. Meffe 1992, Techno-Arrogance and Halfway Technologies. Salmon Hatcheries on the Pacific Coast of North America, in *Conservation Biology* 6, 350–354.
- Toni Meier 2017, Planetary boundaries of agriculture and nutrition – an Anthropocene approach, in: *Proceedings of the Symposium on Communicating and Designing the Future of Food in the Anthropocene*. Humboldt University Berlin, 67–76. http://www.nutrition-impacts.org/media/2017_TMeyer_planetary_boundaries_agriculture_nutrition.pdf (Retrieved 12.9.20).
- Klaus Michael Meyer-Abich 1977, Zum Begriff einer praktischen Theologie der Natur, in: *Evangelische Theologie* 37, 3–20.
- Klaus Michael Meyer-Abich 1982, Vom bürgerlichen Rechtsstaat zur Rechtsgemeinschaft der Natur, in: *Scheidewege* 12, 581–605.
- Klaus Michael Meyer-Abich 1984, *Wege zum Frieden mit der Natur*. Praktische Naturphilosophie für die Umweltpolitik, München/ Wien.
- Klaus Michael Meyer-Abich 1987, Holismus – Philosophie der ökologischen Erneuerung, in: *Scheidewege* 17, 81–105.
- Andreas Michel 2015, Baum der Erkenntnis / Baum des Lebens, in: *Wissenschaftliches Bibellexikon*, <https://www.bibelwissenschaft.de/stichwort/14696/> (Retrieved 9.9.20).
- Margot Michel 2012, Die Würde der Kreatur und die Würde des Tieres im schweizerischen Recht. Eine Standortbestimmung anlässlich der bundesgerichtlichen Rechtsprechung, in: *Natur und Recht* 34, 102–109.
- Margaret Midgley 1984, *Animals and Why They Matter*, Athens GA.
- Dietmar Mieth 2009, Liturgie und Ethik. Der symboltheoretische Ansatz der Liturgiewissenschaft und der experientielle Ansatz der Theologischen Ethik im Gespräch, in: *Theologische Quartalschrift* 189, 94–105.
- Markus J. Milne 1996, On sustainability, the environment and management accounting, in: *Management Accounting Research* 7, 135–161.
- Walter Mischel/ Yuichi Shoda/ Monica L. Rodriguez 1989, Delay of gratification in children, in: *Science* 244, 933–938.
- Walter Mischel/ Ozlem Ayduk 2011², Willpower in a Cognitive-Affective Processing System. The dynamics of delay of gratification, in: Kathleen D. Vohs/ Roy F. Baumeister (Eds.), *Handbook of self-regulation*. Research, Theory, and Applications, New York, 83–105.

- Walter Mischel/ Ozlem Ayduk/ Marc G. Berman/ B. J. Casey/ Ian H. Gotlib/ John Jonides/ Ethan Kross/ Theresa Teslovich/ Nicole L. Wilson/ Vivian Zayas/ Yuichi Shoda 2011, "Willpower" over the life span. Decomposing self-regulation, in: *Social Cognitive and Affective Neuroscience* 6, 252–256.
- Walter Mischel 2015, *Der Marshmallow-Test. Willensstärke, Belohnungsaufschub und die Entwicklung der Persönlichkeit*, München.
- Terrie E. Moffitt/ Louise Arseneault/ Daniel Belsky/ Nigel Dickson/ Robert J. Hancox/ Hona Lee Harrington/ Renate Houts/ Richie Poulton/ Brent W. Roberts/ Stephen Ross/ Malcolm R. Searse/ W. Murray Thomson/ Avshalom Caspi 2011, A gradient of childhood self-control predicts health, wealth, and public safety, in: *Proceedings of the National Academy of Science* 108, 2693–2698.
- Ioan Moga 2017, Die „kosmische Liturgie“ in Zeiten der Umweltkrise. Momente ökologischen Bewusstseins in der orthodoxen Religiosität heute, in: *Heiliger Dienst* 71, 106–116.
- Jürgen Moltmann 1964, *Theologie der Hoffnung. Untersuchungen zur Begründung und zu den Konsequenzen einer christlichen Eschatologie*, München.
- Guido Montani 2007, The Ecocentric Approach to Sustainable Development. Ecology, Economics and Politics, in: *The Federalist* XLIX, 25–60.
- Jörg Müller 2017, Das Leben neu geschaffen. Das Ineinander von Schöpfung und Erlösung im Eucharistischen Hochgebet, in: *Heiliger Dienst* 71, 90–99.
- Johannes Müller 2016, Bevölkerungswachstum und nachhaltige Armutsbekämpfung, in: Markus Patenge/ Roman Beck/ Markus Luber (eds.), *Schöpfung bewahren: Theologie und Kirche als Impulsgeber für eine nachhaltige Entwicklung*, Regensburg, 45–63.
- Georg Müller-Christ 2020³, *Nachhaltiges Management: Über den Umgang mit Ressourcenorientierung und widersprüchlichen Managementrationalitäten. Handbuch für Studium und Praxis*, Baden-Baden.
- Hans J. Münk 1987, Umweltkrise – Folge und Erbe des Christentums?, in: *Jahrbuch für christliche Sozialwissenschaften* 28, 133–206.
- Hans J. Münk 1997, Die Würde des Menschen und die Würde der Natur, in: *Stimmen der Zeit* 215, 17–29.
- Hans J. Münk 1998, Nachhaltige Entwicklung und Soziallehre, in: *Stimmen der Zeit* 216, 231–245.
- Hans J. Münk 1999, Nachhaltige Entwicklung (sustainable development) als Leitbild der Technikgestaltung, in: *Ethica* 7, 173–195.
- Hans J. Münk 1999a, Bewahrung der Schöpfung als Grundauftrag einer nachhaltigen Entwicklung, in: Konrad Hilpert/ Gotthold Hasenhüttl (eds.), *Schöpfung und Selbstorganisation*, Paderborn, 226–242.
- Hans J. Münk 1999b, 'Starke' oder 'schwache' Nachhaltigkeit? Theologisch-ethische Überlegungen zur ökologischen Grundkomponente des Sustainability-Leitbilds, in: *Zeitschrift für Evangelische Ethik* 43, 277–293.
- Paul A. Murtaugh/ Michael G. Schlax 2009, Reproduction and the carbon legacies of individuals, in: *Global Environmental Change* 19, 14–20.

Bibliography

- Arne Næss 1973, *The Shallow and the Deep. Long-Range Ecology Movements: A Summary*, in: *Inquiry* 16, 95–100.
- Arne Næss 1990, *sustainable development and deep ecology*, in: J. Ronald Engel/ Joan G. Engel (eds.), *Ethics of Environment and Development. Global Challenge and International Response*, Tucson AR, 87–96.
- Arne Næss 1997, *sustainable development and the deep ecology movement*, in: Susan Baker/ Maria Kousis/ Stephen Young/ Dick Richardson (eds.), *The Politics of Sustainable Development: Theory, Policy and Practice Within the European Union*, New York, 59–69.
- Thomas Nagel 1974, *What is it like to be a bat?* In: *The Philosophical Review* LXXXIII, 435–450.
- Michael S. Northcott 1996, *The Environment and Christian Ethics*, Cambridge (UK)/ New York.
- Bryan G. Norton 1984, *Environmental Ethics and Weak Anthropocentrism*, in: *Environmental Ethics* 6, 131–148.
- Reed F. Noss 1990, *Indicators for monitoring biodiversity. A hierarchical approach*, in: *Conservation Biology* 4, 355–364.
- Reed F. Noss/ Allen Cooperrider 1994, *Saving Nature's Legacy. Protecting and Restoring Biodiversity*, Washington DC/ Covelo CA.
- Reed F. Noss et al. 2012, *Bolder thinking for conservation*, in: *Conservation Biology* 26, 1–4.
- Hans G. Nutzinger 1997, *Nachhaltige Wirtschaftsweise und menschlicher Fortschritt*, in: Hans Michael Baumgartner/ Winfried Böhm/ Martin Lindauer (eds.), *Fortschritt als Schicksal? Weder Verheißung noch Verhängnis?* Stuttgart u.a., 271–296.
- John O'Neill 1992, *The Varieties of Intrinsic Value*, in: *The Monist* 75, 119–137.
- William Ophuls 1973, *Leviathan or Oblivion*, in: Herman E. Daly (ed.), *Toward a Steady State Economy*, San Francisco, 215–230.
- Organisation for Economic Cooperation and Development (OECD) 2020, *How's Life? 2020: Measuring Well-being*, Paris.
- Elinor Ostrom 1990, *Governing the commons. The Evolution of Institutions for Collective Action*, Cambridge MS.
- Elinor Ostrom 1999, *Die Verfassung der Allmende. Jenseits von Staat und Markt*, Tübingen.
- Elinor Ostrom 2002, *The drama of the commons*, Washington DC.
- Elinor Ostrom 2009, *Building Trust to Solve Commons Dilemmas. Taking Small Steps to Test an Evolving Theory of Collective Action*, in: Simon A. Levin (ed.), *Games, Groups, and the Global Good*, Berlin/ Heidelberg, 207–228.
- Konrad Ott 1994, *Ökologie und Ethik. Ein Versuch praktischer Philosophie*, Tübingen.
- Konrad Ott 2010, *Umweltethik zur Einführung*, Hamburg.

- Konrad Ott 2016, Verantwortung im Anthropozän und Konzepte von Nachhaltigkeit, in: Markus Patenge/ Roman Beck/ Markus Luber (eds.), *Schöpfung bewahren: Theologie und Kirche als Impulsgeber für eine nachhaltige Entwicklung*, Regensburg, 64–103.
- Konrad Ott / Ralf Döring 2008, *Theorie und Praxis starker Nachhaltigkeit*, Marburg.
- Iлона M. Otto/ Jonathan F. Donges/ Roger Cremades/ Avit Bhowmik/ Richard J. Hewitt/ Wolfgang Lucht/ Johan Rockström/ Franziska Allerberger/ Mark McCaffrey/ Sylvanus S. P. Doe/ Alex Lenferna/ Nerea Morán/ Detlef P. van Vuuren/ Hans Joachim Schellnhuber 2020, Social tipping dynamics for stabilizing Earth's climate by 2050, in: *Proceedings of the National Academy of Science* 117, 2354–2365.
- Niko Paech 2005, Nachhaltigkeit zwischen Dematerialisierung und Ökologisierung: Hat sich die Wachstumsfrage erledigt?, in: *Natur und Kultur* 6/1, 52–72.
- Niko Paech 2008, Regionalwährungen als Bausteine einer Postwachstumsökonomie (PDF), in: *Zeitschrift für Sozialökonomie* 45/158–159, 10–19.
- Niko Paech 2009a, Die Postwachstumsökonomie – ein Vademecum (PDF), in: *Zeitschrift für Sozialökonomie* 46/160–161, 28–31.
- Niko Paech 2009b, Wachstum light? Qualitatives Wachstum ist eine Utopie (PDF), in: *Wissenschaft & Umwelt Interdisziplinär* 13, 84–93.
- Ecumenical Patriarchate 1989, Message by H.A.H. Ecumenical Patriarch Dimitrios upon the Day of Prayer for the Protection of Creation (01/09/1989), in: <https://www.patriarchate.org/-/message-by-h-a-h-ecumenical-patriarch-dimitrios-upon-the-day-of-prayer-for-the-protection-of-creation-01-09-1989-> (Retrieved: 11.11.20).
- David W. Pearce/ R. Kerry Turner 1990, *Economics of natural resources and the environment*, London.
- Linn Persson/ Bethanie M. Carney Almroth/ Christopher D. Collins/ Sarah Cornell/ Cynthia A. de Wit/ Miriam L. Diamond/ Peter Fantke/ Martin Hassellöv/ Matthew MacLeod/ Morten W. Ryberg/ Peter Søgaard Jørgensen/ Patricia Villarrubia-Gómez/ Zhanyun Wang/ Michael Zwicky Hauschild 2022, Outside the Safe Operating Space of the Planetary Boundary for Novel Entities, in: *Environmental Science & Technology* 56, 1510–1521.
- Dietmar von der Pfordten 2003, Tierwürde nach Analogie der Menschenwürde? In: Andreas Brenner (ed.), *Tiere beschreiben*, Erlangen, 105–123.
- Val Plumwood 1999, Being Prey, in: David Rothenberg/ Marta Ulvaeus (eds.), *The New Earth Reader: The Best of Terra Nova*, Cambridge MS, 76–91.
- Val Plumwood 2002, *Environmental Culture. The Ecological Crisis of Reason*, London.
- Val Plumwood 2012, *The Eye of the Crocodile*, Canberra.
- Karl Polanyi 1944, *The Great Transformation. The Political and Economic Origins of Our Time*, Boston MA.
- Anathea Portier-Young 2019, “Bless the Lord, Fire and Heat”. Reclaiming Daniel’s Cosmic Liturgy for Contemporary Eco-Justice, in: Teresa Berger (ed.), *Full of Your Glory. Liturgy, Cosmos, Creation*, Collegeville MS, 45–67.

- Amy R. Poteete/ Marco Janssen/ Elinor Ostrom 2010, Working together. Collective action, the commons, and multiple methods in practice, Princeton NJ.
- Ina Praetorius/ Peter Saladin 1996, Die Würde der Kreatur, Bern.
- Robert L. Pressey/ Richard M. Cowling/ Mathieu Rouget 2003, Formulating conservation targets for biodiversity pattern and process in the Cape Floristic Region, South Africa, in: *Biological Conservation* 112, 99–127.
- Fiona Probyn-Rapsey 2018, Anthropocentrism, in: Lori Gruen (ed.), *Critical Terms for Animal Studies*, Chicago, 47–63.
- Ben Purvis/ Yong Mao/ Darren Robinson 2019, Three pillars of sustainability. In search of conceptual origins, in: *Sustainability Science* 14, 681–695.
- Albert de Pury 1993, Gemeinschaft und Differenz. Aspekte der Mensch-Tier-Beziehung im alten Israel, in: Bernd Janowski/ Ute Neumann-Gorsolke/ Uwe Glessmer (eds.), *Gefährten und Feinde des Menschen. Das Tier in der Lebenswelt des alten Israel*, Neukirchen/ Vluyn, 112–154.
- Gavin Rae 2014, Anthropocentrism, in: *Encyclopedia of Global Bioethics*, 1–12.
- Hugo Rahner 1964, Ignatius von Loyola als Mensch und Theologe, Freiburg i.B.
- Karl Rahner 1967, Zur Theologie der Hoffnung in: Ders., *Schriften zur Theologie VIII*, Einsiedeln-Zürich-Köln, 561–579.
- Karl Rahner 1976, Grundkurs des Glaubens. Einführung in den Begriff des Christentums, Freiburg i.B.
- Paul Ramsey 1979, Liturgy and Ethics. Some New Beginnings, in: *The Journal of Religious Ethics* 7, 139–171.
- Simone Rappel 1996, Macht euch die Erde untertan. Die ökologische Krise als Folge des Christentums?, Paderborn.
- Rat der Evangelischen Kirche in Deutschland/ Deutsche Bischofskonferenz 1997, Für eine Zukunft in Solidarität und Gerechtigkeit. Wort zur wirtschaftlichen und sozialen Lage in Deutschland, Bonn/ Hannover.
- John Rawls 1955, Two Concepts of Rules, in: *The Philosophical Review* 64,3–32 (deutsch in: Otfried Höffe (ed.) ²1992, Einführung in die utilitaristische Ethik, Tübingen, 135–166).
- John Rawls 1975, Eine Theorie der Gerechtigkeit, Frankfurt/ Main.
- Tom Regan 2004⁴, *The Case for Animal Rights*, Berkeley/ Los Angeles.
- Friedo Ricken 1987, Anthropozentrismus oder Biozentrismus? Begründungsprobleme der ökologischen Ethik: Theologie und Philosophie 62, 1–21.
- Peter Riede 2010, Tier, in: *Wissenschaftliches Bibellexikon*, <https://www.bibelwissenschaft.de/stichwort/35794/> (Retrieved 7.9.20).
- William J. Ripple/ Christopher Wolf/ Thomas M. Newsome/ Mauro Galetti/ Mohammed Alamgir/ Eileen Crist/ Mahmoud I. Mahmoud/ William F. Laurance 2017, World scientists' warning to humanity. A second notice, in: *BioScience* 67, 1026–1028.
- Timothy Robinson 2020, Reimagining Christian Hope(lessness) in the Anthropocene, in: *Religions* 11, 192, 1–11.

- Johan Rockström/ Will Steffen/ Kevin Noone/ Åsa Persson/ F. Stuart III Chapin/ Eric Lambin/ Timothy M. Lenton/ Marten Scheffer/ Carl Folke/ Hans Joachim Schellnhuber/ Björn Nykvist/ Cynthia A. de Wit/ Terry Hughes/ Sander van der Leeuw/ Henning Rodhe/ Sverker Sörlin/ Peter K. Snyder/ Robert Costanza/ Uno Svedin/ Malin Falkenmark/ Louise Karlberg/ Robert W. Corell/ Victoria J. Fabry/ James Hansen/ Brian Walker/ Diana Liverman/ Katherine Richardson/ Paul Crutzen/ Jonathan Foley 2009a, Planetary Boundaries. Exploring the Safe Operating Space for Humanity, in: *Ecology and Society* 14 (2), Issue 32. <https://science.sciencemag.org/content/347/6223/1259855> (Retrieved 1.2.21).
- Johan Rockström/ Will Steffen/ Kevin Noone/ Åsa Persson/ F. Stuart III Chapin/ Eric Lambin/ Timothy M. Lenton/ Marten Scheffer/ Carl Folke/ Hans Joachim Schellnhuber/ Björn Nykvist/ Cynthia A. de Wit/ Terry Hughes/ Sander van der Leeuw/ Henning Rodhe/ Sverker Sörlin/ Peter K. Snyder/ Robert Costanza/ Uno Svedin/ Malin Falkenmark/ Louise Karlberg/ Robert W. Corell/ Victoria J. Fabry/ James Hansen/ Brian Walker/ Diana Liverman/ Katherine Richardson/ Paul Crutzen/ Jonathan Foley 2009b, A safe operating space for humanity. Identifying and quantifying planetary boundaries that must not be transgressed could help prevent human activities from causing unacceptable environmental change, in: *Nature* 461, 472–475. <https://www.nature.com/articles/461472a.pdf> (Retrieved 1.2.21).
- Monica L. Rodriguez/ Walter Mischel/ Yuichi Shoda 1989, Cognitive person variables in the delay of gratification of older children at risk, in: *Journal of Personality and Social Psychology* 57, 358–367.
- Holmes Rolston 1988, *Environmental Ethics. Duties to and Values in the Natural World*, Philadelphia.
- Holmes Rolston 2011, *A new environmental ethics. The next millennium for life on earth*, New York.
- Hartmut Rosenau 1993, Das „Seufzen“ der Kreatur – das Problem der Anthropozentrik in einer Theologie der Natur, in: *Neue Zeitschrift für Systematische Theologie und Religionsphilosophie* 35, 57–70.
- Michael Rosenberger 2001, *Was dem Leben dient*, Stuttgart.
- Michael Rosenberger 2001a, *Im Zeichen des Lebensbaums. Ein theologisches Lexikon der christlichen Schöpfungsspiritualität*, Würzburg.
- Michael Rosenberger 2008, „Waid-Gerechtigkeit“. Grundzüge einer christlichen Ethik der Jagd, in: *Lehr- und Forschungsanstalt für Land- und Forstwirtschaft* (ed.), *Jagd und Jäger im Visier – Perspektiven für die Freizeitjagd in unserer Gesellschaft*, Irdning 2008, 5–14.
- Michael Rosenberger 2012, *Im Geheimnis geborgen. Einführung in die Theologie des Gebets*, Würzburg.
- Michael Rosenberger 2013, „Die Zeit, alle zu verderben, die die Erde verderben“ (Offb 11,18). Klimaschutz als apokalyptisches Programm, in: *Theologisch-praktische Quartalschrift* 161, 58–68.
- Michael Rosenberger 2013a, Das Apfelbäumchen pflanzen. Theologische Wahrnehmungen der gegenwärtigen Klimadebatte, in: *Stimmen der Zeit* 231, 339–349.

Bibliography

- Michael Rosenberger 2014, *Im Brot der Erde den Himmel schmecken. Ethik und Spiritualität der Ernährung*, München.
- Michael Rosenberger 2016, Eine eindringliche Mahnung. Die Enzyklika "Laudato si'" im Kontext apokalyptischer Bilder, in: *Polonia Sacra* 20/ 3 (44), 5–22.
- Michael Rosenberger 2018, Über individuelle ethische Denkformen hinaus. (Tier-)Gerechtigkeit im Spannungsfeld individualistischer und systemischer Begründungen, in: *Tierstudien* 13, 124–135.
- Michael Rosenberger 2018a, Diesseits und jenseits der Nützlichkeit. Theologisch-ethische Überlegungen zur Bedeutung von Biodiversität im Wald, in: Michael Rosenberger/ Norbert Weigl (eds.), *Forstwirtschaft und Biodiversität. Interdisziplinäre Zugänge zu einem Brennpunkt nachhaltiger Entwicklung*, München, 213–224.
- Michael Rosenberger 2019, Sich den Wert des Tieres vor Augen halten. Das rituelle Schlachten und der Tierschutz, in: *Dialog* 22–8, 117–170.
- Michael Rosenberger 2021, *Was der Seele Leben schenkt. Spiritualität aus Erde*, Würzburg.
- Karlheinz Ruhstorfer 2012, *Systematische Theologie Modul 3*, Paderborn.
- Francisco Sánchez-Bayo/ Kris A.G. Wyckhuys 2019, Worldwide decline of the entomofauna: A review of its drivers, in: *Biological Conservation* 232, 8–27.
- Gloria L. Schaab 2011, Environment, Ecology, and Creation Theology. Visions and Revisions in the Christian Tradition, in: *Liturgical Ministry* 20, 57–67.
- Rudolf Schnackenburg 1981, *Das Johannes-Evangelium Bd. 1*, Freiburg i.B.
- Michael Schneider 2017, Liturgie und Schöpfung. Ein Beitrag aus ostkirchlicher Sicht, in: *Heiliger Dienst* 71, 117–125.
- Eberhard Schockenhoff 1993, Maß, in: Nikolaus Kutschki (ed.), *Kardinaltugenden. Alte Lebensmaximen neu gesehen*, Würzburg, 41–50.
- Isolde Schönstein/ Lukas Vischer (ed.) 2006, *Eine Zeit für Gottes Schöpfung*. Genf.
- Michael Schramm 1991, *Prozestheologie und Bioethik. Reproduktionsmedizin und Gentechnik im Lichte der Philosophie A.N. Whiteheads*, Freiburg i.Ue./ Freiburg i.B.
- Michael Schramm 1994, *Asthetische Mystik der Natur. Schöpfungsethische Perspektiven*, in: Michael Schramm/ Udo Zelinka (eds.), *Um des Menschen willen. Moral und Spiritualität*, Würzburg.
- Michael Schramm 1995, *Der Geldwert der Schöpfung. Theologie – Ökologie – Ökonomie*, Paderborn/ München/ Wien/ Zürich.
- Silvia Schroer 1988, *Lebensbaum*, in: *Neues Bibel-Lexikon* 602–603.
- Albert Schweitzer 1966, *Die Ehrfurcht vor dem Leben. Grundtexte aus fünf Jahrzehnten*, München.
- Albert Schweitzer 1970, *Die Entstehung der Lehre der Ehrfurcht vor dem Leben und ihre Bedeutung für unsere Kultur*, in: *Gesammelte Werke in 5 Bänden, Band 5*, München, 172–191.

- Albert Schweitzer 2017, Morgenpredigt Sonntag, 16. Februar 1919, St. Nicolai, 1. Predigt über ethische Probleme, Mk. 12,24–38: Das große Gebot, in: Ders., Predigten 1898-1948, München, 1233–1239.
- Roy Scranton 2015, Learning to Die in the Anthropocene. Reflections on the End of a Civilization, San Francisco.
- Deborah Sengl 2012, Via dolorosa, in: www.deborahsengl.com/via-dolorosa/ (Retrieved: 22.7.20).
- W.R. Derrick Sewell 1969, Rezension J. H. Dales: Pollution, property and prices, in: Canadian Journal of Political Science/ Revue canadienne de science politique 2, 386–387.
- Steven Sherwood/ Mark J. Webb/ Kyle Armour/ Piers Forster/ Gabriele Hegerl/ Stephen A. Klein/ Eelco J. Rohling/ Masahiro Watanabe/ Timothy Andrews/ Pascale Braconnot/ Christopher S. Bretherton/ Gavin Lee Foster/ Zeke Hausfather/ Anna S. von der Heydt/ Reto Knutti/ Thorsten Mauritsen/ Cristian Proistosescu/ Maria A.A. Rugenstein/ Gavin A. Schmidt/ Katarzyna B. Tokarska/ Mark D. Zelinka 2020, An assessment of Earth's climate sensitivity using multiple lines of evidence, in: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2019RG000678> (Retrieved 1.2.21).
- Robert Shore-Goss 2016, God Is Green. An Eco-spirituality of Incarnate Compassion, Eugene OR.
- Peter Singer (ed.) 1986, Verteidigt die Tiere, Wien.
- Peter Singer 1994², Praktische Ethik, Stuttgart.
- Robert J. Smith 1981, Resolving the Tragedy of the Commons by Creating Private Property Rights in Wildlife, in: CATO Journal 1, 439–468.
- Will Steffen/ Katherine Richardson/ Johan Rockström/ Sarah E. Cornell/ Ingo Fetzer/ Elena M. Bennett/ Reinette Biggs/ Stephen R. Carpenter/ Wim de Vries/ Cynthia A. de Wit/ Carl Folke/ Dieter Gerten/ Jens Heinke/ Georgina M. Mace/ Linn M. Persson/ Veerabhadran Ramanathan/ Belinda Reyers/ Sverker Sörlin 2015, Planetary boundaries: Guiding human development on a changing planet, in: Science 347, Issue 6223. <https://science.sciencemag.org/content/347/6223/1259855> (Retrieved 1.2.21).
- Will Steffen/ Wendy Broadgate/ Lisa Deutsch/ Owen Gaffney/ Cornelia Ludwig 2015a, The trajectory of the Anthropocene: The Great Acceleration. 2015 Anthropocene Review, in: International Geosphere-Biosphere Programme, <http://www.igbp.net/globalchange/greatacceleration.4.1b8ae20512db692f2a680001630.htm> (Retrieved 1.2.21).
- James P. Sterba 1995, From biocentric individualism to biocentric pluralism, in: Environmental Ethics 17, 191–207.
- James P. Sterba 1998, A Biocentrist Strikes Back, in: Environmental Ethics 20, 361–376.
- James P. Sterba 2005, Kantians and Utilitarians and the Moral Status of Nonhuman Life, in: James P. Sterba, The Triumph of Practice Over Theory in Ethics, Oxford and New York, 58–73.

Bibliography

- James P. Sterba 2011, Biocentrism Defended, in: *Ethics, Policy and Environment* 14, 167–169.
- Benjamin M. Stewart 2011, *A Watered Garden. Christian Worship and Earth Ecology*, *Worship Matters*, Minneapolis MN.
- Benjamin M. Stewart 2012, Committed to the Earth. Ecotheological Dimensions of Christian Burial Practices, in: *Liturgy* 27, 62–72.
- Benjamin M. Stewart 2019, Wisdom's Buried Treasure. Ecological Cosmology in Funeral Rites, in: Teresa Berger (ed.), *Full of Your Glory. Liturgy, Cosmos, Creation*, Collegetown MN, 353–376.
- Stockholm Resilience Centre o.J., The nine planetary boundaries, in: <https://www.stockholmresilience.org/research/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html> (Retrieved 1.2.21).
- Saskia Stucki 2016, Grundrechte für Tiere? Eine Kritik des geltenden Tierschutzrechts und rechtstheoretische Grundlegung von Tierrechten im Rahmen einer Neupositionierung des Tieres als Rechtssubjekt, Baden-Baden.
- Matthias Sutter/ Martin G. Kocher/ Daniela Glätzle-Rüetzler/ Stefan T. Trautmann 2013, Impatience and Uncertainty. Experimental Decisions Predict Adolescents' Field Behavior, in: *American Economic Review* 103, 510–531.
- Matthias Sutter/ Silvia Angerer/ Daniela Glätzle-Rüetzler/ Philipp Lergetporer 2015, Donations, Risk Attitudes and Time Preferences. A Study on Altruism in Primary School Children, in: *Journal of Economic Behavior and Organization* 115, 67–74, <http://ftp.iza.org/dp8020.pdf> (Retrieved 15.2.21).
- Matthias Sutter 2014, *Die Entdeckung der Geduld – Ausdauer schlägt Talent*, Salzburg.
- Thomas J. Talley 1993, The Creation Theme in Eucharistic Prayer, in: Ralph N. McMichael (ed.), *Creation and liturgy. In honor of H. Boone Porter*, Washington DC, 13–27.
- Bron Taylor 2020, *Dunkelgrüne Religion. Naturspiritualität und die Zukunft des Planeten*, Paderborn (engl. Original 2010, *Dark green religion. Nature spirituality and the planetary future*, Berkeley CA).
- Bron Taylor/ Gretel Van Wieren/ Bernard Daley Zaleha 2016, Lynn White Jr. and the greening-of-religion hypothesis, in: *Conservation Biology* 30, 1000–1009.
- Bron Taylor/ Guillaume Chapron/ Helen Kopnina/ Ewa Orlikowska/ Joe Gray/ John J. Piccolo 2020, The need for ecocentrism in biodiversity conservation, in: *Conservation Biology* 34, 1089–1096.
- Paul W. Taylor 1981, The Ethics of Respect for Nature, in: *Environmental Ethics* 3, 197–218.
- Paul W. Taylor 1983, In Defense of Biocentrism, in: *Environmental Ethics* 5, 237–243.
- Paul W. Taylor 1984, Are Humans Superior to Animals and Plants? in: *Environmental Ethics* 6, 149–160.
- Paul W. Taylor 1986/ 2011, *Respect for Nature. A Theory of Environmental Ethics*, Princeton NJ.

- The Economics of Ecosystems and Biodiversity (TEEB) 2010, Die Ökonomie von Ökosystemen und Biodiversität: Die ökonomische Bedeutung der Natur in Entscheidungsprozesse integrieren. Ansatz, Schlussfolgerungen und Empfehlungen von TEEB – eine Synthese, Münster.
- Gotthard M. Teutsch 1985, Lexikon der Umweltethik, Göttingen/ Düsseldorf.
- Gotthard M. Teutsch 1987, Mensch und Tier. Lexikon der Tierschutzethik, Göttingen.
- Gotthard M. Teutsch 1995, Die „Würde der Kreatur“. Erläuterungen zu einem neuen Verfassungsbegriff am Beispiel des Tieres, Bern.
- Paul B. Thompson 2017², The spirit of the soil: agriculture and environmental ethics, New York.
- Greta Thunberg 2019, Davos Speech, in: The Guardian 25.1.2019, Manuscript and video: <https://www.theguardian.com/environment/2019/jan/25/our-house-is-on-fire-greta-thunberg16-urges-leaders-to-act-on-climate> (Retrieved 18.2.21).
- Jo-Ann Tsang 2006, Gratitude and prosocial behaviour. An experimental test of gratitude, in: Cognition and Emotion 20, 138–148.
- Union Evangelischer Kirchen in der Evangelischen Kirche in Deutschland (UEK)/ Vereinigte Evangelisch-Lutherische Kirche Deutschlands (VELKD) 2018, Die Taufe. Entwurf zur Erprobung. Taufbuch für die Union Evangelischer Kirchen in der EKD. Agende III, Teilband 1 der VELKD für evangelisch-lutherische Kirchen und Gemeinden, in: https://www.velkd.de/downloads/taufe-entwurf-zu-r-erprobung-uek-velkd_2018.pdf (Retrieved 20.11.20).
- Deutsches Umweltbundesamt 2016, Umweltschädliche Subventionen in Deutschland. Aktualisierte Ausgabe 2016, Dessau-Roßlau.
- United Nations 1987, Report of the World Commission on Environment and Development Our Common Future, New York.
- United Nations 1992, Convention on Biological Diversity, in: <https://www.cbd.int/doc/legal/cbd-en.pdf> (Retrieved 15.9.20).
- UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC)/ International Union for Conservation of Nature (IUCN) 2016, Protected Plan Report 2016, Cambridge UK.
- Andrea Vicini 2016, Anthropocentric, Theocentric, Biocentric, and Cosmocentric. Ecotheological Visions in Tension, in: Markus Patenge/ Roman Beck/ Markus Lubert (eds.), Schöpfung bewahren: Theologie und Kirche als Impulsgeber für eine nachhaltige Entwicklung, Regensburg, 164–188.
- Markus Vogt o.J., Das Prinzip Nachhaltigkeit und seine Umsetzung in Deutschland, in: https://ordosocialis.de/pdf/M.Vogt/Das_Prinzip_Nachhaltigkeit-de.pdf (8.1.21).
- Markus Vogt 2009, Prinzip Nachhaltigkeit. Ein Entwurf aus theologisch-ethischer Perspektive, München.
- Markus Vogt 2014, Carlowitz weiterdenken. Nachhaltigkeit als Basis für eine „Große Transformation“ heute. Vortrag zum 300. Todestag von Hans Carl von Carlowitz, in: Dieter Füsslein (ed.), Menschen gestalten Nachhaltigkeit. Carlowitz weiterdenken, München, 91–121.

- Markus Vogt 2014a, Nachhaltigkeit aus theologisch-ethischer Perspektive, in: Michael von Hauff (ed.), *Nachhaltige Entwicklung. Aus der Perspektive verschiedener Disziplinen*, Baden-Baden, 218–235.
- Markus Vogt 2016, Nachhaltigkeit als neues Sozialprinzip christlicher Ethik, in: Markus Patenge/ Roman Beck/ Markus Lubert (eds.), *Schöpfung bewahren: Theologie und Kirche als Impulsgeber für eine nachhaltige Entwicklung*, Regensburg, 128–149.
- Markus Vogt 2018, Gottesperspektiven im Nachhaltigkeitsdiskurs, in: Brigitte Bertelmann/ Klaus Heidel (eds.), *Leben im Anthropozän. Christliche Perspektiven für eine Kultur der Nachhaltigkeit*, München, 247–258.
- Markus Vogt 2020, Nachhaltigkeit, sozialetisch, in: *Staatslexikon*, 8. Aufl., Bd. 4, 135–141.
- Klaus Vondung 1988, *Die Apokalypse in Deutschland*, München.
- Jurriaan M. de Vos/ Lucas N. Joppa/ John L. Gittleman/ Patrick R. Stephens/ Stuart L. Pimm 2014, Estimating the normal background rate of species extinction, in: *Conservation Biology* 29, 452–462.
- Haydn Washington/ Bron Taylor/ Helen Kopnina/ Paul Cryer/ John J. Piccolo 2017, Why ecocentrism is the key pathway to sustainability, in: *The Ecological Citizen* 1, 35–41.
- James E.M. Watson/ Oscar Venter 2017, A global plan for nature conservation, in: *Nature* 550, 48–49.
- James E.M. Watson/ Oscar Venter/ Jasmine Lee/ Kendall R. Jones/ John G. Robinson/ Hugh P. Possingham/ James R. Allan 2018, Protect the last of the wild. Global conservation policy must stop the disappearance of Earth's few intact ecosystems, in: *Nature* 563, 27–30.
- Nick Watts/ Markus Amann/ Nigel Arnell/ Sonja Ayeb-Karlsson/ Kristine Belesova/ Maxwell Boykoff/ Peter Byass/ Wenjia Cai/ Diarmid Campbell-Lendrum/ Stuart Capstick/ Jonathan Chambers/ Carole Dalin/ Meaghan Daly/ Niheer Dasandi/ Michael Davies/ Paul Drummond/ Robert Dubrow/ Kristie L Ebi/ Matthew Eckelman/ Paul Ekins/ Luis E Escobar/ Lucia Fernandez Montoya/ Lucien Georgeson/ Hilary Graham/ Paul Haggard/ Ian Hamilton/ Stella Hartinger/ Jeremy Hess/ Ilan Kelman/ Gregor Kiesewetter/ Tord Kjellstrom/ Dominic Kniveton/ Bruno Lemke/ Yang Liu/ Melissa Lott/ Rachel Lowe/ Maquins Odhiambo Sewe/ Jaime Martinez-Urtaza/ Mark Maslin/ Lucy McAllister/ Alice McGushin/ Slava Jankin Mikhaylov/ James Milner/ Maziar Moradi-Lakeh/ Karyn Morrissey/ Kris Murray/ Simon Munzert/ Maria Nilsson/ Tara Neville/ Tadj Oreszczyn/ Fereidoon Owfi/ Olivia Pearn/ David Pencheon/ Dung Phung/ Steve Pye/ Ruth Quinn/ Mahnaz Rabbaniha/ Elizabeth Robinson/ Joacim Rocklöv/ Jan C Semenza/ Jodi Sherman/ Joy Shumake-Guillemot/ Meisam Tabatabaei/ Jonathon Taylor/ Joaquin Trinanes/ Paul Wilkinson/ Anthony Costello/ Peng Gong/ Hugh Montgomery 2019, The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate, in: *Lancet* 394, 1836–1878.

- Carl Christian von Weizsäcker 2011, Vorsicht vor dem „gestaltenden Staat“! Reaktion auf R. Schubert et al. 2011. Klar zur Wende! Warum eine „Große Transformation“ notwendig ist. *GAIA* 20/4: 243 – 245, in: *GAIA* 20, 246–247.
- Lynn White 1967, The Historical Roots of the Ecological Crisis, in: *Science* 155, 1203–1207.
- Lynn White 1973, The Historical Roots of the Ecological Crisis. Continuing the Conversation, in: Ian G. Barbour, *Western Man and Environmental Ethics*, Boston, 18–30.
- Edward O. Wilson 2003, *The Future of Life*, New York.
- Edward O. Wilson 2006, *Naturalist*, Washington.
- Edward O. Wilson 2016, *Half-earth. Our planet's fight for life*, New York.
- Ricarda Winkelmann/ Anders Levermann/ Andy Ridgwell/ Ken Caldeira 2015, Combustion of available fossil fuel resources sufficient to eliminate the Antarctic Ice Sheet, in: *Science Advances* 1, e1500589, <http://advances.sciencemag.org/content/1/8/e1500589> (13.6.16).
- Urs Winter 1986, Der stilisierte Lebensbaum, in *Bibel und Kirche* 41, 171–177.
- Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (WBGU) 2011, *Hauptgutachten Welt im Wandel. Gesellschaftsvertrag für eine Große Transformation*, Berlin.
- Rüdiger Wittig/ Manfred Niekisch 2014, *Biodiversität: Grundlagen, Gefährdung, Schutz*, Berlin/ Heidelberg.
- Werner Wolbert 1987, *Der Mensch als Mittel und Zweck. Die Idee der Menschenwürde in normativer Ethik und Metaethik*, Münster.
- Michael Wolter 2014, *Der Brief an die Römer Band I: Röm 1-8*, Neukirchen-Vluyn.
- Alex M. Wood/ Stephen Joseph/ John Maltby 2008, Gratitude uniquely predicts satisfaction with life: Incremental validity above the domains and facets of the Five Factor Model, in: *Personality and Individual Differences* 45, 49–54.
- Alex M. Wood/ Stephen Joseph/ John Maltby 2009, Gratitude predicts psychological well-being above the Big Five facets, in: *Personality and Individual Differences* 45, 655–660.
- Seth Wynes/ Kimberly A. Nicholas 2017, The climate mitigation gap. Education and government recommendations miss the most effective individual actions, in: *Environmental Research Letters* 12, 1–9.
- Erich Zenger 1983, *Gottes Bogen in den Wolken*, Stuttgart.
- Erich Zenger 1989, „Du liebst alles, was ist“ (Weish 11,24). Biblische Perspektiven für einen erneuerten Umgang mit der Schöpfung, in: *Bibel und Kirche* 44, 138–147.
- Erich Zenger 1995, *Einleitung in das Alte Testament*, Stuttgart.
- Joseph Ziegler 1952, Ochs und Esel an der Krippe. Biblisch-patristische Erwägungen zu Is 1,3 und Hab 3,2 (LXX), in: *Münchener Theologische Zeitschrift* 3/4, 385–402.
- Valentin Zsifkovits 2012, *Orientierungen für eine humane Welt*, Wien / Berlin.

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